EASY – PLAIN – ACCESSIBLE

Christiane Maaß / Isabel Rink (eds.)

Handbook of Accessible Communication

Frank & Timme

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Silvia Hansen-Schirra / Christiane Maaß (eds.)
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Introduction and overview

Christiane Maaß and Isabel Rink

Preface

Dear Readers,

Until recently, Accessible Communication was neither a clearly defined professional profile nor a distinct area of research. However, political and legal endeavours at the international and national level to establish accessibility for all people have led to a situation in which both professionalisation and academisation have become a necessity (see for example the European Accessibility Act and Directive 2016/2102 of the European Parliament and of the Council on the accessibility of websites and mobile applications of public sector bodies, to name just two). In reaction to this situation, we founded the Master's Programme Accessible Communication at the University of Hildesheim (Maaß/Rink/Ahrens 2022) in 2018, where we compiled the state of research in the individual research disciplines that, in combination, constitute the basis of current research on Accessible Communication. These developments subsequently resulted in the creation of the German "Handbuch Barrierefreie Kommunikation" (Maaß/Rink 2019a, online edition 2020), which has laid the foundations for Accessible Communication as a joint field of research in Germany and beyond.

The Handbook of Accessible Communication is a **translation** of the original German "Handbuch Barrierefreie Kommunikation" and reflects the state of research in Germany in 2018. In Germany and elsewhere, the German version has served as the status quo and basis for further research. We opted for translations of the articles rather than inviting the authors to rewrite them in English in order to facilitate reference to the manual in both languages.

During the past few years, international research exchange and cooperation in the field has intensified greatly, which is noticeable, for example, in a number

of pertinent international conferences like the Klaaranetwork Conferences in Helsinki (Finnland) and Olten (Switzerland), the International Easy Language Day Conferences in Mainz/Germersheim (Germany), Moscow (Russia) and Budapest (Hungary), as well as the Swiss Conferences on Barrier-free Communication at the University of Winterthur and several Conferences on Accessible Communication at the University of Hildesheim. These conferences themselves were held in inclusive formats to make them accessible for participants and audiences with diverse communicative needs (e.g. sign languages and speech-to-text interpreting, audiodescription, FM systems for the hard of hearing, Easy Language translation and interpreting, subtitles in various languages, printed conference materials in Easy Language). People with and without impairments took part in various roles as participants, speakers, co-researchers, etc. This new state of the art that led to insights and exchange beyond the common practice in scientific discourse.

As a further step towards closer collaboration in the scientific community, an international research platform "Easy – Plain – Accessible" was released in May 2021 (www.easy-plain-accessible.com), as well as an international book series of the same name (Hansen-Schirra/Maaß eds., 2020–) that also hosts the present Handbook.

We are currently in a highly dynamic research situation with first results from empirical studies that were partly described as desiderata in the Handbook. One of the results that we deem most significant is the insight into the importance of the factor **acceptability** for any kind of accessible communication (see for example Rink 2020, Maaß 2020, Lang 2021). While research and practice have mainly focussed on perceptibility and comprehensibility, it has become obvious that acceptability has been widely underrated as a decisive factor for successful communicative interaction. Therefore, we have modified the Hildesheim school's accessible communication model that you find in the following introduction in its previous form. It is complemented to include acceptability as a text quality and acceptance as a user action:

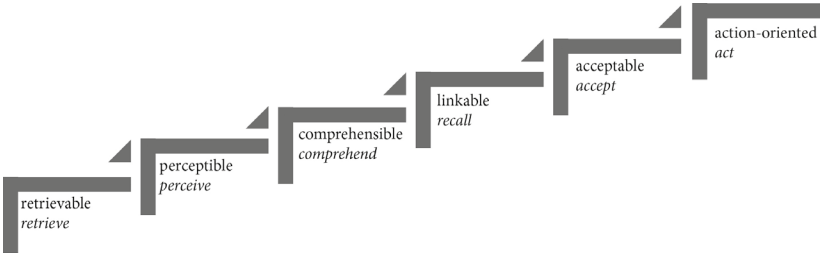

Figure 1: Steps towards accessibility (Hildesheim school's accessible communication model according to Maaß 2020)

We now conceive the single steps as a flight of stairs where text quality and user action correspond on each step: Information has to be retrievable to facilitate retrieval, perceptible in order to facilitate perception, comprehensible to be understood, linkable to previous knowledge to facilitate recall, acceptable as a precondition for acceptance and action oriented to facilitate action (Maaß/Rink 2019b). These actions can be impeded on each step by barriers that are innate in the communication offer or situation. The communication barriers (see Rink, in this volume) therefore match the various steps of the overall comprehension process (see Christmann/Groeben, in this volume) and were complemented by Lang (2021) who adds a motivational and an emotional barrier on the level of acceptability:

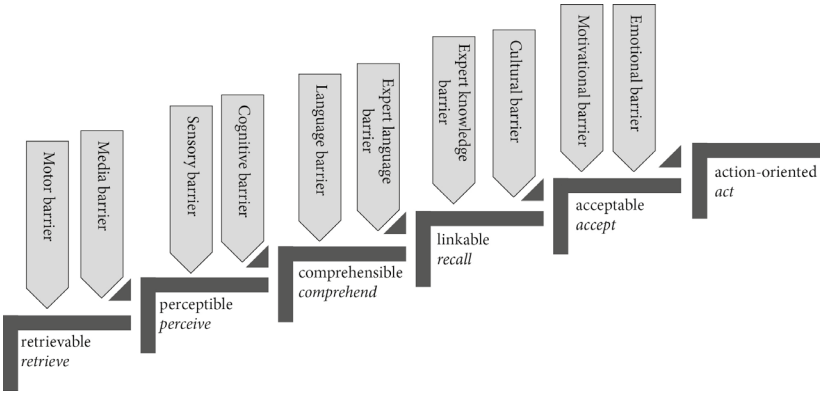

Figure 2: Hildesheim school's accessible communication model with corresponding communication barriers, based on Maaß/Rink 2019 and Maaß 2020)

Accessible communication research is directed towards identifying communication barriers in various communicative situations and for people with different kinds of communicative needs.

After the publication of the first German Handbook of Accessible Communication, we received multiple international requests for an English version, and we are glad to hereby present it to you.

The translation was realised as a close collaboration project between the translation departments of the Johannes Gutenberg University Mainz in Germersheim and the University of Hildesheim. It was accompanied by extensive terminology work that partly had to conceive new terms or collect them from a multitude of contexts. The outcome of this terminology work is presented in The Dictionary of Accessible Communication (Hansen-Schirra/Abels/Signer/Maaß 2021). The translation process is minutely described in Part I of this dictionary so that we limit the following report to some basic remarks and a list of the researchers and students that were part of the project.

The responsible persons implemented this mammoth task in a classroom-based translation bureau setting containing several work steps, seminars and students on both sites, Germersheim and Hildesheim (Hansen-Schirra et al. 2021: 16). In order to achieve a precise, consistent and high-quality translation the following six steps were prerequisites for a successful outcome (Hansen-Schirra et al. 2021: 17):

1. Extraction of terminology and accompanying terminology management
2. Translation of articles
3. Peer-review of articles
4. Consistency check (of terminology, style, etc.)
5. Revision of articles
6. Final quality control

The translation, revision and terminology teams were led by Katja Abels and Sarah Signer. On the Hildesheim side, Ezekiel Anumba co-ordinated the translation and terminology work. Terminology management was accompanied by

two MA theses by Luise Ebert and Angelika Wallenstein. For further details on the project's terminology management see Ebert (2020) and Wallenstein (2020). Quality assurance was finalised by Sarah Signer, Silvana Deilen and Rebecca Schulz. The following students from Germersheim and Hildesheim acted in the role of translators, revisers and terminologists (in alphabetical order):

Julia Abdi, Sarah Afflerbach, Luisa Aiglstorfer, Teresa Altmann, Ella-Sophie Assbrock, Valerija Augustinovic, Anastasia Bachortschuk, Katharina Bahrs, Daniel Nicholas Jr. Ballestin, Verena Bauer, Veronika Laura Becker, Sarina Beier, Nicola Boes, Kevin Scott Bongard, Jessica Bras Farinho, Franziska Braun, Laura Bruder, Maike Brunsch, Tetiana Bunchuk, Katrin Busse, Anna Busygina, Friederike Beatrice Castellet, Sude Asenna Demirhisar, Shana Diekmann, Olga Dill, Tamara Dominguez Ebitsch, Luise Ebert, Isabel Ehms, Rebecka Endl, Milena España Provenzano, Johanna Lisa Eufinger, Vanessa Finkler, Brenda Antonella Finocchiaro, Kora Fischer, Kristin Fischer, Jonas Benjamin Flaig, Sophia Foaleng, Andreana Foka, Leana Marie Fölling, Franziska Fröhlich, Zoe Marlen Gaertner, Inès Gill, Michelle Glück, Paul Frederic Grebe, Dennis Günschmann, Laura Susan Hampe, Nathan Hayduk, Christine Heidrich, Martha Maria Heuts, Simona Melinda Hildebrand, Elisa Hinz, Corinna Marianne Hinze, Luise Hoffmann, Eric Fabian Hoffmann, Eva Hogrefe, Rahel Hoppe, Franziska Judith Hör, Andreas Paul Huber, Leonie Immerz, Ann-Sophie Jarcho, Rebecca Jung, Emely Sophie Kaiser, Alicia Kaleja, Sonja Anna Kara, Alexandra Kiourtsi, Claudia Kirchner-Thimm, Lea Anne Kissel, Patrycja Malgorzata Klama, Anne Charlotte Klehr, Desiree Klein, Lydia Kleinstück, Elina Koba, Agnieszka Kowalik, Pia Krause, Katrin Krinke, Melina Cornelia Küchle, Anika Franziska Kulisch, Inga Kusbach, Veronika Antonella Lange, Lisa Langkabel, Maximilian Last, Andrea Letkemann, Beatrice Lipani, Annika Marleen Löffler, Rocca Loiacono, Eleni Lorenzen, Christopher Mastronardo, Charline Mathis, Minou Kashani Moghadam, Laura Naldi, Kamila Nalewaj, Waldemar Nazarov, Natali Neiland, Melissa-Sofie Neumann, Victoria Nießner, Daniela Schomberg Nieto, Julia Melinda Nill, Miriam Obuz, Chiara Catharina Ölmüller, Eleonora Pepe, Anna Pfeiffer, Aneta Joanna Polaczek, Samantha Pradella, Lara Selina Reuter, Kimberly Cassandra Richter, Sofia Riesner, Anna Rosenbaum, Carina Bianca Rouse, Sara Saba, Mai Tamer Saleh Said Saleh,

Fenja Schaper, Andrea Jennifer Schmidt, Laura Schmidt, Ann-Kristin Schneider, Marieke Schorling, Mareen Schröder, Miriam Heike Schroers, Marco Schu, Caroline Sophie Schuler, Stefanie Schuster, Daria Shevtsova, Benita Saskia Stadtmüller, Philipp Wolfgang Staufer, Adina Stefan, Viktoria Stock, Svenja Stolpe, Pia Stütz, Dawid Kamil Suferowicz, Lena Josephine Sümenicht, Sibel Tasdemir, Ioanis Tchivoulou, Paulain-Norbert Tekunju Songwah, Mehriban Teyyar, Michael Johann Tiefau, Katerina Tsitsas, Sophie Unverzagt, Melina Pia Uusi-Illikainen, Lara Leonie von Tiedemann, Angelika Wallenstein, Jasmin Walter, Inna Warkus, Darleen Wehner, Simone Anita Weisenberger, Vanessa Wittemann, Jessica Zientek, Patricia Zündorf.

We want to express our heartfelt gratitude to all participants, and especially to our colleagues Silvia Hansen-Schirra, Katja Abels, Sarah Signer in Mainz/Germersheim and Ezekiel Anumba, Silvana Deilen and Rebecca Schulz in Hildesheim. Without their professional and untiring work, the translation of this book would not have been achieved.

Christiane Maaß and Isabel Rink Hildesheim, summer 2023

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Christiane Maaß and Isabel Rink

Introductory remarks

1 Aims of the Handbook "Accessible Communication"

Communicative accessibility is booming: The range of texts in Easy Language and Plain Language, information in sign languages – which can be accessed via QR codes or remote interpreting – speech-to-text interpreting, community interpreting or the range of films and shows with subtitles and/or audio-descriptions is greater than ever. In recent years, accessible communication has consequently moved into the societal focus. It is becoming apparent that the demand for professional communication offers that take the diversity and plurality of our increasingly differentiated information society into account will continue to grow.

Aspects of the perceptibility and comprehensibility of communication have been the subject of research for decades. Currently, however, it can be observed that the scientific investigation of accessible communication is establishing itself as a separate area of research. This is reflected by the increased number of publications in this area as well as in the current networking efforts of formerly separate disciplinary approaches.

An important impetus for this development was the adoption of the UN Convention on the Rights of Persons with Disabilities (UNCRPD) and its ratification in numerous nations around the world. The UN Convention on the Rights of Persons with Disabilities also had profound effects on German legislation: The German Act on Equal Opportunities for Persons with Disabilities (Behindertengleichstellungsgesetz, BGG) was consequently amended (BGG, June 2016), and more amendments are planned. In addition, with the German Federal Participation Act (Bundesteilhabegesetz, December 2016) a model for the integration of the topic in a variety of fields was created. On this basis,

an expanding market for accessible communication offers is currently being established. This market is partly unregulated and intuitive, available expertise is not being harnessed in all areas. The communication offers consequently exhibit a heterogenous quality. This is one of the reasons why, with regard to tendering authorities, some of which are already legally obliged to offer accessible communication, there are many uncertainties.

And this is precisely where the editors have situated this handbook. On the one hand, the aim of the handbook is to collect research on accessible communication from a variety of disciplines and make the current status as well as existing desiderata more visible. It therefore contributes to interdisciplinary networking in the previously outlined sense and to a consolidation of accessible communication as an autonomous research discipline. On the other hand, this handbook serves as the basis for professional action in the market by making application-oriented as well as theoretical knowledge more accessible. This volume therefore also includes contributions by practitioners who reflect on their professional behaviour and also by users of accessible communication products who explain how they deal with communication and highlight needs and dysfunctions. Between theory and practice lies the area of academic training for future market actors. The first study and training programmes, of which this handbook provides an overview, are currently further establishing themselves.

2 Accessible communication: Defining the concept

The German Act on Equal Opportunities for Persons with Disabilities defines the term "accessible" as follows:

> Accessible are structural and other facilities, means of transportation, basic technical commodities, information processing systems, acoustic and visual sources of information and communication facilities as well as other created areas of life, if they can be found, accessed and used by people with disabilities in the general customary manner and without the assistance of others. The use of aids that are necessary due

> to disabilities is permitted here. (German Act on Equal Opportunities for Persons with Disabilities (BGG) 2016 § 4)

Participation and independent use are central aspects in this respect. The concept is being elucidated in the use of adjectives such as "findable", "accessible" and "usable". It opens up the possibility that "aids […] necessary due to disability" can be used, therefore the concept is positioned in the area of tension between universal design and assistive technologies. According to the UNCRPD, universal design shall be preferred in principle, i.e. the world is to become more inclusive and accessible as a whole and give people with different preconditions respective equal access. However, this is not always possible. Occasionally, assistive technologies have to compensate for disabilities in order to make accessibility possible, which is why several contributions in this handbook deal with this topic.

The aspect of accessibility "without particular difficulty" remains rather vague in the German Act on Equal Opportunities for Persons with Disabilities (BGG); it can potentially refer to a variety of dimensions of physical or mental exertion, but also to financial effort or a general ability of gaining access. This vagueness complicates the issuing of claims and demands. Therefore, actually being able to access appropriate accessible communication offers is often not easy in practice for people with disabilities.

At first glance, the statements of the UN Convention on the Rights of Persons with Disabilities are specific by comparison:

> Communication includes languages, display of text, Braille, tactile communication, large print, accessible multimedia as well as written, audio, plain-language, human-reader and augmentative and alternative modes, means and formats of communication, including accessible information and communication technology. (UN Convention on the Rights of Persons with Disabilities 2008, article 2: Definitions)

The UN Convention on the Rights of Persons with Disabilities does not, however, correlate with the actual legal situation of people with disabilities living in Germany. Instead, the convention is more of a moral framework in

the sense of a social goal and cannot be directly transformed into concrete legal claims. Additionally, the quoted list is very heterogeneous and repetitive and does not list terminology on the same level:

- Braille is a tactile form of communication.
- Large print is part of the display of text.
- Accessible multimedia includes auditory forms and is based on information and communication technology.
- "Human-reader format" is also identical to "auditory".
- "Language" in turn is a generic term for a whole series of the subsequent elements.

The statements in the UNCRPD therefore show terminological vagueness and are, at best, a starting point for research and practice.

Consequently, further clarification of the subject is necessary. Subsuming the contributions of this handbook, accessible communication can be defined as follows:

> Accessible communication encompasses all measures of reducing communication barriers in various situational fields of action. Communication barriers can exist with regard to the sensory organs and/or the cognitive prerequisites of the communication participants as well as with regard to the language, expert language, expert knowledge, cultural and media requirements that texts impose upon recipients. Communication barriers arise where texts are not adequately adapted to the target situation and the target audience.

In the broadest sense, every form of interaction can be obstructed by barriers, e.g. even between experts and laypersons without a communication impairment. Other research approaches define accessible communication in a narrower sense and restrict it to recipients who due to disability, diverging educational opportunities or interfering life events such as fleeing or migration require an adapted text practice to independently participate in society.

In this sense, some contributions to this handbook are dedicated to the specific requirements different groups of users have in terms of the perceptibility and comprehensibility of communication offers. Other contributions examine professional areas of communication in particular as well as in how far they constitute barriers for users, for example in medical and legal communication or in technical communication. All things considered, the handbook provides a view of the diverse forms, areas and text types of accessible communication. This area is essentially open-ended and will continue to develop in the future.

The handbook has set itself the goal of depicting as broad a spectrum as possible of the representative development of such forms, areas and types of text as they are currently realised in textual practice and as they are partly already reflected in research.

"Accessibility" in its literal sense is a utopia. Actual accessibility for all users will often not be possible as the requirements of the different groups of users contradict each other. Moreover, the resources for creating the texts are often limited. Additionally, the expertise of the people acting in this area has in many cases not been ideally developed, even though professionalisation processes are taking shape at the moment. In general, "accessible communication" also refers to the creation of communication offers that are partly accessible (German: "barrierarm") or, in relation to the source text, have fewer barriers (German: "barriereärmer") or that are optimised in terms of perception and/or comprehensibility. Since "accessible/accessibility" is also the term used in the legal context, it is used synonymously with the term "partly accessible" in this handbook even though there is no synonymy in the strictly semantic sense.

This handbook makes accessible communication tangible in its prerequisites and various facets. The results of the different areas in their approaches and overlaps are presented so that the field as a whole can be developed. Based on this, new insights can be gained in order to create accessibility to an even greater extent in the future.

3 Profile of the handbook

Accessible communication is not only the subject of scientific examination but also a widely differentiated field of practice, the actors of which are producers and users of accessible texts. However, not all forms of practical solutions for problems and actual text offers, but also needs and ways of reception of those offers, have been scientifically reflected upon yet.

Often the articulation of needs and work on practical solutions are the first steps followed by years of theorising. The concept of Easy Language, for example, emerged from the context of empowerment as did the first sets of regulations that formed the basis for the first text practice. Approximately five years later, scientific examination of the subject began. Now, Easy Language is a broadly researched subject in science. Along with merely theoretical examinations, there is also application-oriented research that reacts to practice and contributes to a professionalisation of those working in the market. At present, research is entering into an empirical phase in which subject studies are carried out to determine prerequisites for the understanding and processing of texts. The same applies to many other forms and aspects of accessible communication (e.g. audio description, subtitling for people with hearing impairments, sign language interpreting etc.).

The inclusion of the users' perspective in theory and practice is essential for the subject of accessible communication because taking the addressees into consideration is, in any and all constellations, a prerequisite for successful communication. If there is a barrier hindering access to the text for a user, it cannot be received. In order for an offer to be truly accessible it has to be adapted to the concrete needs of the addressees. These needs can be empirically determined. Due to the time delay and selectivity of the research, there are presently no reliable studies for all the subject areas.

The needs can also be determined discursively: people with communication difficulties can be asked about their needs, forms of use and existing desiderata. Such a discourse remains necessarily fragmented and cannot claim to be representative. However, giving those from the field of practice an audible voice often opens up unexpected perspectives and allows insights which would otherwise not have been attainable in any other form. The same applies to producers of

accessible communication: Due to their expertise, they cannot only report on current practice but they can also often give information about concrete needs of the addressees and about mediation between clients and consumers.

Therefore, the editors have decided to support the scientific part of the handbook with a section called "Voices from the field of practice". In this section, producers and consumers report on their experiences and wishes regarding accessible communication. Some take on two roles by being both recipients and producers of such texts.

4 Retrievable > perceptible > comprehensible > linkable > action-oriented

The UN Convention on the Rights of Persons with Disabilities and also the implementation in the national legislation (German Act on Equal Opportunities for Persons with Disabilities (BGG) and further) aim to make independent participation possible for all people. Participation is an active concept directed at interaction in the context of society. Separation is intended to be overcome and a community of people with and without disabilities should ideally be created. Accessible texts are necessary to make this possible because only through accessible texts can people with disabilities have independent access to information of all kinds, which is required by law. This is a prerequisite for participation in an information society. Access to information is also a prerequisite for participation for people with communication difficulties that are not grounded in disabilities.

Depending on the perspective, the process of making texts accessible is divided into the following five aspects:

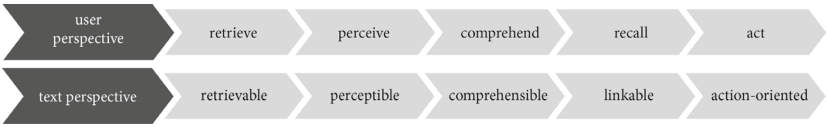

Figure 1: Accessibility of texts

Users have to be able to find texts. They have to be able to perceive them, because this is the prerequisite for further processing the information. However, the perception process may only require a certain number of resources resulting in sufficient processing capacity for the subsequent steps. The perceived information has to be comprehended and semantically as well as syntactically integrated. This step also has to leave sufficient resources available in order to link it with existing knowledge and store newly added information. Only if all these steps do not overstrain the users' capacity for comprehension, is action in any way possible in the next step, which can already be considered participation.

These are the resulting requirements for the texts: They have to be retrievable to make the next steps possible. If they are not perceptible by the users they can consequently not be comprehended. If they are not comprehensible they cannot be recalled. If sources of knowledge are not presented in a way that makes them linkable with existing knowledge, there is no basis for action. Ideally, a target situation is already embedded in the texts themselves thus initiating an orientation towards action.

The contributions to this handbook are situated along these aspects – either from the users' or the texts' perspectives.

5 Acknowledgements

A project like this cannot be successfully completed without the active support of a multitude of people. The handbook was developed in the summer of 2017 when we became painfully aware of the lack of such a work. We wanted to compile fundamental literature for the new Master's programme "Barrierefreie Kommunikation" (accessible communication). We then wrote to colleagues from German-speaking countries who are conducting relevant research or are successfully active in the field of practice and asked them for contributions, but also explained to them the particularly tight timeframe – the handbook was intended to be published before the beginning of the Master's programme in October 2018. We were pleasantly surprised to receive so many high-calibre confirmations for a project at such short notice. We were even more surprised to find that the promises of making a contribution were kept almost without

exception so the project could actually be concluded within the ambitious deadline.

We would like to take this opportunity to thank all contributors for their discipline in adhering to deadlines and especially for their extremely inspiring, informative and comprehensive contributions which will carry forward the field of accessible communication as a whole.

The section "Voices from the field of practice" was mainly overseen by Loraine Keller and Sergio Andres Hernández Garrido. Additionally, Loraine Keller was responsible for proof-reading the whole handbook and performed the task with the greatest care. Many thanks to both of them.

Christiane Maaß and Isabel Rink Hildesheim, summer 2018

Perceptibility and comprehensibility requirements

Isabel Rink

Communication barriers

1 Introduction

One of the maxims of inclusive societies is that they be as accessible as possible (Bieling et al. 2012). Access should not only be a given at the physical level, but should also apply to its perceptual and cognitive design. In the last few years, various forms of access, which include communication, have been further examined and developed as people can only participate in a society in which they have access to all forms of communication. Communication barriers often complicate or deny access to information for many recipients. Therefore, the following article will focus on how to lower different types of communication barriers.

2 Types of communication barriers

Texts as a form of communication can contain different forms of barriers "that inhibit participation in communication" (Schubert 2016: 15; English translation of the German original). Depending on their form, these barriers can make it difficult for a recipient with or without an impairment (see chapter 3) to access and fully understand the subject of a text. In some cases, they might not or only insufficiently understand the text as the barriers negatively correlate with its perceptibility and comprehensibility. According to Schubert (2016) and Rink (2020), communication barriers include the *sensory barrier*, the *expert knowledge barrier*, the *expert language barrier*, the *cultural barrier*, the *cognitive barrier*, the *language barrier* and the *media barrier*. These barriers will be the topic of the following discussion.

a) The sensory barrier

If a sensory channel is substantially impaired, successful reception via this sensory channel will not be possible (Schubert 2016: 18). What is meant here is the modality or manner of information reception via the different sensory organs as channels of perception. Texts as a form of communication can be processed auditorily, visually and haptically. A mixture of the three is also possible (see section g). When a text requires perception via these channels, but eyes, ears or hands are not available as channels of perception for information reception, we can speak of a sensory barrier.

b) The expert knowledge barrier

An expert knowledge barrier arises when the topic is of a specialist nature that is also reflected in the language (see sections c and f). If a text has an expert knowledge barrier, the reader will not understand the subject of the text as he or she lacks expert knowledge as a precondition to access the content of the information: "[…] the affected people do not understand the content of the information, because they lack expert knowledge, in this case knowledge of the topic of the text" (Schubert 2016: 18; English translation of the German original). According to Kalverkämper (1998a: 12; English translation of the German original) "the 'comprehensibility' of a text is strongly connected to its quality, namely the specialist knowledge. Comprehensibility therefore is a *communicative quality* of a text" that primarily enables communication between experts. It is for this reason that it creates communication barriers for laypeople (see Kalverkämper 1998b, chapter 3.2.3) [emphasis in the original].

c) The expert language barrier

Similar to the expert knowledge barrier, the expert language barrier and comprehensibility also correlate negatively. If specific terminology is used in a text, the reader usually understands the language, but not the special terminology that carries the content of the information. Schubert (2016: 19; English translation of the German original) notes that both communication barriers can "occur at the same time, but are not necessarily connected to each other".

The expert knowledge barrier and the expert language barrier occur in specialised communication. Specialised texts currently represent the biggest

obstacle in accessible communication. Therefore, they will be systematically included in this article. If a text is not a specialised text, it will exhibit neither an expert knowledge nor an expert language barrier. As a result, its accessibility index (see further down) will be lower. Therefore, the respective linguistic, media and conceptual strategies do not need to be applied to these types of texts.

d) The cultural barrier

According to Vermeer (1990: 36), culture can generally be described as the sum of all conventions in a society. When a cultural barrier occurs, the reader's cultural knowledge required to understand the text is not sufficient. This knowledge includes knowledge of discourse and text types as well as their linguistic, medial and conceptual design (Schubert 2016: 18).

e) The cognitive barrier

According to Schubert (2016: 18 f.), a cognitive barrier occurs when "the linguistic or content-related complexity of a message" exceeds the processing capacity of the recipients (2016: 18 f.; English translation of the German original). In this case, recipients fail to understand because information is "communicated indirectly, is negated, linked to each other" (ibid.). The argumentative structure therefore has a negative effect on the processing capacity of the recipients (for further information see also *cognitive load theory*, Sweller et al. 1998).

f) The language barrier

The language barrier concerns the level of the linguistic code as a medium that carries information. According to Weidenmann (2002: 45 f.) and Fröhlich (2015: 98), the term "code" can be characterised as a system that consists of heterogenous (graphic) characters, pictures or symbols. A language barrier occurs in particular when German is not the recipient's first language (see sections d and g).

g) The media barrier

The media barrier can take different forms in terms of code, mode and medium (see Rink 2020). If the level of the code is affected, linguistic information coded

in a certain way cannot be decoded when it is i.e. coded via different characters or symbol systems (see section f). Concerning the level of the mode, a barrier occurs when the sensory organ as a sensory channel necessary for information reception is not functional (see section a). Texts can be processed auditorily, visually or haptically, whereby a mixture of these modes, i.e. audiovisual or audio-haptic, is also possible. If the level of mode is affected, information reception will already fail at the moment of perception. In addition to code and mode, the medium itself can also become a barrier because, according to Weidenmann (2002: 46) it represents a carrier of information in the technical sense. Hence, it refers to the carrier medium as a transmitter of information and its accessibility. This form of the barrier is of special relevance with regard to the heterogeneous group of recipients. Their special needs and ways of using language determine their preferred access via certain media (see Rink 2020).

Texts can shape the described barriers to different extents depending on linguistic, medial and conceptual text design. The respective specific qualification profile of the recipients is a decisive factor for the extent to which the barrier has a negative impact on perceptibility and comprehensibility.

3 People with different forms of communication difficulties

According to Christmann (2006: 612 f.), *text comprehension* is conceptualised as the result of an interaction of parameters concerning text and user perspective:

> The process of understanding a text is modelled as an interaction between two parallel processing directions. On the one hand, there is the rising, bottom-up processing, which is steered by the text and influenced by text features. On the other hand, there is the descending, top-down processing, which works with concepts and expectations that are characterised by features of the recipient's cognitive structure.

While communication barriers with a negative effect on the perceptibility and comprehensibility of a text were at the centre of the previous chapter, this

chapter will now focus on the recipient. The recipient's "previous knowledge, goals, expectations and fields of interests" are very much involved in the process of understanding a text (ibid.; English translation of the German original).

3.1 People with perception impairments

A text's comprehensibility is subordinate to its perceivability: Only if the reader can perceive a text without needing too many resources, can he or she semantically integrate and process the content of a text. The first group with communication impairments to consider when discussing this topic are people with sensory disabilities (visual impairment, hearing impairment). People with visual impairments are in the focus of the articles by Kahlisch/Dobroschke, Schütt, Benecke, Mälzer/Wünsche and Capovilla in this volume. Therefore, this article will only offer a short introduction:

a) People with visual impairments

In the heterogenous field of visual impairments, German law differentiates between "visually impaired", "profoundly visually impaired" and "blind" (see Degenhardt 2007: 41 and DBSV 2018: numbers & facts):

- A person is considered *visually impaired* if he or she does not have a remaining vision of more than 30 % in the better eye, even with a visual aid.
- A person is considered *profoundly visually impaired* if he or she does not have a remaining vision of more than 5 % in the better eye, even with a visual aid.
- A person is considered *blind* if he or she does not have a remaining vision of more than 2 % in the better eye, even with a visual aid or if he/she has a limited field of vision despite better visual acuity (ibid.).

It is possible to test the extent to which different forms of impairments complicate seeing with the help of the *sight loss simulator of the ABSV* (ABSV 2017: Sight loss simulator).

Depending on cause, extent and age, people with visual impairments or sight loss need different forms of support that are also covered by the law

(see e.g. the German Social Code [Sozialgesetzbuch, SGB], especially SGB IX and XII, the Act on Equal Opportunities for People with Disabilities [Behindertengleichstellungsgesetz], especially § 3, 4, 10 and 12 or the Income Tax Act [Einkommenssteuergesetz], see the article by Lang in this volume). These people, given that one of their sensory organs is limited in its function as a sensory channel for information reception, have different communication and text requirements.

The second form of sensory disabilities are hearing impairments. People with hearing impairments are addressed in this volume in the articles by Hennies, Witzel, Mälzer/Wünsche, Benner/Herrmann, Kurch as well as Maaß, LM. In their articles, they observe that there are profound differences between people with prelingual and people with postlingual hearing impairments. In this article, the main focus is on the group of people with prelingual hearing impairments.

b) People with prelingual hearing impairments

In medicine, *deafness* is classified by the degree of hearing loss. Someone can be considered deaf if "he or she has a degree of hearing loss of more than 60 dB in the frequency between 125 and 250 Hz, and more than 100 dB in all other ranges" (DGLB n.d.: deafness; English translation of the German original). In contrast, *people with prelingual hearing impairments* usually do not define themselves by their lack of hearing ability. Deaf people instead identify as a member of a different diaculture: the deaf community.

In Germany, approximately 80,000 people are prelingually deaf. Most use German Sign Language (Deutsche Gebärdensprache, DGS) for communication. Even though DGS has been officially recognised as a language since 2002, deaf people still live as a linguistic minority in the middle of a society that mainly uses spoken and written language as the dominant method of transporting information (see Rink 2020). Therefore, this group of people has to have knowledge of German Written Language to be able to participate equally without the help of a third person. Nonetheless, deaf people have to learn the German language, which differs in many aspects from DGS, as a second language. This is anything but trivial considering the impairment of the auditory channel (see Prillwitz/Wudtke 1988, Bouvet 1990, Wudtke 1993a and b,

Krammer 2001, Brotzmann 2004, Hennies 2009 and Hennies in this volume). The studies in Wudkte (1993a and b), Krammer (2001) and Hennies (2009 and in this volume) suggest that the reading and writing skills of many deaf people are very limited due to various reasons. This form of impairment thus results in a need for a specific type of communication (see chapter 4).

c) People with hearing and visual impairments

Hearing and visual impairments can occur as single forms of sensory disabilities, but they can also occur together. This happens more frequently with advancing age. Only a relatively small group of people in Germany is simultaneously affected by innate forms of severe visual and hearing impairments. The German Association for the Deafblind estimates that around 4,000 to 9,000 people have very special needs concerning their requirements for accessible texts (see Nonn/Päßler-van Rey 2011: 53 f.).

It was not until December 2016 that deafblindness finally received its own code (TBI) in the German Disability Card, which makes it possible for affected persons to access appropriate services. People with deafblindness communicate via the tactile-kinaesthetic channel. Lorm, receptively finger spelling, is the scanning of the finger alphabet on the hand or a specific area of the hand as a tactile form of communication, which is used for the exchange of information (see BAT 2008: Tactile finger alphabet, German Deafblind Network, n.d.: Lorm). All in all, there is a major demand for research, which mostly relates to the communicative requirements of deafblind people. The most recent efforts focused on the development of a Lorm Glove (Bieling et al. 2012) that is supposed to simplify communicative participation for the respective group of people.

3.2 People with comprehension impairments

Even though accessible communication is oriented mostly towards the needs of recipients with special requirements, other recipients also profit from texts that have been edited in order to be more easily accessible.

In their level-one study on the *literacy of adults at lower competence levels*, Grotlüschen and Riekmann (2011, 2012) were able to prove that approximately 40% of the German adult population fit for work (people between the age of 18

and 64 with sufficient language skills) have deficits in their reading and writing skills (Grotlüschen/Riekmann 2011: 2 ff.; 2012: 19 ff.). This corresponds to about 21,000,000 people. Grotlüschen/Riekmann (2012: 19 ff.) classify people who fall below literacy level 4 or the text level as functional illiterates in the narrow sense, as the following table (1) shows:

Literacy	Alpha level	Share of adult population	Amount (extrapolated)
Functional illiteracy	α 1	0.6%	0.3 Mio.
	α 2	3.9%	2.0 Mio.
	α 3	10.0%	5.2 Mio.
Sub total		14.5%	7.5 Mio.
Poor writing	α 4	25.9%	13.3 Mio.
	> α 4	59.7%	30.8 Mio.
Total		100.0%	51.6 Mio.

Table 1: Functional illiteracy and poor writing. Source: leo. – Level one study, n=8,435 German-speaking people aged 18–64. Deviation of total from 100% due to rounding effects.

In Germany, approximately 300,000 people are below the word level in terms of their reading and writing skills. Therefore, they can be assigned to literacy level 1 (α1). Approximately 2,000,000 people reach the word level but not the sentence level: People at literacy level 2 are able to read and write a few words, but they fail at syntactic integration (Grotlüschen/Riekmann 2012: 20). At a literacy level of 3, the people concerned (approximately 5.2 million) can handle short sentences, but cannot master the text level (ibid.). A further 13.3 million people with a literacy level of 4 are added to those 7,500,000 people. They have mastered the word, sentence and text levels, but their written language contains mistakes even when using common vocabulary (ibid.) Grotlüschen/Riekmann (2011: 2; English translation of the German original) add that "the spelling as taught until the end of elementary school is not mastered sufficiently. Typically people who fall below that mark avoid reading and writing in most cases."

The participants' linguistic competences were therefore strong enough to take part in the study as well as in the competence tests (Grotlüschen/

Riekmann 2011: 8). Bredel/Maaß (2016) note that this is why people with serious linguistic and cognitive impairments, who are at the focus of accessible communication and of this volume, could not participate in the study due to systematic considerations. The results therefore only partly consider those people, whose demands for accessible, i.e. easily perceivable as well as easily understandable texts are the result of the nature of their impairment and whose literacy skills are thus limited in a special way.

The field of people with different forms of communication difficulties is extremely diverse. In order to narrow this field down, the following discussion focuses on the *primary recipients of texts in Easy Language* according to Bredel/Maaß (2016).

> **Primary recipients** need all or most text types in Easy Language. They do not have access (or very limited access) to general texts or expert knowledge texts. Providing information in Easy Language enables these people to participate independently and directly in communication processes in all areas of public life (Bredel/Maaß 2016: 139) [emphasis in the original].

Therefore, this article focuses on people who need texts in Easy Language as a form of accessible communication because their literacy skills are too low to participate at all. According to Bredel/Maaß (2016, chapter 5), this group of people includes people with cognitive disabilities, people with learning difficulties, people with dementia-type illnesses, people with prelingual hearing impairments, people with aphasia and people with German as a second language. Furthermore, the previously mentioned group of functional illiterates also profit from texts in Easy Language as well as from accessible communication in general. Still, Bredel/Maaß (2016) emphasize that the term *illiterate* is an umbrella term. "Depending on the severity level of their impairment, people with learning difficulties, people with dementia-type illnesses, people with aphasia or people with prelingual hearing impairments also belong to the group of functional illiterates" (Bredel/Maaß 2016: 166; English translation of the German original).

This target group with its specific requirements will be introduced in the following.

d) People with a cognitive disability

The name of this group is currently at the centre of a heated debate in Germany, because the term "geistige Behinderung" (which can be translated as 'intellectual disability', which is closest to the variant that the respective group wants to avoid, 'cognitive disability' or 'learning disability') is considered discriminatory by the group itself (for more information see Schuppener/Bock in this volume). While the group members consider themselves "people with learning disabilities" in order to prevent stigmatisation (Netzwerk Leichte Sprache, n.d.: Das Prüfen), that term is traditionally used in research literature to describe another group of people (see section e: people with learning difficulties).

Considering the legal situation, the mixture of both concepts in the social debate (people with cognitive disabilities vs. people with learning difficulties) is not unproblematic, because only people with long-term physical, emotional, cognitive or sensory disabilities have a legal right to 'accessibility' and 'comprehensibility' according to § 4, 10, 11, 12. These disabilities in their interaction with attitude and environmental barriers hinder these people from participating equally in society.

> A period is considered long-term if its duration is most likely to exceed six months (Federal Ministry of Justice and Protection, BMJV 2016: BGG).

By contrast, *people with learning difficulties* have a legal right to accessible communication offers only if the duration of their difficulties can be proven (see BGG); i.e. judicial claims are connected to the use of the terms, which are defined by law.

According to Fornefeld (2002: 44), this group consists of

> people who have serious impairments at the level of their intellectual abilities (in the analysis and synthesis of perception, experience, inspection and recognition) as a result of brain damage. Respectively, these impairments have an impact on their learning and how they live their lives.

The form of impairment can determine specific requirement profiles concerning communication offers. Greatly reduced literacy skills can be one result of the mentioned impairment. A majority of this group consists of non-readers and/or needs communication offers that have been enhanced in terms of comprehensibility in order for them to be able to participate equally (see Bredel/Maaß 2016, Chap. 5.2.4; Ratz 2013). Schuppener/Bock (in this volume) highlight that this does not occur among all people with cognitive disabilities because of the heterogeneity of the group. Still, most are people with cognitive disabilities who have a legal right to content in Easy and Plain Language (BMJV 2016: BGG § 11).

e) People with learning difficulties

The term *learning difficulty* covers different forms of learning problems, which, according to Heimlich (2016: 33; English translation of the German original), can be differentiated by "extent, severity, duration, content, extent of influence and causes". According to these forms, learning difficulties can be subdivided into "general" and "severe learning difficulties" (see Heimlich 33: 31 ff.):

> People with severe learning difficulties differ from people with general learning difficulties because they need support, encouragement and mentoring in order to overcome their learning difficulty (Heimlich 2016: 13 f.).

The identified extent of support measures marks the difference between these two forms of learning difficulties.

According to Heimlich (2016: 38), there are special characteristics of learning difficulties in elementary school, namely: "*problems with learning to read, to write and to calculate*" [emphasis in the original]. These will consequently increase over time if no counteractions are taken. Reading is required for information reception and the development of knowledge. Therefore, Bredel/Maaß (2016: 151) conclude that:

> Texts in Easy Language help students and adults with learning difficulties to participate in the information society, because they provide information in an accessible and easily perceivable form […].

f) People with dementia-type illnesses

According to Kurz (2013: 5; English translation of the German original), approximately "80% of all dementia-type illnesses […] are caused by diseases of the brain", which are connected to the death of cells and advanced by the human aging process:

> Dementia-type illnesses usually occur in elderly people because they are connected to degenerative illnesses, the impact of which only becomes apparent with increasing age (Schindelmeiser 2016: 133; English translation of the German original).

Therefore, dementia-type illnesses are degenerative, neurological illnesses that start approximately at the age of sixty (Schindelmeiser 2016: 133; Kurz 2013: 7). The symptoms vary depending on the extent of the dementia-type illness. Symptoms may include increasing memory disorders, cognitive impairments as well as impairments of language and speaking abilities. Furthermore, orientation difficulties and a loss of motor skills can occur (see Kurz 2013: 10 ff.; Schindelmeiser 2016: 136). Acquired skills and competences decrease successively. This creates special demands, which also pertain to communication. Affected people struggle in particular to form concepts, which leads to major communication difficulties (see Gröning 2012: 41 ff.). Texts in Easy Language make the conceptual structure of content more transparent. They do not have many prerequisites, which could also help people with dementia-related degradation access texts because they are more comprehensible than source texts, which are not enhanced in terms of comprehensibility (Bredel/Maaß 2016: 155).

g) People with aphasia

Aphasia is an acquired language and communication impairment caused by an illness of the central nervous system:

> The so-called language centre is impaired, in which the language functions of the brain are located. More than 90% of people have their language centre in the left hemisphere of the brain. Impairments caused by aphasia can occur in every language modality. Aphasia affects speaking, understanding, reading and writing (Huber et al. 2006: 7, 2013: 24; English translation of the German original).

In most cases, a stroke is responsible for aphasia, but high blood pressure, diabetes, bleeding or undersupply caused by vascular malformations as well as brain damage (e.g. after an accident) can cause aphasia (ibid.). While communication impairments disappear within the first weeks of the course of a disease in one third of the patients, they solidify in the other two thirds. These impairments develop into long-lasting communication impairments that can affect the word, sentence and textual level. The following example, taken from Huber et al. (2006: 40), shows an extract of a conversation with a patient suffering from global aphasia:

S: How did the illness start?
P: mh … de … de dodo … and eh … do dodo … eh
S: Was that a long time ago?
P: noo… mh … dodo … dodo … (shows 4 fingers)
S: 4 weeks?
P: yes … dodo … and dudu
S: And did it occur all of a sudden?
P: mh … mh
S: How did it occur?
P: yes… dada (points to paralysed right side)
S: So, you woke up in the morning and weren't able to walk anymore?
P: noo dududu … and eh … dudodo and dodo

Depending on the cause, aphasia can have different manifestations, whereby the "characteristic single symptoms return in combination with other symptoms" (Huber et al. 2006: 39; English translation of the German original). The four standard types are: global aphasia, Wernicke aphasia, Broca aphasia and

amnestic aphasia (ibid.: 39). Approximately 50,000 people in Germany develop aphasia due to a stroke every year. Further causes of aphasia can be added to that number, which means that the number of people affected by aphasia is higher than 100,000 people every year (ibid.: 7).

Bredel/Maaß (2016: 166; English translation of the German original) assume that especially

> people with motor aphasia who have a damaged Broca's area benefit from the simple syntax [of texts in Easy Language] whereas people with sensory aphasia who suffer from a damaged Wernicke's area could benefit from texts with a reduced basic vocabulary as well as with extensive explanations of word meanings.

A respective empirical study, however, is still outstanding.

h) People with German as a second language

Foreign language acquisition usually takes place in an institution, mostly in schools with relatively homogeneous groups of students (see Lütke 2011: 26), whereas the term *second language acquisition* also covers processes of language learning that happen in an uncontrolled manner, meaning outside of institutions (Rösch 2011: 13).

According to Lütke (2011: 26), language acquisition mostly or exclusively occurs without lessons and with learners often having different second language conditions. Therefore, the focus is on people who live in Germany and manage their daily lives without having acquired written and spoken German as the official language in a didactic learning environment (ibid.). In the strictest sense, this very inhomogeneous group has a language barrier (see chapter 2, sections f and g), namely on the level of the linguistic code. Especially at the beginning of their stay, texts with enhanced comprehensibility can help to compensate for deficits in language, discourse and global knowledge. At the same time, they incentivise people to expand their writing skills, which is the precondition to processing standard and specialised texts (see Bredel/Maaß 2016, chap. 5.2.9 and Rink 2020). This group of people does not have a legal claim to accessible texts, while at the same time the majority of these people often, especially

shortly after their arrival in Germany, has to deal with different applications and forms that contain various communication barriers (see chapter 2) and therefore cause the readers difficulties as they have only had very few opportunities for language acquisition (see Bredel/Maaß 2016: 171 f., Rink 2020).

The number of immigrants in Germany has risen significantly since 2014, but the immigrants' abilities in their native language (not all are alphabetised) in terms of spoken and written language, as well as their second language abilities, can differ greatly (BPB 2016: data report 2016, p. 8). The result is a group of recipients that is confronted with different communication barriers (Rink 2020).

i) People with multiple disabilities

In the previous sections, excluding c, the different forms of impairments were conceptualised in a heuristic way, i.e. as prototypes of single disabilities or rather as forms of communication impairment. Not every form of communication constraint automatically implies an impairment, but when one of the above-mentioned barrier types appears, communication and access to a text can be affected to different extents. This article focuses on precisely that issue.

The described single phenomena can occur separately, but also in combination, as well as in mixed forms, e.g.:

- Deafblindness (c)
- Dementia-type illness and hearing impairment
- German as a second language and cognitive disability
- German as a second language and learning difficulties.

These are only some examples of possible combinations of communication impairments. Their levels of severity can differ individually.

According to Schnoor (2007), the disability patterns, which are classed as seriously disabled, severely disabled and multiple disabilities, occur as a consequence of different impairments. Furthermore, they vary significantly in terms of type and manifestation.

Due to this heterogeneity, *multiple disabilities* cannot be classified as disabilities with consistent disability patterns (ibid.). Therefore, deafblindness has

been considered in a special way with regard to the needs of the people affected in the new Federal Participation Act (Teilhabegesetz).

Forms of multiple disabilities that "in their sum […], lead to severe limitations for the human in all aspects of life" (ibid.; English translation of the German original) are as diverse as the causes. The people affected are not only limited in their perception and communication, but also in their "experience and expression" in general (ibid.). Schnoor (2007) as well as Folta-Schoofs, Musenberg and Schuppener/Bock (in this volume) found that these multiple forms of impairments create special demands in terms of participation.

4 Communication barriers and forms of impairments

The types of barriers following Schubert (2016) and Rink (2020) were presented in chapter 2. Barriers have potentially negative impacts on communication, all the more if the text simultaneously constitutes multiple barriers for the readers. Depending on their forms, the barriers can make it more difficult or even impossible for recipients with and without impairments to access information, which frequently results in misunderstandings or incomprehension (see Schnotz 1994: 32 ff.). However, the different forms of barriers do not always necessarily inhibit communication in the sense of an absolute (comprehension) threshold. Instead, it can be considered a dynamic concept: the barriers may have "gradual downgrading" that, depending on their forms, restrict access to communication to a greater or lesser extent (Schubert 2016: 17; English translation of the German original). Furthermore, they are dependent on the recipient's determinants, which were presented for the various target groups in chapter 3.

Table (2) shows how communication barriers and different types of impairments negatively correlate. The top of the table presents the various types of impairment, including visual impairments, prelingual hearing impairment, cognitive disability, learning disability, dementia-type illnesses, aphasia as well as German as a second language and functional illiteracy. The left column shows the various types of barriers that can affect communication. These

include the sensory barrier in its *auditory*, *visual* and *haptic* forms, the expert language barrier and expert knowledge barrier, the cultural, the cognitive and the language barrier as well as the media barrier in the following forms *phonic*, *graphic*, *haptic* and *medium* (see Rink 2020).

Since this article focuses on barriers that emanate from texts themselves, the *modality* or the form of realisation of the content is the primary focus of the considerations. According to Burger (2005: 143; English translation of the German original), text "can be realised phonically, with sounds (i.e. acoustically at the same time), or graphically, with characters (i.e. visually at the same time)". In addition, audio-haptic and audio-visual forms of realisation are possible, namely when texts are simultaneously phonically and haptically or phonically and graphically accessible. The terms "phonic" and "graphic" will be used following Burger (2005) and Koch/Oesterreicher (1994): While "phonic" refers to the auditory level, i.e. hearing, "graphic" refers to the visual level and refers to seeing. In contrast, the haptic level refers to touching, which is usually done with the hands. Since Braille is a special system of characters that can be perceived haptically, it will be included here under the "haptic" form of realisation; Lorm also has a haptic form of realisation. In addition to the forms "phonic", "graphic" and "haptic", the medium itself, in the sense of access to a device, can also represent a barrier (see Rink 2020). Information is therefore not accessible if the media necessary for its reception are not available to an addressee group or are not commonly used by them. With regard to this form of expression, factors such as *age*, *social class*, *infrastructure* or *end devices* play a decisive role, as they influence the preferred access to content via certain media (see Rink 2020). The columns each trace a form of impairment, whereby it is assumed that in the case of multiple disabilities or multiple forms of impairments, measures must be taken with regard to all respective categories.

The following table (2) presents an overview of how forms of barriers and impairment covary:

Table 2: barrier index (BI)

		Forms of impairments							
Type of barrier		cognitive disability	learning difficulties	dementia-type illness	prelingual hearing impairment	aphasia	German as a second language	visual impair-ment	functional illiterates
sense	auditory	0	0	0	1	0	0	0	0
	visual	0	0	0	0	0	0	1	0
	haptic	0	0	0	0	0	0	0	0
field		1	1	1	1	1	1	1	1
expert language		1	1	1	1	1	1	1	1
culture		0	0	0	1	0	1	0	0
cognition		1	0	1	0	0	0	0	0
language		0.5	0	0.5	1	1	1	0	0
media	phonic	0	0	0	1	0.5	0	0	0
	graphic	1	1	0	1	0.5	0	1	1
	haptic	0	0	0	0	0	0	0	0
	medium	0	0	1	1	0	0	1	0
barrier index (BI)		**4.5**	**3**	**4.5**	**8**	**4**	**4**	**5**	**3**

The characteristics presented in the table are postulated on the basis of the available findings regarding the respective target groups and barrier types. Further empirical research is required for each individual target group in order to be able to introduce further specifications and, if necessary, make corrections.

4.1 Profile of addressee(s)

The profile of the addressee(s) represents the degree of the respective form of impairment in relation to the different barrier types. The focus is therefore on the specifics of each form of impairment, as shown in the columns of the table.

a) Visually impaired persons

In the case of visually impaired persons, one of the sensory organs is restricted as a perceptual channel for the reception of information (1). Content that is not presented in a media-appropriate way therefore cannot be received. While visually impaired people have no limitations with regard to a phonic realisation, content that is realised exclusively graphically quickly becomes a difficulty for them (1) or they have to process it further in order to access it in a different media realisation (e.g. with the help of a scanner). Moreover, the nature of the disability results in a preferred type of use in relation to the medium, which restricts information reception (1). A further difficulty can be identified in relation to the expert knowledge barrier (1) and the expert language barrier (1). Incidentally, these barriers pose challenges for all addressees with and without impairments if they, as laypersons, want to access information about complex and abstract issues or subjects, for example in the area of legal-administrative or medical communication (see Rink 2020, Schaeffer et al. 2016, Bredel/Maaß 2016, Bromme/Jucks/Rambow 2004, Eckhardt 2000 and Kalverkämper 1998a and b). There are no limitations with regard to the cultural (0), cognitive (0) or language barrier (0).

Thus, the barrier index for the group of *visually impaired persons* is at a value of 5 and is the second highest after the group of persons with a prelingual hearing impairment.

b) Persons with a prelingual hearing impairment

Persons with a prelingual hearing impairment have an auditory barrier (1), which means that phonically realised texts or content cannot be perceived (1). Chapter 3 showed that there is also a barrier with regard to graphically realised content (1), because society's inappropriate treatment of this form of disability often also results in a serious reading impairment among deaf people. Content with expert knowledge (1) and expert language (1) poses great challenges for the addressees, as the frames and scripts necessary for text interpretation on expert topics very often do not exist (see chapter 3, Bredel/Maaß 2016, chap. 5.2.6). The form of impairment determines the preferred access to information via certain media, which is why texts that are not available in a correspondingly media-prepared form (e.g. DGS interpretation, DGS video, language with enhanced comprehensibility) simply cannot be received (1). In addition to the sensory barrier (1), the expert knowledge barrier (1), the expert language barrier (1) and the media barrier in its various forms – *phonic*, *graphic*, *medium* (1+1+1) – the language barrier (1) and the cultural barrier (1) are also affected, because deaf people as members of the deaf community differ in language and culture from members of the majority society (see chapter 3). Only cognition is not limited in deaf persons (0), so that they are usually fully capable of conducting business (see Bredel/Maaß 2016: 159 and Maaß/Rink/Zehrer 2014: 59).

A look at the table shows that the BI of this group with 8 out of 10 possible points is the highest among the groups with a single impairment.

c) People with hearing and visual impairments

Persons with hearing and visual impairments have two restricted sensory organs as channels of perception for the reception of information, which is why the specificity of this group lies in their multiple disabilities; the characteristics of two columns apply: hearing impairment and visual impairment. The barrier index of this group of addressees is therefore particularly high with a value of 9. Depending on the degree of impairment, there is a visual and an auditory sensory barrier (2), an expert knowledge barrier (1), an expert language barrier (1), a cultural barrier (1) and a language barrier (1). With regard to the media barrier in its various forms, only the haptic realisation (0) is not affected, which is why communication must take place in particular via this

channel. The demands on the linguistic, media and conceptual strategies are particularly high due to the special requirement profile of this group.

d) People with a cognitive disability

For this group neither a sensory barrier (0) nor a cultural barrier (0) can be stated; instead, the barrier lies in the area of cognition (1). Persons with cognitive disabilities are generally able to orientate themselves communicatively in the areas of life that affect them by means of common language. Problems related to language arise primarily when information is realised in a linguistically or linguistically and content-related complex manner (0.5). These difficulties are all the more severe when it comes to the reception and processing of complex issues, because the nature of the impairment is often such that the expert knowledge (1) and expert language barrier (1) cannot be overcome independently (see chapter 3 and Rink 2020). With regard to the media barrier, only one of three forms of impairment poses problems, which concerns graphic realisation: Since a large proportion of persons with cognitive disabilities are non-readers, writing as a carrier of information in particular becomes an insurmountable difficulty for this part of the target group (1) (see chapter 3 and Rink 2020). The extent to which a barrier exists with regard to the category "medium" would have to be examined by means of usage studies. According to this calculation, the barrier index of persons with cognitive disabilities reaches a value of 4.5.

e) People with learning difficulties

People with learning difficulties very often have problems receiving and processing graphically realised content (1). The difficulties increase if the content is additionally characterised by expert knowledge (1) and expert language (1). Those affected often cannot access such content without the help of third parties (see chapter 3 and Rink 2020). Apart from these three barrier types, the group is not affected by other communication barriers, which is why the barrier index of this group is 3.

In comparison, it is noticeable that *persons with learning difficulties* and *persons with cognitive disabilities* differ from each other with regard to the barrier types *language* and *cognition*: While the language barrier (0) and the

cognitive barrier (0) do not apply to *people with learning difficulties*, *people with cognitive disabilities* have limitations with regard to both barrier types (0.5+1) due to their cognitive impairment, which particularly affect the access to text.

f) People with dementia-type illnesses

For persons suffering from dementia-type illnesses, the form of limitation depends to a considerable extent on the stage of the disease. The forms at the beginning of the disease are therefore less severe than as the disease progresses; the limitations increase and members of this group successively have less access to the reception of communication offers. For this reason, the focus here is on the mild and moderate forms of dementia-type illnesses. For this group neither a sensory barrier (0) nor a cultural barrier (0) can be identified. However, since various abilities are gradually lost as a result of cell degradation processes, which particularly affect cognition (1) and, with increasing severity, also language (0.5), memory disorders and changes in speech and language patterns are among the consequences (see chapter 3). Similarly, expert knowledge (1) and expert language (1) can no longer be adequately processed due to the degree of complexity. With regard to the media barrier, the phonic (0) and graphic (0) forms of realisation are initially not restricted, but with regard to the medium itself, a barrier must be named that concerns the factors mentioned at the beginning of this chapter, namely *age*, *infrastructure* and *preferred use of media or end devices*: content can only be received if it is available in a media-accessible form (see Mollenkopf/Doh 2002 and Rink 2020).

Overall, the barrier index of this group is 4.5, whereby a look at the table shows that this value is the same as that of the group of *persons with cognitive disabilities*. A deviation can only be observed with regard to the forms of the media barrier: While *persons with dementia-type illnesses* have no access to content that requires certain end devices or is not available in a preferred form, it is primarily the graphic realisation that represents a barrier for *persons with cognitive disabilities*.

g) People with aphasia

Depending on the severity and duration of the disease, persons suffering from aphasia are primarily limited in the linguistic modalities (speaking, understanding, reading, writing, see chapter 3). From this, barriers can be derived in relation to the language (1), the area of expert knowledge (1), the expert language (1) as well as the phonic (0.5) and the graphic (0.5) realisation of contents. For the remaining barrier types no limitation can be determined. Depending on the age of the persons concerned, a barrier in relation to the medium can be added.

Thus, this group achieves a BI of 4 out of 10 possible points.

h) People with German as a second language

People with German as a second language belong to a different language (1) and cultural community (1), which is why both corresponding barrier types apply here. The language-related limitations also have consequences with regard to content that is characterised by expert knowledge (1) and/or expert language (1). A certain level of (written) language competence is a prerequisite for understanding complex texts (see Bredel/Maaß 2016, chap. 5.2.9). For the other barrier types no limitations can be stated, so that the barrier index of this group is 4.

i) Functional illiterates

Finally, the heterogeneous group of functionally illiterate people will be discussed, which – as described in chapter 3 – forms a cross-structure (Bredel/Maaß 2016: 166) to the other groups of addressees. This group achieves a barrier index of 3, because expert knowledge (1) and expert language (1) as well as content that is available in graphic form (1) pose a challenge for this target group regarding the perceptibility and comprehensibility of texts. The other barrier types do not apply to functional illiterates, assuming that no other form of limitation exists.

A comparison shows that this group shares the relatively low barrier index of 3 out of 10 possible points with the group of *people with learning difficulties* (see table 2).

4.2 Barrier profile

The various rows of the table show the extent to which the different communication barriers represent a limitation in relation to the heterogeneous requirement profiles of the selected groups of addressees. The barrier profile enables a comparative view of the extent of the individual barrier types across the different target groups. The barrier profile can therefore be used to determine which barriers always need to be addressed or compensated for with regard to accessible implementation of texts (see chapter 5).

Type of barrier: The sensory barrier

With regard to the table, texts that are not available in a multimodal format constitute a barrier for persons with a prelingual hearing impairment and visually impaired persons as well as for persons with hearing and visual impairments. Impairments with regard to haptics are also conceivable, for example if information cannot be felt due to paralysis. In all these types of impairments, information of a certain modality cannot be received because the level of perception is limited. In recent years, more and more legal measures have been taken to lower such sensory barriers (see Lang in this volume and Rink 2020). The UN Convention on the Rights of Persons with Disabilities (2009) and the amended Act on Equal Opportunities for Persons with Disabilities (2016) specifically aim at the equal participation of people with disabilities and focus on their needs as a socio-political task. In the case of multiple disabilities, such as deafblindness or hearing and/or visual impairments associated with paralysis (for severe forms of multiple disabilities and correlating forms of accessible communication, see Folta-Schoofs' contribution in this volume), the texts must be edited with reference to all these impairments, otherwise they cannot be perceived. Media strategies in particular should be considered here.

For the remaining addressees listed in the table, no limitation can be found with regard to the sensory barrier. However, this does not exclude the possibility that additional reception variants, i.e. auditory, visual and haptic, would represent a benefit for representatives of these groups.

Type of barrier: The expert knowledge barrier

While the sensory barrier constitutes a barrier especially for hearing-impaired and visually-impaired persons, the expert knowledge barrier affects *all* the addressee groups listed in the table. Persons with cognitive disabilities, persons with learning difficulties, persons affected by dementia-type illnesses or aphasia, persons with a prelingual hearing impairment, persons with German as a second language and visually impaired persons often cannot access content containing expert knowledge because expert or content knowledge is a prerequisite for text comprehension (see chapter 3 and Rink 2020). The majority of content that belongs to expert-external communication exceeds the requirement profile of the recipients.

Type of barrier: The expert language barrier

Just like the category expert knowledge, the dimension expert language also poses difficulties of understanding for all addressees in the table (see table). As the content is in a special expert language that is used for communication among experts (see Kalverkämper 1998b: 34 f.), it generally poses challenges for recipients who are not experts in the subject (see chapter 3 and Rink 2020).

Type of barrier: The cultural barrier

In contrast to the *expert knowledge* and *expert language* barrier, the cultural barrier presents a barrier especially for people with prelingual hearing impairments and for people with German as a second language, because members of both groups belong to different (dia- or paracultural) communities (see chapter 3). Content can therefore not be understood or is misunderstood because culture-bound frames (see Bredel/Maaß 2016, Fischer 2011, Rickheit et al. 2010 and Groeben 1982), which are necessary to decode the semantics of the text, are not applied. While cultural knowledge can be acquired, this nonetheless requires appropriately prepared texts (see chapter 5).

Type of barrier: The cognitive barrier

The cognitive barrier poses particular challenges for recipients with cognitive impairments in receiving and processing information; according to the table, persons with cognitive disabilities and persons with dementia-type illnesses

are affected by this barrier. Due to the nature of the impairment, which can be congenital or acquired (see Bredel/Maaß 2016 chap. 5.2), complex linguistic and/or content-related information cannot be processed (any more) or not in their entirety. The specific requirement profile therefore demands a textual practice that takes such needs into account with regard to the cognitive barrier. An adaptation of the legal situation (see Lang in this volume) is a step in this direction.

Type of barrier: The language barrier

Language as a complex structure of different sign resources is a difficulty for many addressees. While people with German as a second language and a prelingual hearing impairment have a first language that differs from the German spoken and written language and therefore encounter challenges in relation to the category of *language*, the problem for people with aphasia, dementia-type illnesses and cognitive disabilities is rooted in the illness or impairment, which can make dealing with language itself considerably more difficult (see chapter 4.1 and Rink 2020). The barrier is more or less severe depending on the complexity of the linguistic code.

Type of barrier: The media barrier

The media barrier focussing on the media realisation of content can have different characteristics in the areas of *codality*, *modality* and *medium*.

The **phonic form of realisation** proves to be a barrier for persons with a prelingual hearing impairment because the level of perception is limited. For people suffering from aphasia, phonic realisation can pose difficulties with regard to the comprehensibility of information.

In contrast, **graphic realisation** is a barrier for almost all addressees included in the table: persons with cognitive disabilities, persons with learning difficulties, persons with a prelingual hearing impairment, persons with aphasia, persons with visual impairments and functional illiterates have limitations in this category (see chapter 3). Because the recipients have reduced literacy skills with regard to German, verbal content that is only available in a graphically realised form is not or not fully accessible.

Information that is not available in a **haptic realisation** poses challenges for visually impaired persons with regard to perception; haptic information reception is a priority for persons with combined hearing and visual impairments. Since the eye is not available as a sensory channel for information reception, content must be prepared in a correspondingly haptic and/or phonic realisation.

The **medium** as a carrier of information poses a challenge in terms of reception for people affected by dementia-type illnesses, the prelingually hearing impaired and visually impaired persons. Hearing-impaired and visually-impaired persons have a distinction in this category because the nature of their disability determines their preferred access to information via certain media (e.g. videos with subtitles/audio description, texts in Braille, sign language interpretation, etc.). Persons with dementia-type illnesses usually have a limitation in this category, which results from the factors *age*, *infrastructure* and *preferred use of media/end devices* (see Mollenkopf/Doh 2002). If the medium represents a difficulty, the corresponding contents cannot be perceived.

In comparison, it can be seen that hearing-impaired and visually-impaired people are particularly affected by the media barrier because content that is not available in a multimodal format cannot be perceived due to the limitation of (at least) one sensory organ (3 out of 4 forms in each case). With regard to the individual forms of the media barrier, it can be stated that graphic realisation represents the greatest difficulty with 5.5 points, because content that is realised in the form of text cannot be perceived and processed by many addressees with limited literacy skills. In contrast, information that is not realised in a haptic form poses challenges for people with visual impairments or people with combined hearing and visual impairments.

4.3 Barrier index

Following the qualitative examination of the correlation of communication barriers and forms of impairment, the focus will now be on the quantitative extent of the limitation and its impact: The barrier index as the result of interweaving the addressee level (horizontal) with the barrier type scale (vertical) shows that the barrier index or the requirement profile of an addressee group is higher the more communication barriers exist for an addressee group. In

other words: The more barrier types restrict access to information, the more comprehensive the applied strategies for compensation must be in relation to accessible and addressee-appropriate communication.

Of the groups of addressees considered in table 2, the **group of persons with a prelingual hearing impairment** has the highest barrier index with a value of 8: they are affected by all barriers in relation to the reception of content; only cognition does not represent a difficulty for this group of addressees. Due to their impairment, however, deaf persons have particularly high requirements for perceivable and understandable texts. Since this group of recipients does not have any cognitive limitations, the compensation strategies to enable communicative participation are primarily linguistic and media-based (see chapter 5); conceptual strategies are used when new knowledge about the texts has to be acquired, which is presumed in the source texts.

With a barrier index of 5, **persons with visual impairments** have the second highest value according to the table. The nature of the disability results in a special requirement with regard to the linguistic and media design of information, which is primarily aimed at the phonic and haptic realisation of texts (see chapter 5). However, conceptual strategies can also be effective, for example, when the context in which a text is placed is to be moderated or a text is outsourced (e.g. audio introduction).

If a person has a **hearing and visual impairment**, linguistic, media and conceptual strategies must be used to make the text perceptible and comprehensible.

A barrier index of 4.5 is achieved by **persons with cognitive disabilities and persons with dementia-type illnesses**. While members of both groups are affected by the expert knowledge, expert language, cognitive and language barriers and encounter challenges in this respect during reception, their requirements diverge with regard to the media barrier: persons with cognitive disabilities often have problems with the graphic realisation of text and a large part of this group has not mastered comprehension-based reading (see Bredel/Maaß 2016, Ratz 2013 and Schuppener/Bock in this volume, which, however, refer to the wide spectrum in the characteristics of the reading skills of this group). In contrast, people with dementia-type illnesses usually have average spoken and written language skills, but often fail to access information

through the medium itself (see Mollenkopf/Doh 2002). Factors such as age, infrastructure or preferred use determine how people deal with information, which is why content that can only be consumed through certain media (e.g. new media) is sometimes inaccessible to this group. In order to provide these target groups with communication offers that are perceptible, comprehensible and manageable, media, linguistic and conceptual strategies are required (see chapter 5).

For **people with aphasia** and for **people with German as a second language**, the barrier index is 4; it converges for members of both groups with regard to the barrier types expert knowledge, expert language and language (see table 2). There is a divergence with regard to the other barrier types: When it comes to the perception of phonically or graphically realised content, people with aphasia often founder at these levels of the media barrier due to their illness. Persons with German as a second language are less limited in this respect; the barrier for them rather lies in the absence of certain stocks of cultural knowledge that are necessary for understanding information. This is then where conceptual strategies are applied. In order to meet the communicative needs of these heterogeneous groups, media and linguistic strategies are also required with regard to accessible communication (see chapter 5).

The lowest barrier index with a value of 3 can be found for **people with learning difficulties** and for **functional illiterates**. Members of both groups face difficulties when content is characterised by expert knowledge and/or expert language and is additionally presented in a graphic form. In order to ensure communicative participation here, media and linguistic strategies in particular must be applied (see chapter 5). With reference to knowledge that is assumed in the source texts and is newly created in the accessible topics, conceptual strategies are also applied.

Within the framework of the quantitative evaluation, it became clear that the seven barrier types in their various forms are contrasted by three basic strategies for compensation. These are discussed in the following chapter.

5 Strategies to compensate for communication barriers

The barrier types that were introduced in chapter 2 impair communicative participation with regard to the perception of content and/or to their comprehensibility. There are three strategies to overcome those barrier types: linguistic, media and conceptual.

Linguistic strategies comprise all the measures that contribute to enhancing the comprehensibility of content at the word, sentence and text levels. For example, this involves the use of central words and sentence structures with a manageable number of letters, the use of a respective number of lexemes per sentence, the presentation of information by means of clear examples, the addressing, situating and action orientation or the introduction and explanation of complex, abstract or generally expert concepts (see Bredel/Maaß 2016: 520 ff.). In this volume, the publications by Hennies, Bredel/Maaß, Maaß, Mälzer/Wünsche, Benner/Herrmann, Otero Moreno, Zehrer and Maaß, LM deal with possible linguistic strategies for creating accessible media texts.

Medial strategies are aimed predominantly at perception, i.e. the perceptibility of the text surface. Different means of typographic structuring (text indents, mediopoint, highlighting) and interlinking (illustration, colour coding) can be used (Bredel/Maaß 2016: 520 ff.) to promote perceptibility and thereby information reception. If sensory organs are not available as perception channels for the absorption and processing of information, alternative channels must be used or chosen (e.g. subtitle, audio description, alternative text for graphics, Braille, text-to-speech systems, audio track, QR code, eye control, communicator, Lorm).

The media strategies thus aim at the multimodal processing of a text. In this volume, the publications by Alexander, Dobroschke/Kahlisch, Witzel, Folta-Schoofs, Schütt, Kurch, Benecke, Mälzer/Wünsche, Pridik, Hellbusch, Womser-Hacker, Capovilla and Schum deal with such medial strategies.

Conceptual strategies comprise those measures that aim to reduce the cognitive complexity of content. On the one hand, this can be achieved by means of linguistic and medial strategies or, on the other hand, by means of structural interventions that relate to the manner of presenting information

(see Christmann/Groeben in this volume). This includes for example metatexts that, in terms of advance organizers, provide information on a communication offer or on a digest about the communication offer (e.g. audio introductions, summaries in Easy Language, etc.) or that present the content of a text in a compressed form. It is also possible that contents change their medium as part of the multimodal processing – e.g. a graphically realised text can change its medium to a video realisation or an audio offer can be graphically realised. In this volume, the publications by Christmann/Groeben, Lutz, Maaß, Mälzer/Wünsche, Musenberg, Schädler, Hellbusch and Heidrich deal with conceptual strategies for the processing of media texts.

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Katrin Lang

The legal situation of accessible communication in Germany[1]

1 Introduction

Germany has a highly differentiated legal system consisting of more than 80,000 individual provisions (German Federal Ministry of Justice and Consumer Protection 2008: 16). The topic of accessible communication is also not exhaustively presented in a single legal text, but is presented in varying ways in countless standard texts or texts on its implementation. In addition to the complexity and intertextuality inherent in our legal system, one reason for this could be the fact that communication is an integral part of all areas of life and is consequently also reflected in many fields of law. Furthermore, the possibilities and means of accessible communication are constantly changing in the wake of new technological developments, which is taken into account in the corresponding legal texts. Another reason can be seen in the fact that the social and political efforts towards promoting equal opportunities and participation of people with disabilities are increasing and thus breaking new ground for inclusion of their interests in more and more standard text types (Aichele 2015: 90).

Concerning the rights of people with disabilities and accessible communication, Germany has made major progress in recent years (ibid.). If we consider the amendment of the German constitution to include the prohibition of discrimination against people with disabilities in 1994 as a starting point, however, this is a comparatively recent development. The intention of this article is to outline the current legal situation of accessible communication and

1 With many thanks to the Bundesfachstelle Barrierefreiheit for reviewing this article and for providing juridical hints during its preparation.

demonstrate how strongly the topic permeates the field of law. Therefore, the second part will offer fundamental insights into the structure of the German legal system and, using examples, elaborate in which standard texts the topic is situated. For those who work in the field of accessible communication, knowledge of the legal situation is important in order to recognize the implications for one's own area of work. Hence, in the third part, some of the central standard texts will be presented at various levels.

The legal texts on accessible communication that this article focuses on lie within the overlap area of three different domains (see figure 1):

On the one hand, they are both subject and expression of the efforts to achieve **general equal opportunities for people with disabilities**. However, the circle of potential beneficiaries of accessible communication – if we think of Easy Language as a means of communication for example – is certainly more extensive (e.g. people learning German, tourists, senior citizens; see chapter on target groups in Bredel/Maaß (2016)). The following examples provide an important legal basis for general equal opportunities and equal participation of people with disabilities and thus also for accessible communication:

- the previously mentioned **German constitution (Grundgesetz, GG),** which sets the constitutional basis for the prohibition of discrimination against people with disabilities in the second sentence of its 3rd section (subsection 3) ("No person shall be disfavoured because of disability"),
- the **Act on Equal Opportunities for Persons with Disabilities (Behindertengleichstellungsgesetz, BGG)**, which has regulated equal opportunities of people with disabilities in public law since 2002, i.e. the relationship between citizens and administration,
- the **General Act on Equal Treatment (Allgemeines Gleichbehandlungsgesetz, AGG)**, which constitutes the legal basis for equal opportunities of people with disabilities in private law,
- the **German Social Code (Sozialgesetzbuch)** and especially **Volume IX of the German Social Code (Sozialgesetzbuch, SGB IX)**, which regulates the social security benefits for people with disabilities

- and the **UN Convention on the Rights of Persons with Disabilities (UNCRPD)**, which calls for unrestricted participation and self-determination of people with disabilities in all spheres of life as a human right, and hence stands for a paradigm shift in international disability policy.

On the other hand, the topic of accessible communication extends into the field of **digitisation**, i.e. the increasing shift of services to the internet, and is found in texts on the accessible design of the respective programme interfaces and websites. The **Web Content Accessibility Guidelines (WCAG)**, the **Ordinance on Barrier-Free Information Technology (Barrierefreie-Informationstechnik-Verordnung, BITV)**, which will be discussed later, and **ISO 9241** ("ergonomics of human-computer-interaction") are examples of relevant normative texts in this field. Of these texts, however, only the BITV can be considered legally binding, whereas the WCAG serves as a recommendation and an ISO standard that is only legally binding when referenced by a law or regulation.

The third field that supplies particularly important legal texts for the topic of accessible communication is **administrative communication**. This concerns regulations of both the transmission of information between public authorities and citizens (e.g., on the decree of decisions or communication via the internet) and, to some extent, internal administrative communication (e.g., on submission of documents at court or the design of intranet pages). This results in a large overlap especially with the topic of digitisation and improvement of online communication in public authorities. Important legal texts that combine administrative communication and digitisation aspects are, for example, the **German E-Government Act (E-Government-Gesetz, EGovG)** or the **German Act to Improve Online Access to Administrative Services (Onlinezugangsgesetz, OZG).** The European Standard **EN 301 549** ("Accessibility requirements suitable for public procurement of ICT products and services in Europe") and the **EU directive 2016/2102 of the European Parliament and of the Council on the accessibility of the websites and mobile applications of public sector bodies** (hereafter referred to as Directive (EU) 2016/2102), which will be examined in greater detail under point 3, are of particular relevance for the field of accessible communication.

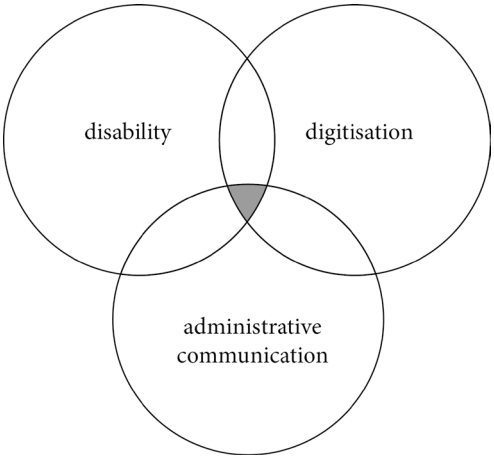

Figure 1: = relevant overlap area of accessible communication

The legal situation in the overlap area presented in the figure is characterised by strong topicality and dynamism and affects the working areas of many who deal with accessible communication. Hence, it constitutes the main focus of this article. Other legal areas, such as broadcasting (see Heerdegen in this volume) or further possible fields in private law are largely excluded.

2 On the subject of accessible communication in the context of the German legal system

First of all, we need to outline the different types of standard texts that exist in the German legal system and how they interact with each other:

The German constitution forms the peak of the national hierarchy of rules – all other legal texts may not contradict it. Beneath it, there are the German federal laws and regulations. The difference between the two lies in the body that adopts the legal rules: Laws are enacted by the legislative bodies as defined in the German constitution, i.e. the German Bundestag and the German Bundesrat. Regulations, which in the hierarchy of rules are below the laws, are enacted by the executive bodies, i.e. the German Federal Government, minis-

tries or state governments (German Federal Ministry of Justice and Consumer Protection 2008: 19). Moreover, laws and regulations exist both at the federal and state levels. Federal laws, due to their higher rank in the hierarchy, are the focus of the following explanations – if there are similar legal rules on federal and state levels, the rule applies that "German federal Law takes precedence over state law". Subordinate to laws and regulations are statutes and administrative provisions as types of norms, however, these will not be considered in this article.

2.1 Relevant legal texts on the federal level

On the federal level, the already mentioned German Act on Equal Opportunities for Persons with Disabilities (BGG) is particularly relevant for the topic of accessible communication. Although the BGG will be discussed further in chapter 3, it will already be mentioned at this point. Since it first came into force in 2002, the act has constituted the legal basis for accessibility in communication between citizens and administration and is therefore the core area that this article will focus on. In accordance with § 1 BGG, the administration is obliged to work towards the elimination of discrimination against people with disabilities. So far, the obligated parties on the side of the administration are public authorities in accordance with § 1 (subsection 2) sentence 1 BGG. This includes German Federal Authorities such as the Federal Motor Transport Authority or "corporations, institutions and foundations of public law connected to the Federation", such as the German pension insurance (Deutsche Rentenversicherung Bund). Section 1 (subsection 2) sentence 2 also indicates corresponding institutions at the state level, provided that they execute German federal law, such as institutions in the field of social law (for example, German Social Security Agencies limited to one state) or tax law. Although these institutions are obliged to comply with the prohibition of discrimination, they are currently not obliged to create accessible means of communication. Presumably, this situation will change with the implementation of EU directive 2016/2102 in September 2018, which will be discussed in more detail in chapter 3 of this article and which will entail changes in the BGG. At the time this article was prepared, however, the corresponding amending law had not yet been passed, so that only the current status can be presented here.

The obligation to eliminate discrimination against people with disabilities also results from the UN-Convention on the Rights of Persons with Disabilities (UNCRPD) which was ratified in Germany in 2009. Moreover, the legal foundations are accompanied by the corresponding guiding principles and government programmes (such as national action plans or the voluntary commitments in the coalition agreement of the 19th legislation period). In this way, over the past years, accessible communication has gradually entered all of these legal texts in which it makes a difference for citizens to either independently inform themselves or receive information from the administration in the field of public law.

Given the goal of an "inclusive society" as formulated by the German Federal Government in the national action plan on the UNCRPD, equal opportunities and thus accessibility are to be ensured in the long term in all spheres of life. However, unrestricted access to information seems particularly urgent in areas where the respective information (e.g., online election programmes, decisions, forms etc.) serves to exercise one's rights as a citizen (see for example Bock 2015). With regard to the current legal situation it should not go unmentioned that it seems quite possible that the private sector (e.g., service providers, traders, manufacturers) will also soon be obliged to implement accessibility measures. The General Act on Equal Treatment (AGG) has created the prerequisites for establishing equal opportunities for people with disabilities in private law and especially in the relationship between employer and employee. Section 5 of the German Act on Equal Opportunities for Persons with Disabilities (BGG) already opens up the possibility to oblige private companies to implement accessibility measures (e.g. in form of accessible websites) by means of target agreements. After an evaluation of the BGG by the German Federal Government in 2014, i.e. twelve years after its inception, this instrument of target agreement, however, has not yet shown the desired effects (BGG evaluation; final report 2014: 288 f.). At the European level, a European Accessibility Act has been in preparation since 2015 to commit private economic parties to enact accessibility measures – in English: "Proposal for a directive of the European Parliament and of the Council on the approximation of the laws, regulations or administrative provisions of the Member States as regards the accessibility requirements for products and services" (for the status of the

preparation as of 2017, see for example the official publication of the German Bundestag document no. 18/13258). However, as of February 2018, no final agreement and resolution on the draft has been reached between the member states.

2.2 The scope of legal texts affected by accessible communication

Since administration – unlike the private sector – is already obliged to ensure accessibility in many respects, there are laws and regulations in which accessible communication plays a role without disability or equal opportunities being the main object of the ruling. In addition, a variety of differentiations of the subject matter can be seen in legal texts, each with internal interdependence and different perspectives, such as for example:

- With a focus on the "addressees" (this refers, for example, to the user groups or types of disability taken into account in a regulation; on the (multiple) target groups of legal texts in general, see Baumann in this volume)
- With a focus on the required (communication) aids
- With a focus on the required technology in the authorities for establishing accessible communication (content management systems etc.)
- With a focus on different legal areas and/or on implementation by obligated parties (for example public law vs. private law)

Due to the complexity and scope of the legal system, an exhaustive description of the various regulations relating to accessible communication is not possible. To still emphasise the current spectrum of regulations and the respective subject areas as well as to illustrate the existing interdependencies, the following legal texts will be cited as examples that are particularly influential in this area at present and in the near future:

- The "Act to Improve Online Access to Administrative Services" (**Online Access Act, OZG**), which aims to improve digital access to administrative services for citizens in general. The OZG stipulates

that a central combined portal network with the bundled services of the federal, state and local authorities is to be set up by 2023 so that citizens can access all services from a central website in the future. According to § 3 (subsection 1) OZG, this includes that administrations ensure both accessibility in accordance with § 12 BGG, i.e. to guarantee a generally unrestricted usage of this combined portal network by people with disabilities, as well as compliance with the BITV (see point 3) in its respective current version (official publication of the German Bundestag document no. 18/11135: 92).

- The **German Competition Act (Gesetz gegen Wettbewerbsbeschränkungen, GWB)**, which contains provisions on the public procurement procedure if the tender is pan-European. It stipulates, among other things, that in certain cases accessibility for people with disabilities or a "concept for all users" must be taken into account when describing the services to be provided (§ 121 (subsection 2) GWB). The latter may be considered a step towards promoting so-called "designs for all" or "universal designs" according to § 2 of the UNCRPD. This concept refers to the usability of a product for as many user groups as possible without requiring adjustments to certain kinds of restrictions. The GWB also includes the "Regulation on the Award of Public Contracts" (**procurement law, Ger. Vergabeverordnung, VGV**), which stipulates that it may constitute an award criterion if the service offered by the competitor is made accessible to people with disabilities (§ 58 (subsection 2) (1) VGV). In accordance with § 11 of the VGV, the public procurement procedure itself and the electronic means used therein must also be accessible in the sense of the BGG and the BITV 2.0. In this way, possible restrictions on the part of competitors do not constitute an obstacle to submitting an offer.
- The "Act on the Promotion of Electronic Administration" (**E-Government Act, Ger. E-Government-Gesetz, EGovG**), intended to establish simpler electronic communication between administration and citizens or to remove legal obstacles on a federal level to simplify online services for the authorities to offer online services (official

publication of the German Bundestag document no. 17/11473: 2). This law, most of which came into force in 2013, makes it possible to use certain safe electronic procedures, for example for the provision of forms, data transmission and required user identification. It thus creates the prerequisites for people with reduced mobility, for example, to no longer have to go to the authorities in the long term, but instead being able to participate in administrative procedures from their home computers without outside help. According to the EGovG, access via internet websites and corresponding program interfaces shall become accessible in the sense of the BGG (official publication of the German Bundestag document no. 17/11473: 24).

- The **Act on the Promotion of Electronic Legal Communication with the Courts (German E-Justice Act)** is an amending law that aims to facilitate electronic legal communication in judicial proceedings and to dismantle access barriers (official publication of the German Bundestag document no. 17/12634: 1 f.). The different amendments refer to almost all laws and regulations related to judicial proceedings such as the German Code of Civil Procedure, the German Labour Courts Act, the German Social Courts Act, the German Code of Administrative Court Procedure and the German Federal Code for the Legal Profession. The amendments came into force or will do so in the period from 2014 to 2022.

In addition to the so-called DE-Mail-Infrastructure (DE-Mail-Infrastruktur) for safe transmission of electronic documents, other technological transmission channels are to be established and a "special electronic lawyer's mailbox" for each lawyer is to be set up to service judicial documents. In this context, accessibility is mentioned insofar as the transmission channels for electronic documents or, for example, the special electronic lawyer's mailbox have to be accessible. This means that accessibility is not only considered in communication between citizens and administrations, but also creates a claim before the courts, calling for uniform standards for all parties to the proceedings when submitting electronic documents to the court. Moreover, the law contains powers to issue statutory ordinances, which implies that the federal states as

well as the ministries shall give concrete form to the defined ordinances. This means that numerous further ordinances stem from the amending law, containing, amongst other things, more accurate regulations on the accessibility of registers as in the case of the German Code of Civil Procedure, of the lawyer's mailbox as in the case of the German Federal Code for the Legal Profession or on the transmission channels for electronic documents as part of all the mentioned laws. One example is the "Ordinance on the Technical Framework Conditions for Electronic Legal Transactions and on the Specific Electronic Mailbox" (**e-Justice Regulation, Ger. Elektronischer-Rechtsverkehr-Verordnung, ERVV**), which came into force on 1 January 2018 and refers to BITV 2.0 in terms of accessibility.

2.3 Relevant normative texts at additional levels

Furthermore, there are also legal acts beyond national borders, such as supranational treaties or EU regulations and directives, which also lead to laws and provisions at federal and state levels or modify existing law and thus have an influence on the German legal system.

International treaties or agreements have a special status in the hierarchy of rules. In accordance with the "directive for the wording of contract acts and contract-related provisions", they only become effective in the German legal system if they are agreed upon and implemented into national law. They then formally stand at the level of a German federal law. One particular example for such acts is the aforementioned UN Convention on the Rights of Persons with Disabilities, which is of great significance for equal opportunities for people with disabilities and the issue of accessibility (more under chapter 3).

While an EU regulation is binding and directly applicable for all member states, EU directives set out a goal that is to be achieved by all EU countries. However, it is the responsibility of the member states themselves to adopt the respective national legislation (German Federal Ministry of Justice and Consumer Protection 2008: 95). With regard to EU legal acts, domestic law must not contain any contradictions or loopholes, so that every German legislative act must be examined for its compatibility with the law of the European Union (ibid.: 93 f.). The aforementioned EU directive 2016/2102, for example, is especially important for accessible communication. More on this below.

For concrete implementation, the respective laws and regulations often refer to certain legal rules and standards at international, European or national levels, which thus also become binding in the respective context. In the field of accessible communication, the WCAG or the European Standard EN 301 549 are examples of this. The concrete implementation of the different regulations is in turn also often initiated via action plans or government programmes on EU, federal or state levels (such as eEurope 2005, National Action Plan (NAP), "gemeinsam einfach machen" [a federal initiative aimed at implementing the UN-CRPD]; overview at https://www.gemeinsam-einfach-machen.de) or in the form of specific instructions such as the "Style guide of the German Federal Government" (https://styleguide.bundesregierung.de/) or the "Guideline for an accessible administration" of the state of Hesse (http://www.brk.hessen.de/).

3 Main legal rules with regard to accessible communication

This chapter aims to present some of the aforementioned main legal rules that provide the legal basis for accessible communication in Germany (more of these texts can be found in Kerkmann (2015)).

UN Convention on the Rights of Persons with Disabilities

One of the most important regulations aimed at strengthening the rights of people with disabilities around the world is the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), published originally in 2006, which came into force in Germany in 2009 as the law "on the UN convention of the 13th of December 2006 on the rights of people with disabilities as well as on the Optional Protocol of the 13th of December 2006 on the UN convention on the rights of people with disabilities". By signing the international treaty, 176 states (status in February 2018 according to UN figures) have so far committed themselves "to promot[ing], protect[ing] and ensur[ing] the full and equal benefit of all human rights and fundamental freedoms for all people with disabilities" (Article 1 UNCRPD).

One of the main achievements of the UNCRPD is the international paradigm shift related to the understanding of a disability. The former deficit-oriented approach, attributing an impairment to people (in German formerly called "behindert sein", meaning actively being handicapped), has now been replaced by a notion of disability as an impairment that only comes into effect through interaction with barriers that exist in a person's surroundings (in German now called "gehindert werden", meaning passively being constrained by one's surroundings) (Degener 2015: 58).

The UNCRPD comprises 50 articles of which the first 30 can be considered the thematic main content. These include a general part as well as specific rights in different areas of life, e.g. education, health as well as work and occupation. The last 20 articles are of a formal nature and include specifications regarding the implementation and monitoring of this treaty.

Article 3 of the UNCRPD names eight fundamental principles including a number of important keywords that constitute the UNCRPD's overarching guidelines. These include respect for human dignity and the autonomy of the individual, non-discrimination, participation, diversity, equal opportunities and accessibility. This corresponds directly to the official German version of article 50 of the UNCRPD, which, however, is not one of the 'binding' language versions that have to be consulted in case of doubt in terms of interpretation of these principles (these languages include among others English, Spanish and Arabic) (Kerkmann 2015: 18). Central terms in the German discourse on disabilities such as "inclusion" instead of "integration" or "absence of barriers" instead of "accessibility" derive from the unofficial so-called "shadow translation" of the UNCRPD by the German Association *Netzwerk Artikel 3 e.V.* (2009). The wording of this alternative translation partially differs from the official translation, thereby aiming to achieve more social awareness. Further information on the subject of shadow translations can be found in Kerkmann (2015), among others.

In the signatory countries, the UNCRPD primarily applies to the public law sector. However, it also affects private law as, in article 4 (1)(e), the signatories commit themselves to take action to eliminate discrimination against people with disabilities "by persons, organisations or private companies" (Degener 2015: 58; English translation of the German original).

The subject of accessible communication can be found in the following sections of the UNCRPD:

In the preamble, letter v), unrestricted access to communication and information is described as a prerequisite for human rights and individual freedom. What is also important are the definitions in article 2, as the definition of "communication" here includes, e.g. Braille, tactile communication or Plain Language. Sign language is also recognised as an independent language here. Another important article is article 9, in which the English term "accessibility" was translated using the term "Zugänglichkeit" (accessibility) in the official German version and with "Barrierefreiheit" (absence of barriers) in the shadow translation of the UNCRPD. Similar to the German Act on Equal Opportunities for Persons with Disabilities (BGG), this article extends the term "accessibility" to the areas of communication and information. It obliges the signatory states to promote equal access to new information and communication services including the internet for people with disabilities (subsection 1(b) and subsection 2(g) and (h)). Furthermore, similar to article 4, article 9 obliges the signatory states to promote new developments and affordable technologies in the field of communication and information for people with disabilities. Article 21 comprises the right to access to "information intended for the general public" and the use of sign language, Braille and alternative forms of communications in dealing with public authorities. These are also increasingly being implemented in German law. Article 24 on "Education", subsection 3, commits the signatory states to ensure that support for people with disabilities in learning and using alternative forms of communication, Braille or Sign Language etc. is guaranteed. Currently, the various provisions are implemented in Germany to varying degrees. The least well implemented area is the area of information and communication by private operators (Bethke/Kruse/Rebstock/Welti 2015: 178 ff.).

Act on Equal Opportunities for Persons with Disabilities (BGG) and associated regulations

In 2002, the BGG, which has already been mentioned several times before, came into force. It applies to the area of the public law underlying the responsibility of the German federal government. This law aims to eliminate discrimination against people with disabilities and thus to implement prohibition

of discrimination as defined in the German constitution with regard to the German federal administration (official publication of the German Bundestag document no 14/7420: 1).

Regarding accessible communication, it is worth mentioning § 4 BGG in the version of 2002. Here, the term "accessibility" is explicitly broadened from its common use in general language, where it refers mainly to the context of structural installations. Instead this term is explicitly used for "systems of information processing, acoustic and visual information sources and communication facilities" that should be "accessible and usable for people with disabilities in their customary manner without particular complications and generally without external help".

Furthermore, § 6(1) BGG recognises German Sign Language (DGS) as an independent language and § 9(1) BGG grants people with hearing or speech impairment the right to use DGS, Sign Supported German (LBG) or "other suitable communication aids" for communication in administrative procedures. The administration has to assume the costs incurred. After a longstanding struggle for recognition, the German Deaf Association considers this a major milestone. However, this law still needs to be extended to private law (German Deaf Association e.V. 2012: 1). Details for § 9 BGG are laid down in the associated "Regulation on the use of Sign Language and other communication aids in the administrative procedure according to BGG" **(German Communication Aid Regulation (Kommunikationshilfenverordnung; KHV)).** Thus, the KHV, comprising five sections, includes regulations on the cases of application and the scope of the right to use communication aids. Furthermore, the regulation provides a definition of suitable communication aids and explains the principles by which they are provided and compensated or reimbursed.

§ 10(1) BGG specifies that in administrative procedures specific documents such as decisions, forms and general directions intended for people with visual impairments have to be provided in a "form that is perceivable for them". The corresponding "regulation on the accessibility of documents in the administrative procedure for blind and visually impaired people according to BGG" (Regulation on accessible documents in the German federal administration (Verordnung über barrierefreie Dokumente in der Bundesverwaltung; VBD))

contains further specifications. The VDB comprises six sections and regulates, aside from its areas of applications, the scope of entitlement and assumption of costs, as well as which documents have to be designed in an accessible format and which formats are permissible.

In 2016, the German Act on Equal Opportunities for Persons with Disabilities (BGG) was adjusted to the UNCRPD, adding § 11 'Comprehensibility and Easy Language'. This paragraph regulates the right to simple and comprehensible communication with public administrations for people with cognitive or mental disabilities. The limitation to these kinds of disabilities is not in line with current knowledge about which target groups could actually benefit from simplified communication (see the chapter on recipients in Bredel/Maaß (2016)). As of the 1st of January 2018, federal authorities and entities, or institutions and foundations of public law are obliged to explain upon request decisions, forms and general rulings to the aforementioned target group in a simple and comprehensive way. Should this simple 'explanation' not be sufficient, the affected persons have the right to request an explanation in Easy Language. However, unlike § 9 on the use of communication aids or § 10 on the accessibility of documents, § 11 does not contain an – enforceable – legal right for the affected persons to use Easy Language, but only the obligation for the authority to examine, upon request, if there is a need for Easy Language and, if necessary, to fulfil this need. However, the legislator does not specify which requirements the linguistic simplification and Easy Language have to meet and whether the explanations have to be provided orally, in writing or with written aids. This opens up a not insignificant room for interpretation for the affected authorities. At the present time, it still remains to be seen how exactly Easy Language will be implemented in these contexts. Furthermore, § 11(4) regulates that entities affected by this regulation are obliged to provide more information in Easy Language.

§ 12(1) BGG entitled "Accessible information technology" obliges public authorities to create their websites in a way that people with disabilities "can generally use them without restriction". However, it has to be clarified that "generally" in the legal sense does not mean "in every case" as it does in everyday language, but allows exceptions to this principle. According to subsection 2, certain internal administrative information, intranet pages and

electronic-based administrative procedures for the employees of German federal authorities and entities, institutions and foundations of public law also have to gradually be made accessible. More details on § 12 BGG can be found in the corresponding "Ordinance on the creation of accessible information technology according to BGG" **(Ordinance on accessible information technology (Barrierefreie-Informationstechnik-Verordnung; BITV))**, which will be discussed in more detail in the following paragraph.

Many federal states enforce German State Equality Acts (Landesgleichstellungsgesetze) based on the BGG and corresponding associated ordinances. An overview over the specific situation in each federal state is for instance available on the website of the German social organisation *Aktion Mensch* at https://www.einfach-fuer-alle.de/artikel/bitv/bgg/ or on the website of the monitoring department of the UNCRPD on http://www.institut-fuer-menschenrechte.de/monitoring-stelle-un-brk/monitoring/koalitionsvertraege/.

Ordinance on Barrier-Free Information Technology (BITV 2.0)

The first version of the Ordinance on Barrier-Free Information Technology came into force in 2002. It clarifies the requirements according to § 12 BGG for accessible internet pages, as well as publicly available intranet pages and other graphic program interfaces of authorities of the German federal administration as well as of institutions at the federal state level that exercise German Federal Law. The BITV is generally based on the widespread and internationally acknowledged recommendations of the Web Content Accessibility Guidelines (WCAG), which will be discussed further below. After the revision and update of the WCAG, the BITV was also amended accordingly and came into force in 2011 as the BITV 2.0. The required standards according to the BITV 2.0 are divided into two priority levels. The requirements in priority level I have to be met in all contents and internet pages by the obliged entities. The additional requirements of priority level II instead only have to be met in "central navigation and starter facilities" (§ 3(1) BITV 2.0). The BITV presents and differentiates four basic principles of accessibility in accordance with the WCAG: The web content has to be designed in a way that is 1. perceivable, 2. operable, 3. understandable and 4. robust, thus designed in an adaptive way so that it can be used with various assistive technologies. Therefore, according

to this principle and with regard to user groups who are restricted in various different ways, Appendix 1 specifies the necessity of providing alternatives for non-text elements, enabling the continuous operability via keyboard, enabling the possibility for variable adjustments of text size or font as well as implementing guidelines for contrasts and colours.

Apart from the areas covered by the WCAG, in § 3 subsection 2, the BITV 2.0 also regulates the aspects of language and comprehensibility by dictating that the homepages of intranet or internet sites have to include a certain amount of Easy Language or Sign Language. Appendix 2 gives concrete instructions for the implementation in Sign Language (part 1) and Easy Language (part 2), respectively. However, the instructions regarding the latter mostly refer to layout specifications – only five of the 13 specifications refer to the actual linguistic implementation.

Corresponding German federal state laws and ordinances are currently mostly based on the version of the BITV from the year 2002 in which, for example, the use of Sign Language and Easy Language had not yet been included as a condition.

Comments on current developments in this area as well as a critical discussion about the BITV can be found online in the publications by Hellbusch, e.g. https://www.barrierefreies-webdesign.de/, https://www.hellbusch.de/accessibility-checkliste/ or http://webkrauts.de/artikel/2011/bitv-20-kraft (see also Hellbusch in this volume).

Web Content Accessibility Guidelines – (WCAG) 2.0.

The WCAG are recommendations for the design of accessible web content by the workgroup World Wide Web Consortium (W3C) and were first released in 1999. They are addressed to the developers of web content and, following an amendment, the currently valid version was published in 2008 as the WCAG 2.0. Although the WCAG are not legally binding, they have nevertheless, as the preceding remarks show, now been included in various international and national regulations. Furthermore, in 2012 they were implemented in an international norm ("ISO/IEC 40500: Information technology – W3C directives for the accessibility of web content (WCAG) 2.0") (https://www.w3.org/2012/07/wcag2pas-pr.html).

The WCAG are constructed in a pyramidal form and are primarily based on the four basic principles already mentioned in the BITV, perceivability, operability, comprehensibility and adaptivity (for more details see Hellbusch/ Probiesch 2011). These basic principles are in turn specified in twelve technologically neutral "directives", which are, for example:

> "Directive 1.1 Text alternatives: Provide text alternatives for all non-text elements so that these can be changed into other forms that the user needs, such as large print, Braille, symbols or Plain Language." (WCAG 2.0 2009)

Or:

> "Directive 1.4 Distinguishable: Make it easier for users to see and hear content, including the separation of foreground and background." (ibid.)

Based on the twelve directives, 61 so-called "success criteria" are formulated that give detailed instructions on how to achieve accessibility. They read for example:

> "3.1.5 Reading level: When text requires reading ability more advanced than the lower secondary education level after removal of proper names and titles, supplemental content, or a version that does not require reading ability more advanced than the lower secondary education level, is available. (Level AAA)" (ibid.)

The success criteria of the WCAG 2.0 are assigned to a compliance model consisting of three levels. Level A has the lowest requirements. In total, 25 success criteria are assigned to this level. The medium level AA comprises 13 success criteria. In order to achieve the highest compliance level to the WCAG 2.0, called level AAA, 23 further success criteria have to be met.

The German BITV has simplified the WCAG compliance model to two priority levels. Here, the WCAG 2.0 levels A and AA correspond to the BITV 2.0 priority level I and the WCAG 2.0 level AAA corresponds to the BITV 2.0 priority level II.

Today, 10 years after the publication of the latest version of the WCAG, a draft for the further development of the recommendations now also exists, called WCAG 2.1. It contains around 30 new success criteria and increasingly addresses the requirements of visually impaired users and users with a learning disability, respectively (https://www.w3.org/TR/WCAG21/). According to W3C, the release was scheduled for June 2018 (status in February 2018: https://www.w3.org/blog/2018/01/wcag21-cr/).

EU directive 2016/2102

At the European level, the "EU directive 2016/2102 of the European Parliament and the European Council of the 26th of October 2016 on barrier-free access to web pages and mobile applications of public authorities" has been passed. By the 23rd of September 2018, it has to be implemented into national law and will thus result in changes to the BGG. Accordingly, new web pages of local authorities (thus of the German national government and now also of the federal states, administrative districts and municipalities), of bodies governed by public law (e.g. universities, health insurance companies, churches, trade associations, craft associations) and respective associations have to be accessible by September 2019. Some exceptions on the part of the obliged entities are also listed. Thus, for example, the directive does not apply to public service broadcasters and, in certain circumstances, does not apply after considering the "proportionality" between the effort for the public body and the benefit for the people with disabilities. Also excluded is certain content such as live broadcasted time-based media or third party content, which is neither financed nor developed by the public body and is beyond its control. Web pages and mobile applications that already existed before September 2018 have to meet the necessary accessibility requirements from September 2020 and from June 2021, respectively. In addition, 'office applications' (e.g. PDF or Word files) published after the 23rd of September 2018 have to be accessible by then.

The EU directive 2016/2102 is based on the European norm **EN 301 549** ("Accessibility requirements suitable for public procurement of ICT products and services in Europe") as a technical standard. This norm in turn is based on the WCAG 2.0. In the future, the corresponding pages have to contain a "declaration on accessibility" and a "feedback mechanism" for users. Further-

more, every member state has to review the implementation of the directive via a monitoring method that has to be determined, such as an expert analysis or taking samples. Every member state is obliged to report to the EU Commission every three years on the results of this monitoring. The first report is due in December 2021. From September 2018 on, the member states are also obliged to name a body that is responsible for the implementation of the directive on the national level to the Commission.

German Social Code and German Federal Participation Act (Bundesteilhabegesetz)

An essential German federal law on the issue of disability is the German Social Code, consisting of twelve books. It regulates social security benefits and welfare benefits, respectively, for people with disabilities, but also for people without disabilities.

The First Book of the German Social Code (SGB I) can be seen as a "general part". It first came into force in 1976. SGB I, which is not targeted at a special group of consumers, specifies the basic principles of social law as well as different service types and responsibilities. It also addresses the accessible use of the indicated services. According to § 17(1) SGB I, social security institutions are obliged to simplify access to welfare benefits as much as possible, e.g. "by using generally comprehensible application forms" and removing communication barriers and physical barriers. Furthermore, subsection 2 regulates that people with hearing or speech impairments have the right to use Sign Language or "other suitable communication aids" "during the implementation of welfare benefits, especially during medical examinations and treatments" at the expense of the responsible service provider.

Furthermore, since the 1st of January 2018, § 17(2)(a) SGB I has specified that while implementing welfare benefits the aforementioned § 11 BGG on Easy Language also has to be applied. The responsible bodies according to SGB I are listed in §§ 18 to 29 SGB I. They range from the offices for educational support of the administrative districts and district-free cities to accident insurers and municipal health authorities or the bodies of districts, district-free cities and municipalities responsible for youth welfare. Thus, the bodies obliged to explain certain decisions, general directions, contracts and forms in Easy

Language listed in the German Act on Equal Opportunities for Persons with Disabilities (BGG), namely federal authorities and provincial authorities carrying out federal law are expanded to all bodies that provide welfare benefits under the SGB and thus also under the authorities of the deferral states and municipal authorities.

The tenth book of the German Social Code (SGB X), more precisely § 19(1)(a), contains this expansion. This book regulates the social administrative procedure that is the work of an authority "examining the conditions, preparing and issuing an administrative act or concluding a public law contract" (§ 8 SGB X). Within the meaning of this law, an authority is "every entity performing public administrative functions" (§ 1(2) SGB X). Thus, § 19(1)(a) SGB X referring to § 11 BGG constitutes a potentially far-reaching extension of the entities obliged to use Easy Language.

The ninth book of the German Social Code (SGB IX), which came into force in 2001 in its first version, specifically regulates the different types of welfare benefits for people with disabilities. According to § 164(4) point 4 and 5 SGB IX they are, for example, entitled to an individually tailored disability-friendly working environment, including information and communication technology (e.g. intranet pages). Furthermore, § 209 SGB IX contains the legal basis for the granting of concessions for people with disabilities. For example, in the field of education this is also possible in the form of communication aids (e.g. linguistically simplified examinations; see also Rink 2014).

Due to the "Law on the strengthening of the participation and self-determination of people with disabilities" (German Federal Participation Act (Bundesteilhabegesetz, BTHG)) profound amendments will gradually be made in the period from 2017 to 2023. These amendments concern the modernisation of the German Social Code and above all of SGB IX with the aim of further developing the German national disability policy in accordance with the UNCRPD. Furthermore, this law aims to strengthen the position of people with disabilities as beneficiaries. Important points in the BTHG are, in addition to the adjustment of the terminology used for people with disabilities in accordance with the UNCRPD, also the restructuring of integration aids towards more self-determination and participation in decisions of those affected as well as more participation in working life.

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Kerstin Alexander

Accessible graphic design

The aim of graphic design is to enable simple and target group-oriented information transfer with the help of a consistent system of form, colour and structure. Accessibility is thus its goal per se. In typography and layout, graphic design visualises language, while in images it can also add information to language (see van Leeuwen 2005; Stöckl 2011). Graphic design conceptualises a didactic concept that, when implemented, aims to provide its recipients with information that is as accurate as possible and in line with expectations (see EN ISO 9241-Part 110, Dialogue principles).

A consistent graphic concept does not overburden the readers' working memory and enables a relaxed reading experience. Readers consider a well-designed layout attractive and it motivates them to read. Beautiful is what works. This principle applies to Easy Language and Plain Language products in the same way as to standard language products.

But why can we then not simply apply the microstructural criteria for good graphic design (see Alexander 2013: 51–62) to Easy Language?

Why do we have to rethink the design rules and compare them to the practical experiences that the German organisation Netzwerk Leichte Sprache (Network Easy Language) included in its rules for Easy Language? In this article, it is assumed that the reader is familiar with the recommendations of the Netzwerk Leichte Sprache, Inclusion Europe and of the Federal Ordinance on Barrier-Free Information Technology (BITV 2.0) (see Bredel and Maaß 2016: 110 ff.). Therefore, the visual rules will only be briefly summarised in the following table.

Typography rules	Layout design rules	Image design rules	Rules related to the use of images
• simple, sans-serif fonts • only one font • minimum font size 14 pt • text highlights: ◦ using darker font colours ◦ using a light-coloured background ◦ using bold print • no highlights using all caps or italics, no underlining	• clear contrast between writing and paper • many paragraphs and headings • bullet points • framing • each sentence in a new line • 1.5 line spacing • left-aligned • no division of words at the end of the line • no justification	• use images • use images that match the text • use sharp and clear images	• when using images, make sure that they are recognisable and copyable: ◦ by using a matte paper surface ◦ by using sharp and clear images • do not use images as background for text

Table 1: Visual rules of the Netzwerk Leichte Sprache (Network Easy Language) according to the Federal Ministry of Labour and Social Affairs (BMAS) (2014)

In visual communication, all graphic rules are based on the Gestalt laws (see Arnheim 1954). At the beginning of the 20th century, representatives of the Berlin school of Gestalt psychology developed "Gestalt theory" as a new direction in psychology. The scholars drafted more than 100 rules that define how the human brain processes visual stimulations (see Alexander 2013: 25–31). Without this consistent assessment of information, reliable visual communication would be impossible.

A designer uses these rules during the design process. For example, according to the Law of Proximity, the brain processes elements that are spatially close to one another as a group of related concepts. This Gestalt law enables the average person to understand the link between texts and images in horizontal arrangements or columns, to assign titles to the following segments and to associate images with their captions (see Alexander 2013: 25 ff.). All spacing rules in layout are based on this Gestalt law. According to the Law of

Similarity, the brain builds a relationship between similar elements. That is why designers depict titles of the same hierarchical level with the same form and colour, structure the layout with standard elements such as page numbers, column titles or pictograms and use colours to create structure in illustrations.

The limited perception and processing abilities of the heterogeneous user group of "people with learning difficulties" challenge the expected effect of the Gestalt laws. We cannot be certain that our interlocutor is able, in accordance with the Law of Simplicity, to associate image details with the whole, to recognise the meaningful link between colour structures according to the Law of Similarity, to arrange a picture sequence correctly following the Law of Continuity etc. This leads to a desideratum with a considerable potential for research.

Studies at the University of Applied Sciences Merseburg on typography and layout, text structure, display formats, text-image integration and picture function represent the attempts of prospective information designers to close this research gap. These studies originated in practical experience with accessible graphic design and use findings from pedagogical psychology and media studies. All studies were tested with participants with learning disabilities, resulting in hints on how to improve accessible graphic design.

1 Typography and Layout in accessible graphic design

Put simply, typography (also known as micro typography) aims at making a font perceptible and legible. Layout refers to the relationships between font, structural elements, images and the white space surrounding them. Layout is also referred to as macro typography. The typographic recommendations of the German standard DIN 1450 (2013) for good legibility were the starting point for research on typography at the University of Applied Sciences Merseburg. While the former DIN 1450 essentially addressed legibility in public spaces, the revision in 2013 now also includes information on legibility in books, pamphlets and newspapers. DIN 1450 differentiates between a total of four types of text: reading text, consultation text, signalling text and display text. The study by Rohde and Stechert (2016, see Alexander 2017: 318 ff.) focuses on reading

texts. DIN 1450 defines criteria of good legibility for each of these text types and makes recommendations for legibility in a practical context. However, there are serious shortcomings in how to apply these recommendations in practice. Firstly, the criteria are relatively abstract and therefore rather unsuited for "non-typographers". Secondly, the recommended fonts are outdated and not free of charge. Shortly after publication of the new standard, the Neue Frutiger 1450 font, designed according to DIN 1450 and optimised with regard to accessibility, was launched. It has a high degree of recognisability, but is cost-intensive.

The study by Rohde and Stechert (2016) compares four free open source fonts with the Neue Frutiger 1450, based on the criteria of the DIN 1450. In the results of their study, Rohde and Stechert recommend the test winner, the open source font Open Sans for reading texts. Therefore, they determine that free open source fonts can also meet the requirements of accessible typography. Due to the minor distance to the test winner, the second- and third-placed fonts Fira Sans and Roboto also satisfy the accessibility requirements for reading in printed form and on the computer. In addition to the question of the correct font, a professional typesetting technique can also contribute to the easy recognition and differentiation of glyphs. A good document font, e. g. Myriad Pro, has alternate glyphs such as a zero with a slash to easily differentiate between the number and the upper-case O.

Liquid layout and responsive design are novel challenges for accessible graphic design. When asked what he considers important for responsive typography, Kupferschmid answered: "With regard to the font: good rendering, uniform stroke widths, rhythmic hallmarks that are not too narrow, moderate to large x-height, clear inner forms and punctuation marks, kerning, well-accented letters." (Kupferschmid 2014: 5; English translation of the German original). Font and layout recommendations for reading on smartphones and other mobile devices remain a research desideratum.

The study by Demagin, Donner, Kutschera and Thieme applies a usability test to investigate how typographic structural elements can influence and improve the clarity and comprehensibility of a text in Easy Language (see Fig. 1). Macro typography determines the overall impression of the text by structuring, organising and visually highlighting information. Certain arrange-

ment patterns are repeated over and over, so that the reader can already get clear information about the type of text based on the outer form (see Hochuli 2011: 7). To this end, the layout of a text, set according to the rules of Easy Language, was modified.

Die Hilfe für Menschen mit Behinderungen in der Europäischen Union

Das ist die Europäische Union

Deutschland ist ein Land.
Deutschland ist in der Mitte von Europa.
Das ist ein Teil von der Welt.
Europa hat viele Länder.
Zum Beispiel: Deutschland.
Und Frankreich. Und Spanien.
Und noch viele andere Länder.
28 Länder in Europa arbeiten eng zusammen.

Sie sind eine Gruppe.
Die Gruppe heißt: Europäische Union.
Das kurze Wort dafür ist: EU.
So spricht man das: ee u.

Was für Hilfe gibt es?

Für Menschen mit Behinderungen
gibt es besondere Arbeits-Plätze.
Wenn sie nicht in einer Firma
arbeiten können.

Menschen mit Behinderungen
brauchen oft Hilfe mit Geld.
Die Länder in der EU helfen deswegen
zum Beispiel mit Geld:
Wenn ein Mensch nicht arbeiten kann.
Oder wenn ein Mensch nicht
für seine Medikamente bezahlen kann.

Leichte Sprache erklärt alle Infos
auf einfache Art.
Zum Beispiel mit: Kurzen Sätzen.
Einfachen Wörtern.
Großer Schrift.
Und Bildern.

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Das kurze Wort dafür ist: EU.
So spricht man das: ee u.

Was für Hilfe gibt es?

- Für Menschen mit Behinderungen
  gibt es besondere Arbeits-Plätze.
  Wenn sie nicht in einer Firma
  arbeiten können.

- Menschen mit Behinderungen
  brauchen oft **Hilfe mit Geld.**
  Die Länder in der EU helfen deswegen
  zum Beispiel mit Geld:
  Wenn ein Mensch nicht arbeiten kann.
  Oder wenn ein Mensch nicht
  für seine Medikamente bezahlen kann.

- Leichte Sprache erklärt alle Infos
  auf einfache Art.
  Zum Beispiel mit: Kurzen Sätzen.
  Einfachen Wörtern.
  Großer Schrift.
  Und Bildern.

Figure 1: Comparison of typographic structuring elements (Source: https://Rat-Geber für Menschen mit Behinderung in der Europäischen Union (BMAS 2017); Study: © Donner/Demagin/Kutschera/Thieme, University of Applied Sciences Merseburg (2017)

Following the recommendations of the typographers Willberg and Forssman, a horizontal line was inserted after the main heading to emphasise the hierarchical order (see Willberg/Forssman 2010).

A line spacing of 135% was chosen so that individual paragraphs become better recognisable as a unit of sense. Moreover, the spaces before and after the subheadings were changed. There are three blank lines before and one blank line after the subheadings. This highlights the affiliation to the respective following section (see Willberg/Forssman 2010: 200). The font size was increased from 18 pt to 20 pt.

The main heading as well as the subheadings were marked in green. As an additional structuring measure, the corresponding text of both subheadings was indented and marked with a black vertical line on the left of the beginning of the line. Furthermore, the beginnings of all paragraphs after the second subheading were marked with a dot. Search terms were written in bold.

Both texts were assessed in a reading test to evaluate the required reading time and complemented with questions on text overview and text comprehension (see Demagin/Donner/Kutschera/Thieme 2017: 6). The results showed a significant increase in reading speed for the optimised text. However, in regard to the questions about text overview and text comprehension, the test participants performed significantly worse in the optimised text than in the source text. Since the text had been modified a significant number of times, it is not possible to determine which structural element caused a barrier for text comprehension. One possible conclusion is that unusual structuring elements may help with reading, but tend to fluster participants when searching for information.

In their studies on the typography of documents, Lange, Römer and Schneider (2017) explained that the participants are strongly conditioned by the sentence structure defined in the rules of Easy Language. When asked to decide between two pamphlet covers, 57% of the participants chose the unoptimised version with a significantly less attractive title layout, and only 43% the optimised pamphlet title with the colourful umbrella (see Fig. 2).

Figure 2: Pamphlet cover, comparison between the old and new design (Source: Child and Adult Protection Authority (KESB)* (ed.) (2016): Information zum Erwachsenenschutz in leicht verständlicher Sprache (Information about adult protection in Easy Language). Solothurn; Study: © Lange/Schneider/Römer, University of Applied Sciences Merseburg 2017)

Some of the participants reached for the plain white cover of the original pamphlet and justified their decision with the words: This is the one that is meant for us. They did not feel like the colourful cover was aimed at them. Furthermore, it is obvious that they did not recognise the metaphor of protection symbolised by the umbrella. Exemplified image competence cannot be assumed in the case of learning disabilities (see Posner 2003: 20).

The comprehensive pamphlet on adult protection was structured using a table of contents with colourful logograms to differentiate between the chapters. The colours as well as the logograms appeared again in the respective chapter titles to make them easier to find (see Fig. 3).

When asked about the original pamphlet, "What is the meaning of the colours in the table of content", 36% of the participants were able to recognise the meaning of the colour, while the other 64% were not.

When asked about the optimised pamphlet, "Why do you think symbols and colours are used in the table of content?", 57% of the participants could understand the meaning of the colours and the pictograms*, while 43% could not.

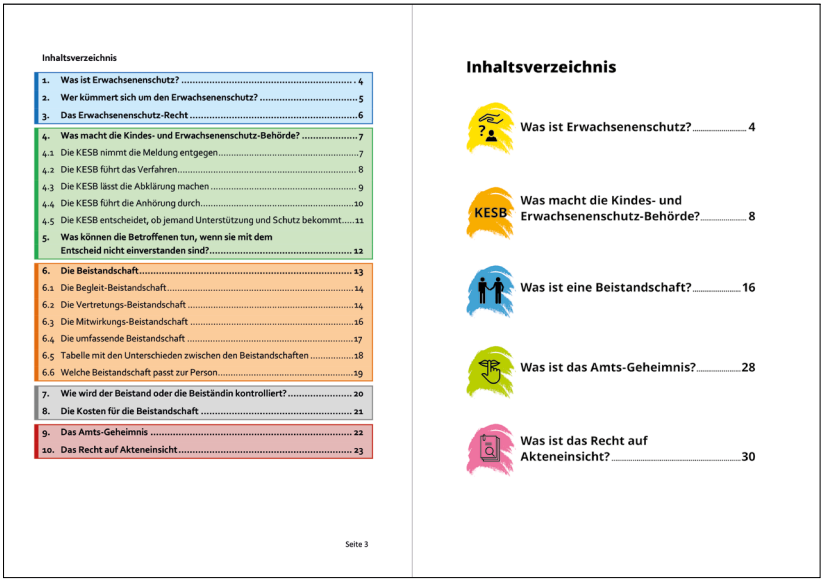


Figure 3: Colours and symbols as structuring elements of a pamphlet, comparison between old and new design (Source: Child and Adult Protection Authority (KESB) Region Solothurn (ed.) (2016): Information zum Erwachsenenschutz in leicht verständlicher Sprache (Information about adult protection in Easy Language). Solothurn; Study: © Lange/ Schneider/Römer, University of Applied Sciences Merseburg 2017)

The participants could only complete the task "Find out who pays for this type of assistance" by using the table of contents.

No one could find the requested information in the source document without help. In total, 41% of participants could find the information with help, 42% only partially succeeded despite help and 17% did not succeed at all.

In the optimised document, 7% of the participants could find the specific information without help and 14% found parts of the information without

help. With help, 22% were able to find the information. On the other hand, 50% could not find it despite assistance.

As a result of the study, it is possible to conclude that the use of pictograms (signs abstract in form and colour with a stimulating character) improved the clear presentation of the pamphlet. Colours alone do not suffice as structuring elements.

In their notes on the usability tests, Lange, Römer and Schneider (2017) wrote that participants read through the pamphlet from front to back – including the imprint if it followed the heading. Others read only the text block and ignored the headings. Still others confused page numbers with chapter numbers.

These results lead to the conclusion that the effect of typographic structuring elements as used for standard language can only be transferred very sparingly to products in Easy Language. The spacing rule constitutes such typographic precision work. The rules of Easy Language recommend the use of many paragraphs and headings; thus it is beneficial to pay attention to the spatial distance between titles and the following text in order to preserve the text overview. Thus, readers visualise a sense of togetherness based on the Law of Proximity, almost without realising it (see Alexander 2013: 27). It is striking how often one encounters long, even three-line headings in texts in Easy Language. This has a negative effect on the reader's ability to grasp the heading content. Short headings, which may also be emphasised with a bold font, are a more attractive way to start the reading process.

Interest in the reading material is of major importance for reading performance. Motivation and reading habits are therefore significant legibility criteria. "We read well what we are used to reading – and even better what we want to read" (Uebele 2013: 9; English translation of the German original).

Layouts compliant with expectations according to the rules of Easy Language can help poor readers to read, but at the same time they also condition the reader to read specific recommended elements (see Lange/Römer/Schneider 2017; Demagin/Donner/Kutschera/Thieme 2017).

One should not underestimate the dangers of exclusion as a result of conditioning however, particularly with regard to the introduction of typographic elements that do not occur in standard typography.

2 Visual communication in accessible graphic design

"Use images. Images help to understand a text. The images must match the text." (BMAS, 2014; English translation of the German original). The Netzwerk Leichte Sprache as well as Inclusion Europe and the Federal Ordinance on Barrier-Free Information Technology specify that meaningful images and symbols should be used (see Ordinance on Barrier-Free Information Technology, BITV 2.0), and that the image media should still be easily recognisable even after being photocopied and not be used as the background (see BMAS, 2014).

While the requirements for sharp, copyable images can be easily met, every reader is faced with the question of what meaningful images and symbols really are. On this point, Maaß writes the following:

> "In Easy Language texts, they (images) should support complex or even central concepts. They should represent the important information again in a different code. Images in Easy Language texts are therefore not meant to embellish or illustrate the text, but rather to support the understanding process." (Maaß 2014: 153; English translation of the German original)

The representation of the non-mutable image characteristics (invariants) (see Böck, Wünsche 2013), the image function, the type of text-image relation and the image quality determine whether an image has a positive effect on understanding in the corresponding context. If there were meaningful images per se, they could be stored in image databases and the writer would only have to select them accordingly. How can one tell if an image matches the text? Does it suffice to depict a block of houses when discussing a polling station? Is an image that is only marginally helpful (like that of the block of houses) better than no image at all? Is it at all possible to visually refer to the individual experiences and ideas (e.g. of the polling station) of a heterogeneous readership? Visual communication is a broad specialist field that becomes even more complex when applied to the target group of Easy Language. Therefore, the special features of visual communication will be presented in the following.

2.1 Advantages and limits of visual communication

Visual communication has specific characteristics that differ from the characteristics of linguistic communication.

> "For as an ever both external and internal image, the image ultimately remains bound to the subject and thus eludes any kind of repeatability or determinability. In the state of indeterminability, the image will always remain a mystery that we can approach, where, as an external image, it allows us to communicate with it on a multi-personal level." (Kregel 2011: 33; English translation of the German original)

This means that even if we all went to a block of houses to vote, everyone would have their own concrete image of that block in their head.

Images are not self-descriptive per se, even if this is sometimes claimed. Due to their polysemy, a context and/or a convention is required in order to understand the information. Pictures have special communicative possibilities that are equated to a property and described as "self-descriptive" by laypersons. "Diagrams create images for quantities. Logos create images for abstract contexts" (Alexander 2013: 131; English translation of the German original). Silhouettes promote the recognisability of the image objects. "The strength of the image lies in its ability to find a memorable image for complicated situations" (ibid.). Designers strive to elaborate these communicative possibilities. But beyond images with high iconicity, such as photography, highly stylised types of images such as pictograms (indicative signs) and graphic symbols (conventionalised signs) are learned image by image (see Alexander 2013: 209 ff.). External images are understandable, provided that the designer and the recipient share the same social, professional or other conventions. This possibility of comprehensibility exists across all languages.

According to Doelker (1997/2002: 52–60), four characteristics describe the particularities of visual communication in comparison to linguistic communication: 1) ambiguity, 2) range from concreteness to similarity, 3) spatiality and 4) immediacy of the emotional effect.

In addition, there are also the advantages of image processing in the brain.

"Effortlessness and speed of image processing are also essentially determined by the fact that, in contrast to language, a recoding of perceptually distant signs (phoneme or grapheme sequences) in perceptually close signs is omitted" (Stöckl 2011: 49; English translation of the German original). Images can be perceived and recognised in no time at all. It often only takes a hundredth of a second to grasp the most important basic information or the subject of an image. It is possible to reliably recognise a picture again after about two seconds (see Behrens, Hinrichs 1986: 85). Compared to text, images are stored particularly quickly and efficiently, but also with virtually unlimited capacity (see Schweiger 1985: 229).

As stated in Paivio's empirical studies (1971), images owe this extraordinarily high recognition value to the phenomenon known as the "Picture Superiority-Effect". According to Paivio (here in the words of Schierl 2001), this can be traced back to the fact that "the linguistic code can be translated into a pictorial code and vice versa. Concrete images are double coded very easily according to this approach and are therefore also very easily transferred to memory" (Schierl 2001: 202; English translation of the German original).

Visual communication has limits.

> "One result of semantic density is the excess of meaning in images, especially in terms of connotation. The message of an image is therefore difficult to determine; it can consist of many activatable individual statements and observed perceptions. The semantic scope of pictorial representations is limited in several respects. Thus, clear negations are not possible, modality (e.g. could, want, must etc.) cannot be adequately expressed, concrete and unambiguous speech acts cannot be carried out and individual image statements cannot be clearly, logically and rhetorically (e.g. because, after, although, therefore etc.) linked together." (Stöckl 2011: 50; English translation of the German original).

2.2 Problems of visual communication in accessible graphic design

Readers with learning disabilities also benefit from visual communication. "In their research overview of effects of illustrations, Levi and Lentz (1982) came to

the conclusion that 'illustrations can be more helpful for those with reading difficulties than for ordinary readers' (Levie/Lentz 1982: 226). They report that, in the reviewed studies, text retention improved on average by 44% among those with reading difficulties and by 23% among ordinary readers when illustrations were used" (Peeck 1994: 76; English translation of the German original).

In the same article on "Knowledge acquisition with descriptive images", Peeck provides examples of the affective and motivational function of images for learning. "But many illustrations are also directly relevant for learning and should motivate people to read and increase the time that readers engage with text etc." (Peeck 1994: 60).

People with reading difficulties benefit from being encouraged to engage with texts just like the "compensative" function that is attributed to images during reading (see Levie/Lentz 1982).

Graphic symbols (like the symbol for Easy Language, pictograms like the magnifying glass symbol for font size setting, the speaker symbol for the read-out-loud function) play a very important role in accessible web design, in public spaces (pictograms for accessible toilets or accessible entrances) but also in printed media (logograms for chapter structuring). These signs are particularly easy to remember as their meaning is formally reduced and focused on the essential. The results of the study on the comprehensibility of visual representation modes by Magaschütz, Schünzel and Teube (2014) demonstrate this as well. The study compares the representation modes of different similarities: Photography, line drawing, pictogram. The participants with learning disabilities could choose between drawing, photography and black-white pictogram in the definition of image allocations. All representations visualised the same concept. Pictograms for concept assignments were chosen most frequently. Symbols and pictograms can only display their signal effect if many people know them. They have to be conventionalised. The distribution rate helps conventions to slowly become established. Accessible graphic design is not about constantly developing new signs but screening for and using strongly conventionalised signs. Communication using PCs and smartphones, operating systems, programmes and apps set the tone in conventionalisation. Bien and Schmidt (2017) analysed the degree of conventionalisation of pictograms among the average population by means of "card sorting". The test persons

named their favourite pictogram among five different pictograms related to one topic. The topic "accessible" indicated that no specific pictogram has yet prevailed among the age groups of under 35 as well as over 35.

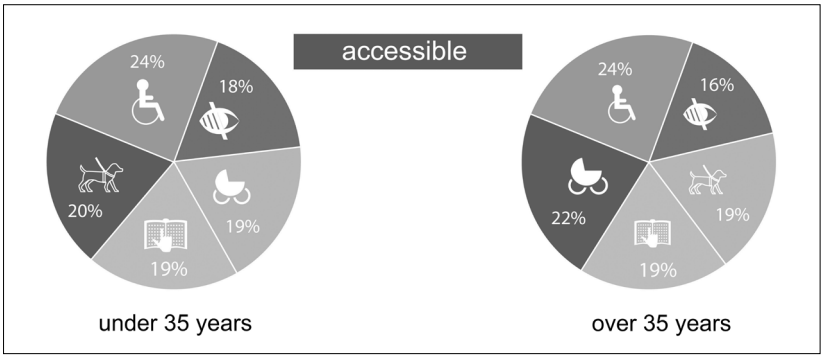


Figure 4: "Accessible", comparison of five pictograms (Source: Study: ©Bien/Schmidt, Merseburg University 2017)

Despite all the advantages of visual communication, in practice finding the most meaningful image for a text-image combination to resolve difficult content is still difficult. The information in text and image must support each other to an individually meaningful degree. Alexander refers to this as a redundant, complementary and discrepant relationship between the text and the image (see Alexander 2013: 74 ff.). Bredel and Maaß (2016: 273) speak of matching and images in the different degrees of convergence.

The difficulty for information transfer in accessible design consists more particularly in matching abstract contents with pictures.

Paivio (1971,1977) makes an important reference to this with what he calls the "Picture Superiority-Effect". Concrete terms can be coded twice and thus illustrated relatively easily. But especially when it comes to imparting abstract content, texting becomes difficult and images are sought in order to help with understanding. Words such as helping, winning, caregiver, discriminating, equality, care home advisory board, self-determination, polling station, pain, danger etc. denote abstract contexts for which text authors hope to find suitable pictures in data bases – predictably without success. As many manifestations

as there are, for example, of discrimination or love – there are just as many equally individual expressive images. The number of required images, which data bases would need to provide for appropriate use, is extremely high. There is no guaranteed one-to-one match for abstract definitions. This is, as described in the section above, due to the nature of the image.

2.3 Image functions in the image-language-combination – a possible solution for abstract content

The difficulty in finding a meaningful picture consists solely in multiple encoding communication, i.e. the image-language-combination.

The major task in design is the question of how to transfer what the authors wanted to achieve with their design. Images can fulfil different functions.

> "Despite that fact that researchers distinguish individual functions of images, it should be kept in mind that a single image is usually capable of fulfilling different functions at the same time; that functions show significant overlaps and that one image, depending on learners, situation, task etc., can fulfil multiple functions. Accordingly, the functions of images can be grouped into two broad categories, namely affective-motivational functions and cognitive functions." (Peeck 1994: 60; English translation of the German original)

Peeck further divides cognitive functions into representative, interpretative and organising functions.

It is not possible to specify the field of application for accessible graphic design. It is rather applicable to any type of information. This is why both affective-motivational functions and cognitive functions can be found in images with text-image integration. Weidenmann formulates a model with three different images functions for informative and instructing multimedia offerings that mostly coincides with the statements of Peeck. Weidenmann differentiates three image functions (Weidenmann 2002: 85 ff.), for which he also develops design notes. This is what makes Weidenmann's research especially relevant for accessible graphic design.

- **Representation function** – illustrates familiar and unfamiliar objects, a schema is created
- **Organisation function** – context knowledge extends a schema or a script, prior knowledge is activated, an existing schema or script is extended
- **Interpretation function** – relations and contexts between known elements/schemas are illustrated, a new script is built based on the known schemas

In 2016, Epp und Speransky conducted a study on the quality of images in German Easy Language. They explored the following question: Do the image functions as formulated by Weidenmann have differing degrees of suitability for transferring abstract terms into images in German Easy Language? Based on this question, the following hypothesis was proposed: Users of Easy Language prefer images that primarily fulfil the organisation function. The study is built on the specifically created research objects, which consist of both images and texts. The abstract topics "danger", "winning" and "pain" are examined.

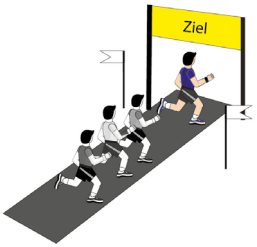
There is only one informative (expository) text for every topic. Every research object consists of three image-language-combinations with the same text. The image was drawn in three versions in order to fulfil the three image functions, namely the representation function, the organisation function and the interpretation function (see fig. 5, 6, 7).

The images were developed in accordance with Weidenmann's recommendations (see Weidenmann 2002: 88 ff.). In general, he recommends applying presentation codes (local colours, shades, perspective etc.) and control codes (arrows, frames, signal colours etc.). The clarity of the transferred content is decisive for the transfer of information. This is why the explicitness and reduction of details became crucial in the creation of texts and images. Content-wise, simple information that is not concrete, but abstract, was implemented.

Each test person was presented with all three functions individually, and collectively at the end, so that s/he could express any preferences. Multiple answers were also possible.

The results for the topic "winning" are briefly shown here.

The concept chosen for implementation was a race that takes place in a tournament. This concept was applied for all three images to ensure comparability.



I participate in a running competition.

I am the fastest runner.

I win the competition.

Figure 5: Winning – representation function (Source: Study ©Epp/Speransky, Merseburg University 2016)

The first visual medium fulfils the representation function. Familiar schemas, such as people in running gear, a running track, the order of people, the posture of people, the finishing flag etc. are shown. As a signal colour, the finishing line and the gear of the leading runner were highlighted. Regarding local colours, the skin and hair of the leading runner were dyed.

I participate in a running competition.

I am the fastest runner.

I win the competition.

Figure 6: Winning – organisation function (Source: Study ©Epp/Speransky, Merseburg University 2016)

The second image was implemented using the organisation function. The situation is strongly emotionalised because the winner's moment of triumph is

obvious in the illustration. The facial expression and body posture help to recognise the joy of winning the race. Regarding signal colours, the finishing tape was highlighted. A control code was additionally applied in this image, namely, the digit "1" is on the runner's shirt. Its purpose is to highlight that this is the first person to reach the finishing line, i.e. the winner.

I participate in a running competition.

I am the fastest runner.

I win the competition.

Figure 7: Winning – interpretation function (Source: Study ©Epp/Speransky, Merseburg University 2016)

The third image fulfils the interpretation function. This situation is similar to the representation function of this topic, though more details were added. In this way, you can extend an existing schema or create a new one. Among the added details are the grandstand with the spectators and the scoreboard. The finishing line and gear of the leading runner were highlighted in signal colours again. The skin and hair of the leading runner are also highlighted in the local colours.

A total of 18 persons participated in the study. They could assign three preferences each (54 preferences). The preferences could be divided both into thirds or halves and distributed across several images. This is why there are uneven results. (sum: 53.9).

- Winning, 2a, representation function: 1.8 preferences
- Winning, 2b, organisation function: 13.3 preferences
- Winning, 2c, interpretation function: 2.8 preferences

- Danger, winning, pain, representation function: 6.8 preferences
- Danger, winning, pain, organisation function: 27.3 preferences
- Danger, winning, pain, interpretation function: 19.8 preferences

Epp and Speransky (2016) were able to proportionally verify their hypothesis, according to which individuals with learning difficulties in terms of image-language relations prefer images with a situational image function because the organisation function was the most preferred in the two topics "winning" and "pain". Only in the case of "danger" did the visual medium that fulfils the interpretation function rate the best.

The study has shown that the design of visual media based on Weidenmann's image functions provides a useful approach for the visualisation of abstractions in accessible graphic design. Furthermore, the study has also shown that the organisation function is very well suited to situationally placing the target group of German Easy Language in a context. For the teaching-learning context, for which these image functions are primarily intended (see Weidenmann 2002: 84), the interpretation function, which was preferred by the test persons for one topic, is also suitable. The representation function has proven to be rather unsuitable. According to the assessment of the research group, the design of visual media in German Easy Language can and should be based on Weidenmann's rules in the future.

The study by Epp and Speransky (2016) suggests that it is appropriate to use images with a situational image function in order to clarify any abstractions. The deliberate inclusion of situational images in text production thus has a beneficial effect. The implemented strategies are the subject of current research at Merseburg University.

Moreover, Epp and Speransky (2016) were able to prove that the test persons were able to deal with Weidenmann's recommendations on the use of display codes and control codes. Meanings could often be assigned by using colour (red fire, yellow finishing tape, red blood). In contrast, they had difficulties evaluating the colour accentuation of the winning runner against the black-and-white illustration of their competitors in the representation function and the interpretation function.

The study on the topography of documents by Lange, Römer and Schneider (2017) also reported on problems that people with learning difficulties have when identifying colours as a structuring element. The reduction of didactical colour elements in accordance with similarity is a possible solution.

In both the study by Epp and Speransky (2016) and that by Lange, Römer and Schneider (2017) the participants were encouraged to voice their feelings and thoughts during the tests. The so called "thinking aloud" method helped to collect the information and analyse the test results. Epp and Speransky (2016) reported on the strong effect that emotional image contents, such as faces showing fear or pain, have on the participants. These emotional image contents have often evoked solution strategies and thus activated them in the viewers. This confirms the positive effect of images.

The master's thesis of Cordula Wünsche (2015) proves that written instructions in complementary image-language-combinations are performed faster and with fewer errors than a redundant image-language-combination. This confirms the statements by Bredel and Maaß (2016: 273) for matching of images. Moreover, Wünsche (2015) reports on attentive examination of images that served as feedback on the action.

3 Summary

Accessible graphic design constitutes a complex design performance consisting of typographic knowledge, understanding of layout and visual knowledge, which, in turn, is contingent on having a talent for design. But knowledge about language design is also beneficial. Images with image functions, which are particularly appealing to readers, can be designed as long as text and images are considered a complete informational unit. It turned out that motifs with a situational image function are understood best. The complementary illustration of abstract context has priority over redundant illustration of concrete objects. Images which can be easily extracted from the image database may fulfil an affective/motivational function but do not help to convey information. Furthermore, the readers encounter data base images in different contexts. Whether this confuses readers or not remains unclear.

All of the illustrations for the average population, whether for children or adults, are drawn individually. The individual illustration also makes sense for accessible graphic design and is a component of inclusion.

Accessible graphic design is based on the needs of the target group "people with learning difficulties". People with learning disabilities, older people and migrants are very different target groups. From the perspective of graphic design, information products in German Easy Language are neither suitable for older people nor for migrants because both target groups can easily understand, for example, abstractions and are familiar with effective typographic structuring elements for text organisation.

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Ursula Christmann and Norbert Groeben

Comprehensibility: the psychological perspective

1 Psychological comprehensibility research: historical developments

Psychological research into text comprehensibility began with classic readability research, which was already established as a separate research field in the Anglo-American area of the 1930s (classical work: Gray/Leary 1935). The main purpose of this research was to determine and optimise the readability of text materials. To this end, a large number of objectively countable linguistic-stylistic text characteristics was determined (e.g., word length, word difficulty, sentence length, sentence complexity) as well as their influence on the readability of a text (reading speed, expert opinion, comprehension tests etc.) (see Groeben 1982). The most significant of these characteristics were then transformed into readability formulas by means of regression analyses. In doing so, text characteristics were correlated with readability results and a function was mathematically calculated that enables predictions regarding the readability/comprehensibility of the respective texts. Over the years, a number of such readability formulas have been developed that are individually characterised by a different weighting of word, sentence and syllable factors. The best-known formula is Flesch's reading ease formula (1948) which takes into account the number of syllables per 100 words and the average number of words per sentence (sentence length) (adaptation for German-language texts: Amstad 1978). Using computer-based aids (Software TextLab), the so-called Hohenheim Comprehensibility Index (Hohenheimer Verständlichkeitsindex) (Klartext-Initiative of the University of Hohenheim) calculates readability with four readability formulas validated for the German language and offers a more current and complex formula.

The factor-analytical processing of the text characteristics differentiated in this tradition relatively consistently shows that the factors of word and sentence difficulty have a special significance for the readability of a text (Klare 1963; Groeben 1982). Accordingly, the use of short, common words and sentences with a simple grammatical structure is considered to improve comprehensibility. However, it became clear early on that readability research can only rudimentarily measure the comprehensibility of a text because it refers exclusively to formal features of the text surface and ignores content-structural aspects of texts as well as readers' comprehension processes and their individual conditions for understanding. It is therefore hardly surprising that the classic readability formulas can only predict reading speed, but not the comprehension and retention of the text content (Groeben 1982). By contrast, the most recent computer-aided method for assessing comprehensibility – Coh-Metrix (e.g. McNamara et al. 2010) – takes into account not only many syntactic but also semantic cohesion features derived from previous research at a local and global level that have an influence on ease of reading. However, so far empirical validations are lacking.

2 Text-reader-interaction as a theoretical basis for comprehensibility research

These limitations of readability research led to the development of psychological comprehensibility research as early as at the beginning of the 1970s. The movement was characterised by the attempt to analyse textual characteristics that promote understanding not only in formal-stylistic terms, but also in relation to recipients' comprehension processes. There are two research approaches that have developed largely in parallel: a theoretical-deductive approach (Groeben, 1972; 1978) and an empirical-inductive approach (Langer et al., 1974). Despite the differences in procedures, the two research approaches achieve four relatively consistent global dimensions of text comprehensibility: (1) linguistic simplicity; (2) semantic redundancy; (3) structure-order; (4) motivational stimulation. These four dimensions are even today still regarded as the most significant dimensions of text comprehensibility. They are, in principle, con-

sidered to be incomplete and can be specified and broadened with further features in the course of research developments. Since the beginning of the 1980s, such a differentiation has primarily taken place based on more recent linguistic and cognitive-psychological text processing research (overviews: Christmann 1989; Christmann/Groeben 1996; Christmann 2015). This research focuses on the question of how recipients integrate word and sentence sequences in the comprehension process and build them into a coherent representation of text meaning. In this context, a wealth of further characteristics was identified that support the integration process by giving readers hints on how sentences and parts of the text are to be related to each other, in addition to the text characteristics already discussed in classic comprehensibility research. In doing so, characteristics of recipients such as prior knowledge, intelligence, interest etc. are also taken into account. This strand of research represents the provisionally last stage of development in psychological comprehensibility research, which is, however, also considered to be unfinished.

The theoretically shared basis for all developmental stages of psychological comprehensibility research consists of the insight that understanding a text is not a passive process of extracting meaning from texts, but an active process of *constructing* meaning, in which the reader connects the text contents with previous knowledge according to his or her expectations and interests. From this so-called cognitive constructivism of the language-processing subject (according to Bartlett 1932), it results that the reading process always takes place as an interplay or an interaction between the characteristics of the text and the cognitive structure of the recipient (text-reader interaction; e.g. Groeben 1982). The comprehension process as such is modelled as the interaction between ascending, text-based processing and descending, expectation-based processing. Text-based processing is influenced by the characteristics of the text (syntax, semantics; structure etc.), expectation-based processing by the characteristics of the recipients, their expectations, objectives, interests and previous knowledge. The quality of understanding therefore depends on the characteristics of the text, but also on the cognitive, emotional and motivational preconditions of the reader. Psychological comprehensibility research concentrates on the text side of this interaction process by asking and empirically testing which text characteristics promote or impede understanding.

3 The empirical-inductive and the theoretical-deductive approach in comprehensibility research

Two different paths have been taken to determine text characteristics that improve comprehensibility: an empirical-inductive path and a theoretical-deductive path.

The empirical-inductive approach was based on 18 concrete characteristic descriptions of texts (e.g. coherent vs. incoherent; stimulating vs. long-winded; fluent vs. clumsy), which had proven to be relevant in previous research. On this basis, impression differentials were formed, with the help of which experts evaluated texts of varying difficulty and content (functional texts, administrative texts, academic texts). The factor-analytical processing of these evaluations led to a pooling of the original 18 characteristics into four dimensions of comprehensibility (Langer et al. 1974: 13 et seq.):

(1) Linguistic simplicity (simple presentation, short sentences, common words, explanation of technical terms, concrete, descriptive);
(2) Structure-order (structured, coherent, clear, differentiation between the essential and the unessential, red thread recognisable, chronological);
(3) Brevity-conciseness (too short, limited to the essentials, crowded, focused on the learning goal, brief, each word is important);
(4) Additional stimulation (stimulating, interesting, varied, personal).

The learning success could be validly predicted on the basis of the comprehensibility values: Texts with improved comprehensibility were remembered and understood significantly better than the original versions of the same texts (Langer et al. 1974; in summary: Groeben 1982; Groeben/Christmann 1989). However, the experimental design did not permit an empirical assessment of how important the individual dimensions are for successful learning. The authors rate "linguistic simplicity" and "cognitive structure and order" as more important than "brevity and conciseness" and "additional stimulation" accord-

ing to subjective impressions. Although the approach known as the Hamburg Model has often been criticised because it is based only on expert judgements to determine comprehensibility and because the individual text characteristics are inadequately described (Groeben 1982), it does however allow an extremely economic assessment of comprehensibility and is still used today in research and practice. Friedrich (2017) offers a continuation of this approach of subjective comprehensibility assessment by distinguishing 10 scales for the measurement of comprehensibility, which were then validated with comprehension data (multiple choice tasks). In overlaps with the Hamburg model, four scales proved to be particularly important:

- Word difficulty
- Sentence difficulty
- Conceptual clarity
- Re-organisation effort

The theoretical-deductive approach (Groeben 1972) is based on models of psycholinguistics (theories of sentence design/stylistics), psychology of learning (cognitive learning theory) and motivation (theory of curiosity). On this basis, Groeben established dimensions of comprehensibility and derived characteristics of text comprehensibility from them. He distinguishes four dimensions of text comprehensibility:

(1) Stylistic simplicity (short phrases, active verbs, active-positive wordings, personal words, no nominalisations, no embedded subordinate clauses);
(2) Semantic redundancy (no literal repetition, no long-windedness);
(3) Cognitive structure and order (use of advance organizers, highlighting of important concepts, clarification of differences and similarities; use of examples; summaries; sequential text structure);
(4) Conceptual conflict (novelty and surprise, insertion of incongruous concepts, alternative problem solutions, questions).

The empirical verification was carried out with 18 experimental texts, which were identical in content, but differed in the expression of the dimensions (Groeben 1978: 87 et seq.) Dependent variables were comprehensibility, retention and interest. The factor cognitive structure and order proved to be the most important factor for both comprehensibility and retention. The best learning results were achieved when using a hybrid form of the two dimensions "cognitive structure" and "conceptual conflict". The dimension of "stylistic simplicity" was also significant, but only for the comprehensibility rating, not for text retention. The factor "semantic redundancy" was significant for comprehensibility only in combination with medium linguistic simplicity (Groeben 1978: 102 et seq.). It should also be emphasised that there is a curvilinear relationship between comprehensibility/interest and retention, i.e. that medium and not maximum comprehensibility is optimal for learning success – a consequence that is particularly important for the production of learning material.

A comparison of the two approaches reveals similarities with regard to the theoretical significance of the dimension cognitive structure/order, which is considered by both to be the most important for the realisation of comprehensible texts. There are nonetheless differences though, especially in the dimension of linguistic simplicity, which, however, was probably overestimated in the inductive approach due to the focus on classic stylistic approaches, whereas this dimension may not have been optimally realised and thus ultimately underestimated in the deductive approach (see the detailed considerations in Groeben: 1982). Even if the text features subsumed under the dimensions are not yet fully or precisely explained in either approach, the four dimensions can still be regarded as a directive for producing optimal comprehensibility. The subsequent research stages of cognitive text processing psychology, which are included in the following discussion, offer more precise and comprehensive explications of characteristics.

4 Concrete characteristics of the comprehensibility dimensions

4.1 Linguistic simplicity

The dimension of linguistic simplicity encompasses all the characteristics of the text surface. Empirical studies exist, in particular on aspects of word choice and grammatical and stylistic sentence design.

At the word level, word difficulty has been examined in particular. According to this, frequent and (subjectively) common words are processed faster than rare words; texts in which less common words are replaced by common words lead to improved comprehension performance (overview in Groeben 1982). Similarly, recent studies show that the density of technical terms in popular scientific texts (corpus with 465 texts) leads to slower reading when these are subjectively perceived as difficult to understand (Wolfer/Held/Hansen-Schirra 2015). Overall, however, the consistent use of common words is only recommended to a limited extent for motivational reasons, as this can otherwise lead to boring texts. From a didactic perspective, there is also the danger that no new words will be learned (Christmann/Groeben 1999).

The effect of abstract words in comparison to concrete words has been studied especially intensively, since concrete words are easier to remember than abstract ones (Marschark/Paivio 1977). The effect is explained in the context of dual coding theory, according to which concrete words are coded both verbally and visually (Sadoski/Paivio 2001). A concreteness effect in the sense of facilitating processing (e.g. better retention, more precise conclusions) could be demonstrated not only for words (e.g. Wippich 1987), but also for texts of different lengths (Sadoski/Goetz/Rodriguez 2000). As a practical consequence, it can be deduced that a concrete context of interpretation should be provided when conveying abstract information (empirical: Beishuizen et al. 2002). It should also be taken into account that clarity can be created not only through concrete words, but also through images and graphics. The positive influence of images on illustrated text information could be meta-analytically confirmed and is also explained in the context of dual coding theory (overview: Peeck 1993).

In addition to word difficulty, the influence of sentence difficulty (in the context of Chomsky's examination of Generative Grammar) on comprehensibility has also been empirically proven. It was shown that embedded relative clauses, nominalisations, overly long sentences with several clauses, sentences with a great wealth of information (overview in Groeben 1982) as well as syntactically ambiguous sentences (summary in Christmann/Groeben 1999) have a clearly negative effect on comprehensibility (on the specific influence of nominalisations and their dissolution on reading time of legal texts see Wolfer 2016).

When compiling and implementing such characteristics, it is usually implicitly assumed that readers analyse the syntactic input as completely and correctly as possible. However, it does not have to be that way. It is quite possible that, in natural reading situations, syntactic analysis follows a "good-enough principle" (Ferreira/Bailey/Ferraro 2002) in which readers rely on simple heuristics and do not perform a complete analysis of the syntax. Semantics are more important for the capturing of sentence meaning according to this approach. When decoding the meaning of a sentence, the syntax merely has a kind of auxiliary function, which only comes into effect in the case of complex or ambiguous sentences (Christmann 2006; discussion on the influence of syntax in Poulson/Gravgaard 2016).

In summary, it can be said that the characteristics of linguistic-stylistic simplicity and concreteness are important for an easy and smooth processing of the text surface. They influence the literal rather than the meaning-oriented understanding, but through easy and effortless reception, cognitive resources become available for the development of semantic sense structures, which are at the centre of the process of understanding (Christmann/Groeben 1996: 149 et seq.).

4.2 Semantic redundancy

The characteristic of semantic redundancy (long-windedness) refers to the difficulty or ease of processing depending on the circumscribing repetition of text statements. As with linguistic simplicity, the design of the text surface is also important here. This raises the question of whether increasing or reducing semantic redundancy facilitates processing. On the whole, relatively few studies

have been carried out on this dimension, which predominantly point to the fact that a compression of the text information leads neither to an improvement nor to a deterioration in comprehensibility (see for the case of newspaper texts: Bassin/Martin 1976), but that an increase in redundancy (to a certain degree) tends to promote processing (for a summary: Groeben/Christmann 1989). In a study by Reder, Charney and Morgan (1986), an elaborate manual for operating a computer system compared to a less elaborated one led to time savings in the performance of tasks and to fewer incorrect commands.

Basically, it can be assumed that the enrichment of a text by repetition of important terms, explanations and elucidations should increase comprehensibility. The effectiveness, however, depends on the type of text (academic texts, functional texts, instructions, administrative texts, etc.) and the prior knowledge of the reader. In principle, the level of detail must not be so high that the readers lose the superordinate reference points.

4.3 Structure/Order

The dimension structure/order refers to the structure and organisation of a text's content as well as to the readers' prior knowledge. This interplay between a text's content structure and recipients' cognitive structure was first modelled in the early 1960s in the context of the cognitive learning theory according to Ausubel (1963). Since the 1970s, it has been continuously further differentiated in text processing research in cognitive psychology.

4.3.1 Cognitive learning theory

Cognitive learning theory defines the reception process as the procedure of integrating new material into the learner's cognitive structure. Researchers in this field explicate and empirically investigate measures for improving text learning. These include, in particular, advance organizers, sequential arrangement of textual content, integrative unification and consolidation (summarised in: Christmann/Groeben: 1996).

Advance organizers are short prepended introductions to a text that establish the relevant textual concepts at a level of abstraction that is more comprehensive than within the actual text itself. They constitute anchoring concepts intended to facilitate integration of subsequent textual information. While the

empirical findings have long been inconsistent with regard to the question of processing advantage, recent studies have now clarified that such advance organizers are particularly effective when they are structured according to the thematic structure of the text (Mannes/Kintsch 1987) and contain concrete concepts and analogies in addition to highly inclusive, i.e. superordinate ones (Corkill/Bruning/Glover 1987). Sequential arranging refers to the sequence of textual information. A hierarchical-sequential text structure, for example, has proved successful, in which the text information is first described at a high level of abstraction before gradually moving on to more detailed and concrete levels of presentation (Christmann 1989). In later research, sequencing according to superstructures (conventionalised content organisation for different text types such as scientific, legal, narrative, etc. texts) has proven to be efficient for retention, answering questions about the text and processing the text information (overview: Christmann 2008). Integrative unification refers to the indications of similarities and differences between already established and new concepts. This can be done, for example, by enriching texts with elaborations, examples and analogies. Elaborations and examples are considered to facilitate processing because they serve to build up a rich knowledge structure, and analogies promote comprehension because they illustrate correspondences in content or structure between what is known and what is new (overview of empirical findings: Christmann/Groeben 1999). Finally, a consolidation of the acquired knowledge can be achieved through summaries, highlighting and underlining. While older studies could only show isolated advantages for processing, more recent cognitive psychological studies in the context of so-called signalling (see below) show that such cues on the surface of the text promote the development of a coherent text structure, which has a positive effect on retention, inference generation and reading comprehension as central components of the total comprehension process (e.g. Lorch, 1989; Lorch/Lorch 1996).

4.3.2 The cognitive psychology of text processing research

The construction of such a coherent mental representation of text meaning has been the focus of cognitive psychological research on text comprehension from the beginning (overview: Christmann 2008). Comprehension here means relating sequences of words and sentences to each other and placing them in

a meaningful context. This integration process can be supported on the text side by a coherent organisation of content, which gives readers cues as to how sentences and parts of the text are to be related to each other. If such structuring cues are missing or difficult to recognise for the recipient(s), coherence gaps arise which have to be closed by inferences and restructuring. Empirical evidence has repeatedly shown that the search for suitable reference points is time-consuming and makes processing more difficult (overview: Christmann/Groeben 1996). In research, a distinction is made here between cues for establishing local vs. global coherence.

Local coherence refers to the links within and between individual sentences. In the simplest case, the relations between parts of sentences and sentences can be established by referring to the same referent (coreference). On the language surface, this can be realised by word repetitions, pronominal resumptions, resumption of sentence sequences by proforms, back-references and pre-references, but also by contiguity relations with which reference is made to temporally, locationally or structurally connected events, situations, actions (cf. Dressler 1972). The importance of such explicit references for the effortless and rapid linking of sentences has been proven in many empirical studies (overview: van Dijk/Kintsch 1983). Furthermore, comprehension is generally facilitated if both the maintenance of a topic and its change are marked linguistically (cf. Schnotz 1993). In addition to coreference, links between sentence parts and sentences are also established by so-called coherence relations. These are relations that involve a cause-effect relationship, an addition, a linking of conditions with consequences, problems with solutions etc. (taxonomy in Sanders/Spooren/Noordman 1992) and which can be marked on the language surface e.g. by the use of (causal, temporal, adversative, additive etc.) connectives. Within the inconsistent findings in this respect (overview: Degand/Sanders 2002), the following tendencies can be identified (cf. Christmann 2008): The insertion of coreferential and causal relations leads to smoother and faster text reception and better retention compared to texts without these relations (e.g. Loxterman/Beck/McKeown 1994), especially when the reader(s) have no explicit prior knowledge in a content area. In the case of connectives, explicit causal links ('because', 'therefore', 'thus') between sentences have proved to be

particularly effective in processing. Compared to adversative, additive and missing links, they lead to faster reading and better retention of text information (e.g. Millis/Magliano 1999). Processually, the effect is due to the fact that the respective antecedent sentences remain in the working memory for longer and are available as an integration instance for subsequent sentences (Millis/Just 1994). In addition, causal links cause faster and more efficient inference formation (Millis/Golding/Barker 1995), for shorter and longer, expository and narrative texts (Singer/O' Connell 2003). Furthermore, they have a positive effect (for informational texts) on the quality of comprehension (empirical: Degand/Lefèvre/Bestgen 1999; Degand/Sanders 2002). However, these studies have also made it clear that connectives only have a positive effect on the quality of the reading process if the causal relations between the sentences are not transparent anyway or can be easily inferred (cf. Linderholm et al. 2000).

Global coherence refers to links between the sub-topics and sections of a text. Accordingly, the aim is to support the development of a global structure of text meaning and the tracking of focus in the readers by means of special cues in the text. In particular, rhetorical relations and signals are available. Rhetorical relations are semantic relations with which the sub-topics of a text are linked on a global level. The relations distinguished by Meyer (2003) have become known in particular: Problem/problem solution, cause/consequence or effect/impact, comparison (in the sense of indicating similarities and differences between textual objects), grouping and description. These implicit structural features can be indicated on the surface of the language by certain signal words (e.g. 'because', 'therefore', 'leads to', 'consequence of' etc. to clarify the relation 'causation') and thus give the reader clues about the underlying thematic structure. Positive effects could be observed in particular with regard to retention and depth of processing (overview: Meyer 2003). However, the relations distinguished by Meyer are not suitable for describing the content/thematic structure of every text type/structure. Rather, the functional connections and implicit structural features must be worked out for specific text types and made explicit on the surface of the text. In contrast to the more implicit rhetorical relations, signals are indications on the surface of the language that highlight the central themes of a text and their interrelationships without adding further semantic

content. Signals include titles, chapter headings and subheadings, the repetition of aspects of content (summary statements, repetition of emphasis statements), chapter overviews and introductions, function indicators (cue words such as 'thus' and cue phrases such as 'to summarise. …'), relevance indicators (e.g. 'To be emphasised is…'), numerical enumerations (e.g. of central thoughts and arguments), typographical references (e.g. underlining, italics etc.) (cf. Lorch 1989), but also short summaries distributed throughout the text (van der Meij/van der Meij 2012).

According to the very extensive research on the effect of signals, they contribute to the readers' representation of a text as a hierarchically organised thematic structure, whereas a text without signals is depicted as an unconnected list of individual topics. And only the hierarchical structure, not the disconnected list, is an effective retrieval aid in text reproduction (Sanchez et al. 2001). The facilitating effect of signals on processing has been empirically proven for various components of the comprehension process (attention, reading speed, reading comprehension, inference generation, selective information search and reproduction) (for a differentiated overview of empirical findings on the effect of various types of signals, see Lorch 1989; Gaddy/van den Broek/Sung 2001; Lorch/Lemarié/Grant 2011). It is relatively well established that signals favour the retention of the highlighted information and lead to better structured recall protocols (e.g. Loman/Mayer 1983; Lorch/Lorch 1996; Sanchez et al. 2001). With regard to overall retention, positive effects of signals can be demonstrated especially when the text contains interwoven topics and is sufficiently complex (Lorch/Lorch 1996; Sanchez et al. 2001). In general, readers with little prior knowledge benefit considerably from a text structure improved by signals (Xianyou 2004), both in terms of literal and inferential comprehension (McNamara/Kintsch 1996; Voss/Silfies 1996; Schmitz/Gräsel/Rothstein 2017). This is also evident in multimedia texts where text-image integration is supported by signals (meta-analysis by Eitel et al. 2013). An occasionally observed reversal effect, according to which readers with high prior knowledge perform better with incoherent texts than with coherent ones, does not seem to be stable (Kamalski et al. 2008; detailed discussion in Schmitz 2016). By contrast, in recent studies with more than 700 students, the comprehension-enhancing effect of global coherence aids in texts ("transparent reference structure, the-

matic subheadings, emphasis on higher-level knowledge units, explication of functional relations"; Schmitz 2016: 138; English translation of the German original) was also found to be independent of prior knowledge, the ability to extract meaning from texts and thematic interest (Schmitz 2016: 189 et. seq.). Another relevant variable that moderates the influence of global text cohesion on comprehension is readers' knowledge of text structures and the meaning of rhetorical relations, which is a relevant moderator variable for the comprehension-promoting effect of these features (Sánchez/García/Bustos 2017).

Overall, it has been impressively demonstrated time and again in the context of recent text processing research that texts are better understood the clearer and more explicit the indications are as to how the textual information is to be related to each other. For this reason, the characteristic of global text coherence may be considered the most important feature of comprehensible non-fiction texts today (Schmitz 2016).

4.3.3 Motivational stimulation

The question of the influence of a motivating text design on reading comprehension has been dealt with within the framework of two different theoretical approaches (summarized: Christmann/Groeben 1999): the curiosity motivation theory (Berlyne 1960) and the more recent interest research (Krapp/Prenzel 1992).

According to the curiosity motivation theory, curiosity about knowledge arises from cognitive conflicts triggered by specific features of an object (so-called collative variables), namely novelty, surprisingness, uncertainty and incongruity. The theory postulates that such characteristics lead to doubt, perplexity and confusion among the reader(s) and thus stimulate the search for new information. In the terminology of Loewenstein's (1994) reformulated curiosity theory, an information gap is created in the cognitive structure that triggers a need to search for information (overview: Christmann 2004: 75 et. seq.). In this process, the following characteristics can be used to create conflicts:

(1) conflict-evoking questions;
(2) introduction of new and surprising content in question form;
(3) incongruent retreat to the known (insertion of information that contradicts the recipient's knowledge and belief system);
(4) alternative solutions to problems by pointing out problem alternatives that are as equally probable as possible (for more detail: Groeben 1982: 267 et. seq.; Groeben/Christmann 1989).

However, the insertion of such potentially interest-triggering text features must not disturb the superordinate structure of the text contents. Therefore, according to classical comprehensibility research, a presentation of text content that evokes conflict only has a positive effect on processing if it is ensured that the construction of a cognitive framework is not hindered by it (Groeben 1982).

The direction of these findings is also confirmed by interest research (cf. Krapp/Prenzel 1992; Sadoski 2001). However, in this approach, no interest-triggering text features are identified, but the interestingness of text elements is assessed by raters. A retention-promoting effect can be demonstrated with this method, for example, if important text elements are also presented in an interesting form (e.g. Wade/Adams 1990). The most important finding in the present context is that simply enriching texts with interesting but unimportant details does not improve comprehension and even has a negative effect on overall retention and problem solving (Harp/Mayer 1998). It is assumed that such details hinder comprehension and retention of structurally important information because they activate knowledge schemata that conflict with the construction of an adequate cognitive framework ('seductive detail effect'; empirical: Garner et al. 1991).

All in all, it can be concluded from the present findings that motivational text design should be used sparingly and should under no circumstances hinder the processing of structurally important information. Under this premise, it does not have a direct effect on the comprehension and retention of a text, but it can contribute to the recipient's attention remaining constantly high and the text reception not being prematurely interrupted (see also Ainley/Hidi/Berndorff 2002).

5 Limits of comprehensible text design

Although the outlined text features that promote comprehension are empirically well established, comprehensibility research aimed at optimising texts always comes up against a structural limit: there is no uniform optimum of comprehensibility for all readers.

This is shown, for example, by the fact that in the majority of studies an effect of comprehensibility-enhancing text design is demonstrable above all with low prior knowledge, low to medium ability levels and unfamiliar text content. In the case of familiar content and a high level of prior knowledge, on the other hand, it can be assumed that recipients can compensate for deficiencies in the design by drawing on their prior knowledge. Empirical evidence has even shown that a text that is completely coherent and well-structured in terms of content leads to qualitatively poorer comprehension performance for recipients with a high level of prior knowledge, while it facilitates comprehension for recipients with little prior knowledge (Kintsch 1998: 307 et. seq.). Presumably, highly coherent texts no longer offer readers with a high level of prior knowledge an incentive to actively engage with the text information. For such readers, texts may also contain gaps in coherence, which are to be closed by reader-side inferences and elaborations (Groeben 1972/1978; Christmann/Groeben 2002: 156). This is in accordance with the framework conception of text comprehension as text-reader interaction explained at the beginning. If the interaction between the individual cognitive structure of the recipient(s) and the text is decisive for the construction of text meaning, then different meaning structures result depending on individual cognitive prerequisites, prior knowledge, expectations, interests and objectives as well as reception strategies (Christmann/Groeben1999).

The practical consequence of these limitations is that the problem of optimising comprehensibility should not only be tackled in the text, but also with the reader. Readers must be enabled to process information texts from different areas effectively. And here, in the field of school learning, it has proven to be highly efficient over the last 20 years to provide students with knowledge about text structures and relations (e.g. cause-effect relations, problem and problem solving, etc.) so that they can build up text schemata that guide and

facilitate reception. A meta-analytical review of 45 studies on the effectiveness of instruction on text structures specifically distinguished by Meyer (e.g. 2003) demonstrated a positive effect of text structure learning on various measures of text comprehension in 85% of cases for students at different grade levels (Herbert/Bohaty/Nelson/Brown 2016).

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Benedikt Lutz

Comprehensibility from the point of view of expert communication

0 Introduction

Given the increasing complexity in all areas of our society, comprehensible expert communication is an important desideratum. Applied linguistics can, together with adjacent disciplines, contribute to improving this situation. First, I will describe the area under discussion (Section 1), then, I will introduce the interdisciplinary perspective (Section 2), after that, I will present an integrative concept of comprehensible expert communication (Section 3) and finally, I will outline two application examples (Section 4).

1 Comprehensibility and expert communication

In our modern knowledge society, everything is becoming more and more complex, both in professional environments as well as in private life. This complexity also manifests linguistically: consider, for example, the existence of different types of texts, such as insurance contracts, process descriptions in quality management, laws, terms and conditions, articles in professional journals, electronic patient records in hospitals, academic study material, application forms, PowerPoint presentations, mobile apps for your personal fitness programme etc. Comprehensibility therefore seems to be something of a concern for society as a whole, as is the general desire for a reduction of complexity.

But what is comprehensibility? – This term is used in everyday language and its meaning generally seems obvious to us. However, there is no clear definition of its uniform use and, depending on research traditions, interests and goals, different aspects have different priorities (Section 2; in detail Lutz 2015:

49–233). Research work conducted in the last decades has clearly shown that the concept of understanding does not operate on a *blank slate* of the human mind, but should be modelled in the paradigm of cognitive constructivism as an interaction of text characteristics and reader characteristics (Groeben 1982, Christmann/Groeben in this volume).We always understand based on what we already know. This applies to both cognitive aspects and emotional factors, formal knowledge of and familiarity with text types, as well as personal interests and situation-related factors. This means that when we talk about *the* comprehensibility of a text, it is always a generalising abstraction.

Methodologically, we can focus on *processes* in the analysis of how we understand (data collection during the act of communication, e.g. by using eye tracking or the think-aloud method) or on the *products* of understanding (assessment of retention of learned material, evaluation by experts, subsequent actions). By using suitable empirical methods, it is possible to indirectly draw generalising conclusions about the comprehensibility of texts; for an overview of the methods see Christmann (2004). These connections can be most seen in texts that directly guide the user (e.g. user manuals, unpacking instructions, help texts), where we immediately recognise successful understanding based on the subsequent actions; for a discussion of the validity of such methods see Lutz (2015: 118–125).

In comparison to established approaches in linguistics and cognitive sciences for the modelling of comprehensibility (e.g. Göpferich 2002), practically oriented approaches put a strong emphasis on plausibility, didactisation and simple implementation. In the German-speaking area, the Hamburg Comprehensibility Concept (Hamburger Verständlichkeitsmodell) (Langer et al. 1974) has been the most commonly used approach for optimisation of specialised texts in the last decades. It outlines the following approach: First, the available texts have to be assessed on to a five-point scale in terms of the four dimensions of comprehensibility (simplicity – classification/structure – brevity/conciseness – stimulating additions). After creating a target profile, the text is then reformulated according to the preferred characteristics. If a source text is evaluated as being poorly structured (but suitable with respect to linguistic simplicity), it is possible to focus in particular on a clearer structure in the reformulation.

The Hamburg Comprehensibility Concept (Hamburger Verständlichkeitsmodell) has been strongly criticised because of its high level of simplification and its lack of possibilities for the linguistic design of a text. However, it is very successful in the field of popular science, maybe even due to these characteristics. For a detailed analysis of the advantages and disadvantages see Lutz (2015: 83–102). A heuristic concept of comprehensibility is presented in Section 3, which attempts to unite the evident advantages of the Hamburg Comprehensibility Concept with current findings from different disciplines in order to generate a differentiating perspective.

The discussion of specialised texts and expert communication is based on the science of expert communication (Schubert 2007); Heidrich (2017) describes the historical developments of translation science and research on expert language, which have been gradually merged in the last few years. Translation studies are important in this context, because linguistic optimisation processes can be modelled as special monolingual cases of translating specialised texts. From the point of view of comprehensibility, text type linguistics and terminology play an important role in research on specialised communication.

Comprehensibility research traditionally focusses on written communication in an expert context. There is no causal reason to focus on written forms; it is probably connected to the degree of complexity as well as the amount of content and texts that need to be analysed and optimised. Without a transcription, this would hardly be possible. In some cases, e.g. intercultural ambiguity or hesitation and subsequent dialogue to clarify or resolve misunderstandings, discourse analytical methods for the analysis of spoken language are very helpful in order to obtain a better understanding of the communicative dynamics.

The term "expert context" by no means only refers to communication among experts of a specific domain. This would be referred to as expert-expert communication, which can be optimised through specific design of specialised languages. The particular challenge for communication in an expert context is the ability to be understood by people of other groups, even when close borders between fields are crossed. This can affect communication between experts of different fields, communication between experts and non-experts, as well as all intermediate stages and possible combinations. These intermediate stages are especially important: Consider, for example, the different linguistic and con-

ceptual approaches of people such as architects, construction workers, bricklayers, plumbers, labourers, craftsmen, building authorities or contractors. In this context we have to deal with different text types such as contracts, plans, instructions, meeting minutes or notices which have to be as comprehensible and clearly interpretable as possible, for all people involved.

In this context we should also discuss the demand for "general comprehensibility", which applies especially to laws and public authorities (authority-citizen communication) to enable the social participation of all population groups. This discussion is in parts very polemic (summarised in Eichhoff-Cyrus/Antos 2008) and not always solution-oriented. On the one hand, it would be naive to assume that it is possible to always achieve general comprehensibility everywhere and for everyone. On the other hand, we could achieve a remarkable improvement of legal and administrative language with concrete measures, e.g. by resorting to technical writers who have many years of experience in text optimisation (Lutz 2017b).

A call for "general comprehensibility" is also problematic from a theoretical and practical point of view. In the context of a functional-pragmatic and constructivist approach to text comprehensibility, *the perfectly comprehensible* text cannot exist at all in theory, but only optimised texts for different audiences or even individuals and for specific communicative situations, as everyone has different requirements for understanding. This also applies to the level of local linguistic structures. There are some linguistic structures that make text processing difficult in every case and for every audience (e.g. sentences that are too long and complex, or longer and unstructured texts) and should therefore be generally avoided. In these cases, the main factor is primarily the lack of *fluency*, i.e. unnecessary cognitive effort involved in reading (in detail Lutz 2015: 110 ff.). In other cases, we have to deal with benefit/loss relations, which have to be arranged ("optimised") differently depending on the situation. A popular example of this is the use of the passive voice, which is criticised in several style guidebooks for comprehensibility reasons. However, if we take a closer look, we can see that the passive voice offers numerous options for flexibly placing information in a sentence, e.g. omission of a non-relevant agent or emphasis of a meaningful verb in the end position. Furthermore, linguistic-economic considerations (e.g. keeping a logical object with active and

passive predicates) or the demand for clarification can be another reason why we use the passive voice (numerous examples in Göpferich 2002: 104 ff.). The same applies to the nominal style, which (in German) is an important medium of linguistic economy from a text-type specific point of view and helps to avoid complex syntactical structures.

That is why, in practice, we should consider the target audience and its linguistic competences, knowledge, expectations, emotions and the respective communication situation before every analysis. Only thereafter is it reasonable to focus on construction and optimisation of content and language, which does not always mean using a linguistically easy variety of German. In a programmatic article about Easy Language, Bock (2014) makes a distinction between Easy Language, Plain Language and citizen-oriented language, addressing the area of conflict between linguistic restriction and multifunctionality in connection with the concept of appropriateness. A strongly normatively-oriented and trailblazing concept of Easy Language, first presented in the Duden Leichte Sprache by Bredel/Maaß (2016), is, however, limited to a certain extent here; cf. the current anthology by Bock et al. (2017) on Easy Language, which offers different points of view on this topic.

If it is not possible to clearly define the target audience (e.g. "the general public"), it might be reasonable to agree on a specifically devised target level and target audience, whose needs must be met in the best possible way when producing a text. In a larger project to republish a law in Austria, for example, the notion of a target audience as "average citizens who are not educated in law but who have a university entrance qualification and do their best," (Lutz 2015: 311; English translation of the German original) was developed. Whether these goals can actually be accomplished could be monitored, where applicable, via empirical tests with appropriate samples.

2 The broad and interdisciplinary field of optimisation

In addition to genuine linguistic topics, we also want to suggest additional interdisciplinary and practice-appropriate approaches to comprehensible

communication, which might be less known to the readers. Due to spatial constraints, many aspects can only be touched on briefly.

The aspect of *applied stylistics* is discussed in style and writing guidebooks and sells a high number of copies in the consulting market in popular science. For this reason, this topic is deemed particularly relevant in Germany. Still popular style guides such as that by Reiners (1963) act on the assumption that literary stylistic ideals apply even to functional text types. From a contemporary point of view, this appears arbitrary and not very helpful. While the current books by Sick might be enjoyable to read (e.g. Sick 2004), the books by authors such as Wolf Schneider, which address (journalistic) professional audiences, are more suitable for the production of specialised texts as they offer precise and justified solutions (e.g. Schneider 1999).

In the broader field of *technical communication* several practical guidebooks exist that are also theoretically well-founded such as the book by Baumert (2003) on professional text production and the book by Ballstaedt (2012) on visualisation. The European Association for Technical Communication (Fachverband für Technische Kommunikation, TEKOM) needs to be mentioned in this context, as, in the last two decades, this association has contributed a great deal to the increase of professionalism of the job as a "technical writer" (there are about 100,000 technical writers in the German-speaking area). The association also publishes two book series that cover different topics from the field of comprehensibility.

In the narrower field of academic linguistics, the importance of text type linguistics and terminology studies in particular should be mentioned in the context of comprehensible expert communication. Text-type-specific conventions for design are adapted to dynamically altered communication needs. This can take place in an uncontrolled or in a supported manner, e.g. via document templates with defined structures and document examples. As a result, cognitive schemata are formed, which support both the process of text production and the expectations of the readers, and also facilitate the reception process. Based on this background, Bhatia (2004) discusses the *colonisation* and *hybridisation* of text types beyond corporate and industry borders in his analysis of the text type "meeting minutes".

Terminology work is a conceptual and practical task that is frequently neglected by business enterprises in their everyday work (Lutz 2015: 148 ff.). To exemplify this, we address the following questions: What characterises a good term, how do we define terms, how do we design *corporate wording* or a project-specific glossary, how do we handle abbreviations and how do we identify terms in printed and online documentation?

Research on *readability* (summarised in DuBay 2004) does not have a high standing in academic linguistics, as it makes statements about the comprehensibility of texts with very little theoretical foundation, based on fairly easy formal text characteristics (e.g. average length of words and sentences and word frequency). In most cases, this occurs by using so-called comprehensibility formulas, which are also often standardised for evaluation of the suitability of teaching material at certain levels of education. Such approaches seem to be suitable for a rough diagnostic evaluation of text complexity, similar to software metrics that are used for the pre-analysis of source code quality. They regained some importance in the last years thanks to the development of impressive software solutions that, based on high volumes of data, do not only calculate comprehensibility indexes but also offer support for terminology management, development of corporate languages and SEO (search engine optimisation) (for details see e.g. companies and tools like SDL, TextQuest, LinguLab or Searchmetrics). For German, the software TextLab (2018) deserves a special mention, as it unites several of these aspects. For an overview including the evaluation of its potential, see Lutz (2015: 71–83).

In the German-speaking area, the international *Plain Language movement* has been barely acknowledged so far. The representatives of this movement are organised in two associations and consider themselves as lobbyists for comprehensible language in legal and administrative texts, in the economy and in communication professions. Only a relatively small number of expert linguists is represented; they are a committed group of professional practitioners and consultants, who are especially active in the English-speaking countries and Scandinavia and promote practice-oriented solutions. Comprehensive information on activities, congresses and publications can be found on the websites of the associations (Plain 2018, Clarity 2018).

The topic of *multimodality and multimediality* is becoming increasingly important in expert communication. For the practice of text optimisation, it is also helpful to not only consider linguistics, but also to take a look at other specialised disciplines, such as information design: for decades, this discipline has been closely examining the design and impact of multimodal and multimedial forms of expression. In this regard, the International Institute for Information Design (IIID) (2018) and the *Information Design Journal*, published by Benjamins, should be mentioned. The *Knowledge Communication* approach, which originated in the tradition of communication science, is also strongly concerned with the effective interaction between text and image, especially in the field of management communication (Knowledge Communication: 2018).

Lastly, the practice-oriented discipline of *Usability Engineering*, which has become more and more established since the mid-1990s, should also be mentioned. It is concerned with the user friendly design of user interfaces. An example: If potential buyers do not complete their purchase in a webshop, the operators have to take action and find out why this has happened and how the design of the interface could be improved with the help of suitable means. The methods of *Usability Engineering* are also very useful for the optimisation of expert communication, as they are well-proven and can be applied with relatively little effort. Over the course of the last years, the broad term *User Experience (UX)* has prevailed. For an initial overview, you can refer to the extensive website of the Nielsen and Norman Group, which is probably the most well-known consulting firm in this field (NNg 2018).

However, this short overview of adjacent relevant disciplines and methods should not convey a notion of randomness. Quite the contrary: a detailed analysis and a structured methodical approach in the sense of reflected eclecticism seem to be particularly adequate in the case of an interdisciplinary approach. But it would be a shame to not consider relevant findings from adjacent disciplines just because they originated in a different research tradition. From the point of view of the philosophy of science, comprehensibility research could even be associated with a transdisciplinary approach: the respective individuals (such as experts in a specific field, authors or editors) should be involved in the process, in the sense of help for self-help. Using language language experts

alone to improve comprehensibility will not achieve sustainable success (for details see Lutz 2015: 33–47).

3 An integrative concept of comprehensibility

The main reason for the creation of this heuristic concept was to develop an auxiliary tool based on current findings that is also useful for authors who have not received any professional writing training. The goal is an increase in *language awareness,* meaning increased sensitivity for the creation of comprehensible texts. A considerably more detailed description than space here allows was provided in the author's habilitation thesis (Lutz 2015), which is accessible online in a slightly revised version (Lutz 2017a).

The *boundary conditions* of this concept – as displayed in Figure 1 as framing "clouds" – are intended to illustrate the overall context within which comprehensible texts are produced and received. They are partly predetermined by situational and institutional constellations, but can also be more or less flexibly created by the communication partners.

The *dimensions of comprehensibility* – shown here as ellipses within the cycle of text production, text analysis and text optimisation – are to be interpreted in a similar way to the Hamburg Comprehensibility Concept (Hamburger Verständlichkeitsmodell) and to Göpferich (2002), as more or less with regard to the expression of certain features of this dimension. The dimensions are not entirely independent of each other. Some should rather be maximised while others should be balanced according to the boundary conditions. The five-step expert rating for the as-is analysis and the target profile, which has proved itself in practice when applying the Hamburg Comprehensibility Concept (Hamburger Verständlichkeitsmodell), is definitely an option for the evaluation of the dimensions, but not necessary.

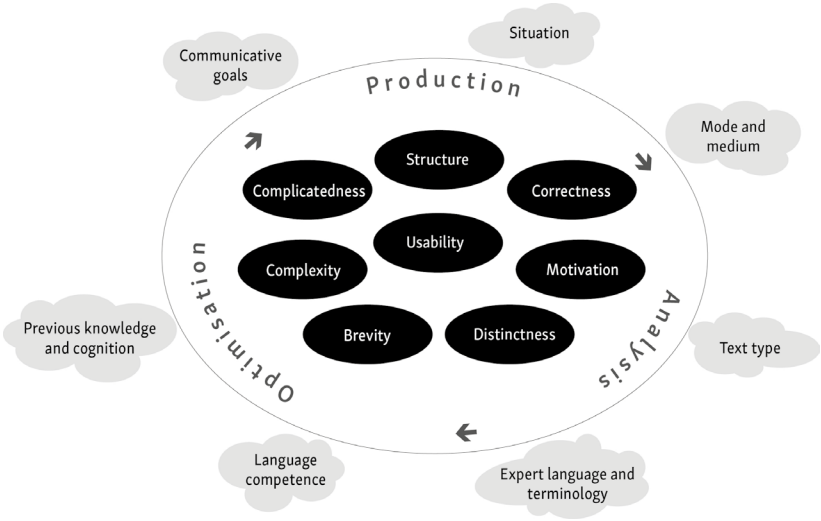

Figure 1: Boundary conditions and dimensions of text comprehensibility

The analysis, and if necessary, the adjustment of the *communicative goals* of authors and readers is an essential precondition for the target group oriented creation of texts. If the readers pursue other interests than those assumed by the author, preliminary clarifications are necessary, e.g. concerning the following questions: Is it a matter of competence to act (e.g. the operation of a new electronic device), of competence to decide (e.g. with regard to choosing alternatives) or simply of increasing knowledge (e.g. by reading a textbook)?

The specific *situation* within the process of writing or reading is often not taken into account sufficiently during the conceptualisation and creation of texts. One need only to think of the different situations while filling out a form at a local office, learning a board game in cheerful company or putting on snow chains during a snowstorm. The analysis of these factors can lead to the selection of different *modes and media* (verbal, visual, video; printed, on the screen, smartphone etc.). The different mode-medium combinations differ in their suitability for specific purposes. Therefore, from a communication perspective, short instruction videos ("how to…"), for example, are in most cases considerably more efficient than elaborately written textual or textual/illustrated manuals. Such videos are very successful, for example on platforms

like YouTube, and they are also beginning to gain ground in "serious" fields of technical communication. This became apparent in recent conference programmes of the TEKOM (German Association for Technical Communication), for example, or in recent degree programmes for technical writers.

The mastery of *specialised text types*, not only by producers, but also by recipients as well as their differentiation within the specific work environment is vital for communicative success. Previously learned patterns that support the process of writing and understanding form the basis upon which to evolve. The production process is typically supported by document templates, forms, adaptable sample solutions, textual or graphic elements or automatically generated text segments. To this end, it is essential to also achieve the right degree of *expertise of language and terminology.*

The *language competence* of the target group as well as their *cognitive skills and previous knowledge* are further boundary conditions that should be considered. Topics such as functional illiteracy (approximately 20% of the German population), English as an Esperanto of the globalised economy (English as a lingua franca), migrant communication and accessibility (easy languages) play a role here in addition to target groups' previous specialised education which always has to be taken into account.

As for the dimensions of comprehensibility, the differentiation between *complexity and complicatedness* is particularly important according to the author's experience, since those levels are often conflated in practice. Complexity refers to the level of content in this concept, complicatedness to the (text) design. Complexity should be *optimised* and complicatedness *minimised.* An example: If a law provides many exceptions to general legislation (e.g. transitional provisions, consideration of specific groups and cases of hardship, etc.), the law becomes complex in terms of content. This can be necessary as an expression of political compromise and decision-making processes. The sentences in laws, which are longer than average, did not arise from any sort of necessity, but from the historically developed traditions of the text type law. Here, considerable improvement in comprehensibility can be achieved without a loss of accuracy by simplifying syntactical structures and shortening long sentences. This is also true for other typical means of comprehensibility like

structuring into manageable units, appropriate titles, consistent terminology, etc.

The dimensions *structure, brevity* and *motivation* are meant to be understood similarly to the dimensions structure/order, brevity/conciseness as well as stimulating additions of the Hamburg Comprehensibility Concept (Hamburger Verständlichkeitsmodell) (Langer et al. 1974). *Distinctness* means accentuating important content with suitable means, e.g. typographical (bold face or italics, type size), explicitly verbalised ("Important! Please note that…") or graphical means. As part of a concept of comprehensibility, *correctness* is a further important quality feature that is typically checked within the review process.

Finally, the special importance of the dimension of *usability,* the crucial external criterion for suitability for use in directly action-oriented texts, should also be noted. The methods of *usability engineering,* which were developed over the course of the last years, are also useful for the creation of comprehensible texts; here, the reader is increasingly considered a "user" (think of information systems, user manuals or forms).

4 Examples of different text types

In this last section, two text types from professional everyday life, the analysis and optimisation of which benefits from such a broad approach, shall be discussed briefly.

Specifications are usually the contract basis for principal and agent and thus important bridging documents. From a linguistic point of view, they are highly interesting as they should be worded in unequivocal terms and understood by all contracting parties. Usually, several specialised languages are used simultaneously here: one associated with the domain of the specialised application, one associated with the technical implementation and the legal jargon required to express legally binding elements. Specifications must neither be too detailed nor too superficial. Creation of extensive specifications is demanding in terms of effort, but they at least partially reduce the scope of interpretation for the contracting parties. Due to their complexity, they are seldom read entirely and

often are already obsolete at the onset of their realisation. However, brief specifications with little detail grant a larger scope of interpretation and leave (intentionally or not) room for *claim management* and subsequent negotiations.

It is advisable to develop a terminology for the optimisation of specifications that is as unambiguous as possible (glossaries, legal rules) and to use description languages that can be understood by both parties. This includes e.g. plans, diagrams, visualisations, scenarios, use cases, personas or modelling languages like UML, in accordance with each application domain and the depth of description. Formal descriptions are more exact than natural language, but often hard to understand for non-experts; visual descriptions are particularly suitable to display procedural information, but additionally, always require natural language.

Uniform structures of specifications with guidelines that consider content lead to the standardisation of document structures. Thus, important subjects are less likely to be forgotten by the authors, and specific content is more easily found by the readers. But such standardisations can even be exceeded: *Smart contracts* are currently an exciting topic in legal informatics. These refer to the (semi)automated drafting of contracts where IT-systems agree on "the small print" and the human beings only have to spell out the more complex issues (Clack et al. 2017).

Process descriptions play a vital role for the design of work flows in many sectors, from production plants to hospitals or pure service providers like call centres (Wagner/Käfer 2017). Here, the close functional relationship between description and realisation is of central importance, as there would otherwise be a danger of "documented" and "experienced" processes drifting apart, which is a common problem in quality management. All boundary conditions and dimensions of comprehensibility mentioned above are relevant, especially target group orientation, visualisations, terminology, situational factors and the right balance between level of detail and abstraction. Linguistic comprehensibility in the narrower sense remains important here, but nonetheless in close interaction with other factors in order to achieve user-friendly processes at large that ideally should be checked in terms of their suitability by applying *usability tests.*

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Silvia Hansen-Schirra and Silke Gutermuth

Empirical examination of comprehensibility

1 Methods to measure comprehensibility

First and foremost, the production of accessible texts is concerned with the optimisation of comprehensibility for its readers. For example, there are rules for Easy Language (see Maaß 2015, Bredel/Maaß 2016) that presumably improve the comprehensibility of texts. The effect of these rules on the complexity of texts can be measured using product-based methods. Nonetheless, it is not clear yet whether reduced complexity actually has a positive effect on processing effort during text reception. This can also be investigated empirically but requires process-based methods that take a closer look at text reception. In summary, empirical research on text production and text reception is needed to arrive at conclusions about the efficiency of rules that are designed to improve comprehensibility in accessible communication.

The validity, quality and significance of empirical research depend greatly on the methodological design and the choice of instruments. Therefore, texts as a result of a production process are directly accessible to empirical research, but cognitive reception processes and attributes of readers including e.g. intention or motivation, can only be observed or rather measured indirectly and thus require a more complex operationalisation. Depending on the research question and the research context, the examinations of the effectiveness of text production and the efficiency of reception can differ. Therefore, it is beneficial to have an overview of the instruments that are available for this purpose.

Krings' (2005) overview of different methods for data collection (see Figure 1), which was originally developed within translation process research, provides suggestions for categorising these methods in the context of empirical research as a first introduction to the topic. From a linguistic and psycholinguistic point of view, this overview can largely also be adapted for the mea-

surement of text complexity and reading comprehension (see Hansen-Schirra/ Gutermuth 2015):

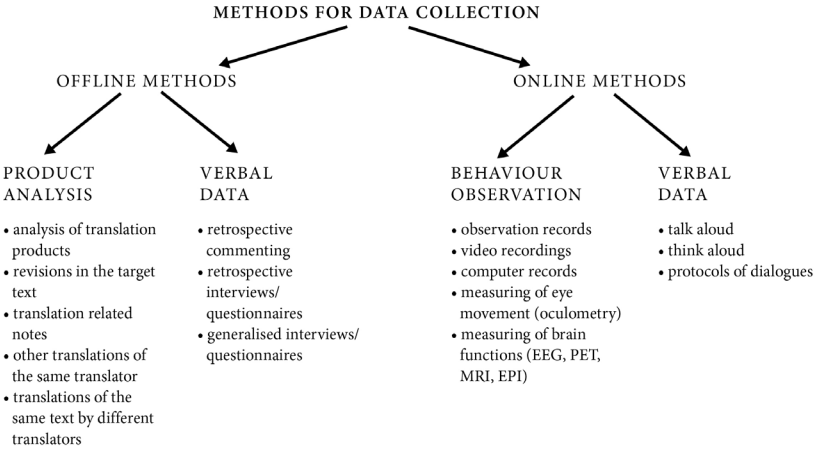

Figure 1: Krings' typology of data collection methods in translation process research (2005: 348)

Based on the point of time of the data collection, Krings first distinguishes between *offline methods* and *online methods.* Within each of these methods, he then differentiates between product-oriented methods and process-oriented methods on the one hand, between the collection of retrospective and introspective verbal data on the other. Qualitative and quantitative data can be collected for both methods.

Krings allocates a temporally subordinated character to the offline methods and defines them as methods that can be applied after an experiment (post-actional). This includes product analysis and retrospective verbal data. The latter add supplementary qualitative information to the product data and therefore increase their validity.

Data collection methods that document the (reception) process have to proceed in parallel to that process (periactional). Consequently, online methods take place in real-time and exhibit, according to Krings, the features of an observation. Therefore, he summarises these methods using the generic

term *behaviour observation*. In most cases, these methods used are supported by machines and mostly require high-tech devices, which is why they are often associated with a high investigation effort. The simultaneity in the collection of verbal data is expressed through introspection as a counterpart to retrospection.

Since not all data collection methods presented by Krings are useful for the empirical investigation of comprehensibility, the following presentation and differentiation of the methods relating to the state-of-the-art in linguistics and communication science will be accordingly adjusted without any claim to completeness.

2 Measuring production complexity

Readability research can be considered the dawn of empirical research into text comprehensibility (see also Christmann/Groeben in this volume). Readability research analyses texts at the surface level, takes objective text features into account and develops certain language statistical formulas based on the quantifiability of text features allowing for conclusions on the readability of the texts. Assuming that readability suffers when long sentences or long and complex words are used, a majority of the formulas evaluates the text as a function of average sentence length, number of words or syllables, or complexity of the sentence.

2.1 Readability formulas

The probably best known readability formula is the *Flesch Reading Ease Score (FRE)* that was developed in the 1930s for the Anglo-American language area. Its adaption for German in 1978 is known as the *Amstad formula.* Both formulas are named after their developers. The Amstad formula considers average sentence length in words (ASL) and the average number of syllables per word (ASW) and is calculated as follows:

$$FRE_{Amstad} = 180\text{-}ASL\text{-}(58.5 \cdot ASW)$$

A scale from 0–100 is used as the basis for the rating, given that: The higher the calculated value, the easier the text will be understood.

Other well-known readability formulas for the German-speaking area are the SMOG Index, the LIX readability index and the Vienna non-fictional text formula (Wiener Sachtextformel) (see Wolfer 2015 for an overview).

For a long time, readability formulas were considered the only means of access to and indicators for the comprehensibility of texts. They are still frequently used today and retain their raison d'être, but users should be aware of their very limited informative value. On the basis of the criteria of the Flesch Reading Ease Score, even texts that are challenging with regard to their content can meet the requirement of using short words in short sentences and thereby also satisfy the terms of a high degree of readability. Therefore, a high score on the readability index does not automatically mean improved comprehensibility. However, a lower readability score will mostly indicate problems for decoding.

2.2 Corpus linguistic analyses

Technological progress and digitalisation facilitate the availability and processing of large amounts of electronic data, especially large natural text corpora that can be analysed for certain basic linguistic questions and assumed regularities or frequency patterns with the help of computer linguistic and corpus linguistic methods.

A simple method that is also used in linguistic typology is the compacting of the object for measurement via a computer algorithm (e.g. a ZIP program; see Juola 2008). With more complex methods, the different linguistic levels can be reproduced and their complexity can be modelled (see Lüdeling/Kytö 2009 for an overview). Feature analyses and part-of-speech tagging are established methods on the morphological and lexical levels. This enables compound fragmentation and the investigation of word formation phenomena like derivation, inflection etc. On the phrasal and syntactic level, chunking and parsing are used to detect phrases and syntactic functions and to analyse syntactic dependency structures and embedding levels. On the semantic level, disambiguation of semantic relations as well as automatic detection of anaphoric references (e.g. cohesive chains) can be achieved (see Lemnitzer/Zinsmeister 2006 for an introduction).

In parsing-oriented complexity analyses, the proximity of connected parts of a sentence as well as depth of embedding play an important role. With the help of such measurements, it is possible to predict that the processing workload for clauses that are far apart from each other will be higher. Other approaches follow a "non-local" counter model (e.g. Federmeier 2007) in which processing is contingent on the anticipation and projection of the pending parts of an utterance. Thus, parsing should be less complex at the end of the sentence because the recipient can usually predict the content (Konieczny 2000: 627–629 for an overview).

All these methods focus on linguistic means of expression while disregarding their effect on reception and processing. Methods that take a closer look at the latter are presented in the following.

3 Measuring processing effort

In the course of the advancement of readability research in the 1970s, the first cognitively-orientated models of comprehensibility emerged that explicitly considered the recipients. Text-external factors like prior and global knowledge, motivation, intention, situational context or physical and psychological disposition are identified and investigated as influencing factors on the success of the text-reader-interaction (see Christmann/Groeben 1999). Understanding is considered a process of interaction between the individual expectations of the recipient and the actual text (see Dermarmels 2010: 110).

3.1 Comprehensibility ratings

One established method consists of assessing text comprehensibility with rating scales. Consequently, the results of rating processes represent a momentary subjective opinion (see Lerch 2008: 66). They are usually presented in the form of scale models such as e.g., Likert scales or polarity profiles. In these cases, the time of assessment can be an important factor. Specific aspects of comprehensibility are selected and then assessed by a group of participants who are representative of the target group under investigation. As theoretical frameworks for the definition of these aspects, models for comprehensibility

are often used as a basis. Thus, for example, the following four relevant text dimensions are described in accordance with the Hamburg Comprehensibility Concept (Hamburger Verständlichkeitsmodell) (see Langer et al. 1993, see also Christmann/Groeben in this volume). Their influence on comprehensibility can be investigated empirically:

- simplicity/correctness
- order/structure
- brevity/conciseness
- stimulating additives

Other models focus on other perspectives e.g. interactional (Groeben 1982) or communication-oriented (Göpferich 2002). The latter explicitly caters to text-internal (text type) and text-external reference values (recipients) and integrates different approaches of comprehensibility research and neighbouring sciences (e.g. by involving mental models).

The most innovative advancement in this area is the Hohenheim Comprehensibility Index (Hohenheimer Verständlichkeits-Index, HIX). Various readability formulas underlie this index, which additionally integrates other text features (see Kercher 2013). Accessing different measurement values and supplying a selection of influencing variables (communicator factors, text factors, channel factors etc.) enable a very differentiated and precise analysis.

3.2 Verbal data

Krings uses the term *verbal data* to subsume data collection methods that explicitly request participants to express all thoughts and feelings about the given test situation either during or after the experiment. These verbalisations are documented and analysed and are then included in the overall analysis of the data. Verbalised verbatim records, also known as reproduction, fall into this category, too.

Introspection which is referred to as *Think-Aloud Protocols* (TAP) or *Concurrent-Think-Aloud Protocol* (CTAP) in specialist literature is a widespread psycholinguistic method of introspection (see Göpferich 2008: 10–11). In this method, the participant – while performing the given task – verbalises sponta-

neously and unfiltered all thoughts and feelings that come to his/her mind at that moment. These verbalisations allow direct insights into the conscious reception processes in the short-term memory (see Ericsson/Simon 1993) and provide information on the self-assessment and self-perception of each participant. The recordings of these verbal data are usually transcribed before they are evaluated. Frequent criticisms of this method refer to the completeness of the verbalised data: On the one hand, the participants do not express every thought, since the situation during the collection process is unnatural and, on the other hand, there could be interferences (see Göpferich 2008: 23) between task performance and verbalisation, so that distorting effects may occur and, in the worst case, neither the task nor the verbalisation can be completed which, in turn, would question their validity.

Retrospection, *Retrospective Think-Aloud Protocol* (RTAP), is often used when participants are requested to retrospectively comment on previously made and documented decisions by means of specific media (audio or video recording, questionnaire). This should be conducted, analogously to the TAP, on the basis of spontaneous and unstructured expressions of all thoughts and feelings about the experiment. In contrast to RTAPs, there are retrospective interviews that are also based on previously made and documented decisions but demand more concrete and selective requests (*probing*) about certain decisions.

In all retrospective methods, timing is of the utmost importance, since retention times and retention capacities of the working memory and of the long-term memory have to be considered. The longer the interval between the experiment and the instance of retrospection, the easier the information can get lost (omission) or is skewed (elaborations) (see Norman/Rumelhart 1975).

For **reproduction**, a differentiation can be made between free recall and cued recall. In the case of free recall, the participants are requested to report what they have heard or read to the best of their abilities and as completely as possible (see Rickheit/Strohner 1993: 103). In cued recall by contrast, the participant is given a word and has to reproduce the sentence from the text in which the word occurred. Both versions are easy to use. However, they share the disadvantage that it is not clear whether the participants remember the information because they have a good memory or because they understood

the text. It is also not clear to what extent previous and global knowledge as well as inference processes influence the results.

3.3 Tests of previous and posterior knowledge

Tests of previous and posterior knowledge are widespread methods in empirical research. Both are offline methods, however, Krings' definition has to be extended by the option of anteriority (pre-actional) here, since tests on previous knowledge are performed prior to the experiment or the given task. They are usually implemented as cloze tests, with multiple-choice techniques or questionnaires. Tests on previous knowledge usually serve as a means of activating or documenting existing knowledge prior to an experiment or given task as a basis for comparison to the level of knowledge after the experiment. As a result, the question about measurable growth of knowledge can be answered. These previous/posterior scenarios are often used in the areas of language skills or specialised knowledge.

In **cloze tests**, the vocabulary and the reading comprehension of the participants are tested by asking them to fill in gaps in a given text (e.g. Tuinman 1971).

In **multiple choice tests**, several statements related to one situation or possible answers to a question are already given and the participants have to mark the right answer(s) according to their knowledge and reading comprehension. Since the participants could potentially choose the right answer based on luck or guessing, this method has only limited significance in terms of retrieval of the level of knowledge or reading comprehension. It is, however, applied in empirical competence research (e.g. Zlatkin-Troitschanskaia et al. 2017).

In **questionnaires**, the choice and type of question as well as the according format of response are closely connected to the research question. For example, it is important whether the research is quantitative (testing a hypothesis) or qualitative (generating a hypothesis). It is also important to discern whether the research question relates to a feature or rather to the specificity of a feature. Questionnaires are frequently used as complementary tools to quantitative methods in order to add subjective aspects to the data and gain another perspective on the object of research. The response options can be presented as cloze texts, multiple choice, yes/no options, open or closed

response formats etc. Typically, questionnaires are used in language competence research (e.g. Hansen-Schirra et al. 2017). In the context of accessible language, they have to be adjusted and simplified to suit the group of participants (e.g. by using pictures; see Bredel et. al. 2016).

3.4 Behaviour observations

In contrast to the mainly subjective qualitative methods outlined in the previous chapter, the approaches in behaviour observation presented in this chapter are associated with objective quantitative measurement methods as devices or external persons (researchers) usually record the data over time. Quantitative measurement methods significantly minimise the bias of the participants' subjective influence on the process of data collection (see Döring/Bortz 2016: 502). At the same time, they do not reveal the motivation or subjective experience of the participants.

Screen recording software records all screen pages visited by a participant in real time (see Göpferich 2008: 53). It also records verbal data. Thus, for example, search paths in the context of text reception can be retraced.

During **keylogging**, a software records all keystrokes as well as mouse and cursor movements of a participant. This software provides a protocol of the writing process, which can be analysed for pauses, errors, deletions and corrections. Thus, for example, the process of taking notes during text reception or processing strategies during text production can be recorded (see e.g. Carl et al. 2008).

Eye tracking is a device-supported method that enables the recording of participants' eye movements on system interfaces (screens, mobile devices etc.) (see Holmquist et al. 2011; Duchowski 2003). During this process, the respective camera technology records infrared waves reflected by the cornea of the eye and thus allows for determination and reproduction of the position of the pupil. The eye-mind hypothesis by Just and Carpenter (1980) assumes that what is fixated by the eyes is immediately cognitively processed as well as syntactically and semantically categorised. Based on this assumption, conclusions about cognitive processing and the readability of texts can be drawn from parameters such as length, number or direction of the fixations as well as reading time (e.g. Carl/Dragsted 2012). Modern eye trackers are non-invasive

and thus allow for data collection in an experimental context that participants usually do not perceive as obstructive, since the reading situation is as natural as possible. This is an important aspect for general transferability of the results. This aspect is often referred to as ecological validity. Ecological validity is a component of the quality criteria in empirical research and refers to the similarity between experimental conditions and the lifeworlds of the participants. The 'more natural' (more similar) the conditions, the 'more valid' and thus more transferable the results. The latter two methods are frequently combined to simultaneously conduct research on production and reception processes (e.g. Kruger 2016).

3.5 Physiological and neurophysiological methods

In an experimental context, physiological methods investigate reactions and changes of the peripheral nervous system like heart rate, skin resistance or changes to pupil size in real time (see Rickheit and Strohner 1993: 120).

The **electrocardiogram** (ECG) records the electrical activity of the heart muscle by measuring and recording electrical voltage changes of the skin via electrodes. An ECG recording device and electrodes are required for the measurement. The results can be interpreted either in reference to the emotional behaviour of the participants or their physical performance (see Katkin et al. 1993).

Measurement of skin resistance (electrodermal activity or galvanic skin response, EDA/GSR) benefits from the fact that electric skin resistance decreases measurably when the activity of the perspiratory glands increases due to exertion or emotional excitement. A polygraph as the recording device and electrodes are required for these measurements. Like the previous method, the results can be interpreted either in reference to the emotional behaviour of the participants or their physical performance (see Langner et al. 2015).

Pupil reactions, or more precisely pupil size, are being investigated in terms of their suitability to measure cognitive load. The higher the cognitive load, the larger the pupil (see Beatty 1982). Due to the pupil's highly sensitive reaction not only to psychosensory but also to other sensory stimuli, the quick response time is an advantage and at the same time a disadvantage. Pupil reactions can be recorded non-invasively by using eye trackers (see e.g. Seeber 2013).

Neurophysiological methods are based on the possibility of drawing conclusions about processing in the brain from specific neurophysiological reactions. The **electroencephalogram** (EEG) makes **event related potentials** (ERP) measurable in the brain, which reveal themselves as reactions to a stimulus when positive or negative voltage components change. Thus, it can be shown to what extent specific brain areas are activated during the experiment (see e.g. Kutas/Hillyard 1980, Christoffels et al. 2007).

Neurophysiological methods that enable visual location of particular brain regions during activation are called imaging methods.

Functional magnetic resonance imaging (fMRI) is a method to illustrate the brain's metabolic activity by generating a strong magnetic field. This method visualises the blood's increasing oxygen concentration that occurs in the case of activation of brain areas during speech production or reception (see e.g. Nagels et al. 2012). Due to high spatial resolution, the fMRI can depict neuronal activity in a more detailed manner than the EEG (see Döring/Bortz 2016: 499). Although this method is safe, it is an unnatural situation for the participants, who must remain motionless while lying in a narrow tube for the duration of the experiment. In addition, the fMRI produces loud thumping sounds that participants could perceive as unpleasant.

The **positron emission tomography** (PET) highlights areas of increased brain activity while processing language by using radioactive markers in the blood (see e.g. Young Kim et al. 2017). In this method, the participant receives an injection with slightly radioactive substances in safe dosages into the bloodstream while a PET scanner records the substance's distribution and a computer tomograph dispenses it (Acatech 2017: 23). In this method, the participants must also stay in an unnatural position and remain as motionless as possible.

All imaging methods are very costly, time-consuming and require a great deal of expertise in collecting data, operating devices as well as evaluating results. Imaging methods are a massive intervention in the natural environment of the participants, thus their ecological validity (i.e. in reference to authentic situations of speech processing) is usually very low. Additionally, these methods are not tolerable for certain recipient groups of accessible communication. An advantage is that these methods provide very detailed and above all very accurate measurement data in terms of time. As these data can only be eval-

uated quantitatively, an isolated analysis is insufficient in answering the question of comprehensibility. In research practice, therefore, imaging methods are often combined with other methods.

4 Interaction between production complexity and processing effort

As each method has its advantages and disadvantages, the mixed methods approach or data triangulation (see Döring/Bortz 2016, Alves 2003) have become established in empirical research. This approach may result in so called reading corpora, which integrate corpus linguistic annotations and eye tracking data in the respective texts. English-language examples include the UCL Corpus (Frank et al. 2013) and the Dundee Corpus (Kennedy 2003). German-language examples include the Potsdam Sentence Corpus (Kliegl et al. 2006) as well as the Freiburg Legalese Reading Corpus (Wolfer 2017). However, both German reading corpora are comprised of incoherent single sentences. Although this experimental design is typical for cognitive science experiments, the examination of the data is less authentic in regard to the processing costs due to the lacking context. For this reason, two exemplary projects will be introduced in the following. In each project, a reading corpus was compiled with authentic texts to investigate the interaction between text characteristics and their impact on comprehensibility. In this way, the interaction between production complexity and processing effort becomes empirically measurable. One project focuses on accessible language while the other addresses a broader recipient group by using popular scientific texts.

The project *Understanding Science* (Wolfer et al. 2015, Müller-Feldmeth et al. 2015) focuses on the complex interaction between text characteristics and the comprehension process in the popular science discourse. Text analyses and experiments that record text processing were combined to investigate comprehensibility. These analyses are based on a reading corpus of a compilation of German popular scientific articles from various fields (approx. 500,000 words), reporting on new developments or explaining scientific topics. The corpus was annotated on several linguistic levels (e.g. in terms of termino-

logical density or phrasal and syntactic complexity) to further investigate text type specific characteristics of popular scientific texts. Furthermore, the corpus was supplemented with information about reading behaviour and comprehension that were collected in experiments: eye tracking data, results of pre- and post-knowledge tests conducted with lay persons and comprehensibility ratings of experts and lay persons. This combination of methods allows for quantification of typical text type characteristics as well as for assertions about whether these characteristics have a positive or negative impact on reading behaviour and therefore also the comprehensibility of texts for different recipient groups.

The results demonstrate (Wolfer et al. 2015, Müller-Feldmeth et al. 2015) that texts referred to as more comprehensible according to the questionnaire are generally read quicker than texts that are rated as less comprehensible. Furthermore, a high terminological density results in longer reading times. This effect is weaker for texts that were rated as more comprehensible. Additionally, the participants of the reading study were able to benefit more strongly from their prior knowledge when reading a text that was more comprehensible according to the questionnaire study. Moreover, the results indicate that texts with hidden complexity that have a high degree of language economy and require inferential capacities, are easily read and understood by experts but incomprehensible and difficult to read for lay persons. On the one hand, these analyses demonstrate that the subjective comprehensibility of a popular scientific text could affect many levels of the comprehension process. On the other hand, they also illustrate the complexity of how text characteristics, individual knowledge and actual reading behaviour interact.

Empirical studies on the comprehensibility of legal texts in the context of the above mentioned Freiburg Legalese Reading Corpus highlight the same complexity. Triangulation of eye tracking results with syntactic annotation revealed that, in manipulated sentences with three degrees of syntactic complexity, the medium degree of complexity resulted in best readability (Wolfer et al. 2015). This finding disproves that assumed reduction in complexity of the easiest variant really requires the lowest processing effort.

In the project *LES is more* (Hansen-Schirra/Gutermuth 2018), a similar method mix was tested with regard to the reception of Plain and Easy Language

in the context of accessible communication among the relevant recipient group. A small corpus, comprising websites of the Ministry of Social Affairs, Labour, Health and Demography of Rhineland-Palatinate in Germany, was translated into German Plain and Easy Language and analysed corpus linguistically for morphological, terminological, phrasal and syntactic complexity. Additionally, eye tracking data of different recipient groups (people with disabilities, people with a migration background, older people, students as a control group) was collected, comprehensibility tests were conducted and recall tests were performed.

On the basis of corpus annotation, typical characteristics of the different text variants were quantified and compared to the rulebooks of German Easy Language (e.g. Maaß 2015) and empirically validated. The easier the text variant, the less complex the text variant regarding the different linguistic levels. First pilot analyses regarding reading data of the primary target group (people with disabilities) illustrate that texts in German Easy Language meet the assumed expectations of comprehensibility, as they had by far the shortest average reading time compared to German Plain Language and the original website texts. If these reading times are triangulated with the collected corpus results as well as the comprehensibility and recall tests, it can be assumed that this phenomenon is a consequence of the reduced complexity at the phrasal and syntactic levels (see Hansen-Schirra/Gutermuth 2018). If complexity reduction on these levels is guaranteed, the complexity on the morphological level seems to be less problematic and has – depending on the recipient group – no or only a small effect on reading times and comprehensibility (see Gutermuth 2020).

On the one hand, it can be concluded that characteristics of accessible communication are measurable with the support of computer and corpus linguistic methods and that statements about text complexity can be deduced on this basis. On the other hand, methods from cognitive science and comprehensibility research enable an understanding of the impact of these characteristics and their complexity on comprehension processes and the comprehensibility of the texts. Both projects, in which reading corpora were compiled and examined, highlight in an exemplary way how the interactions can be empirically

analysed, what kind of predictions can be made on this basis and where there is potential to optimise the comprehensibility of accessible communication.

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Julia Dobroschke and Thomas Kahlisch

Accessible information and communication offers for the blind and visually impaired

1 Legal foundations

The term accessibility was defined in the Act on Equal Opportunities for Persons with Disabilities (Behindertengleichstellungsgesetz, BGG) in 2002 as well as in the corresponding laws of the federal states. In addition to the requirements for structural and spatial design of the environment, the Act on Equal Opportunities for Persons with Disabilities focuses on accessibility to information and communication offers, which is of the utmost importance for blind and visually impaired people. Technical information processing systems and their user interfaces in particular must be developed in such a way that they can be used "generally without outside help" by people with visual impairments (Behindertengleichstellungsgesetz 2002; Act on Equal Opportunities for Persons with Disabilities 2002; English translation of the German original).

The Acts on Equal Opportunities for Persons with Disabilities oblige federal and state authorities and institutions to make their information and communication services accessible. The Ordinance on Barrier-Free Information Technology (BITV) defines the criteria for accessible design of information systems. The Ordinance on Barrier-Free Information Technology (BITV 2.0) is based on the internationally valid Web Content Accessibility Guidelines (WCAG) developed by the World Wide Web Consortium (W3C) (Bundesministerium der Justiz und für Verbraucherschutz 2011; German Federal Ministry of Justice and Consumer Protection 2011; Web Content Accessibility Guidelines 2009). Furthermore, in 2016 the European Union's Directive (EU) 2016/2102 on the accessibility of websites and mobile applications in the public sector (EU Directive 2016) was published. Its implementation in the Federal Republic of Germany was required by September 2018 (accessible web design n.d.).

In addition to the general legal foundations, copyright regulations for accessible literature also have to be mentioned. Since 2004, for example, there have been copyright limitations in the German copyright law permitting stakeholders to transform non-accessible literary works into works that are accessible to people with disabilities (Act on Copyright and Related Rights 2003). With the Marrakesh Treaty adopted in 2013 at the initiative of the World Intellectual Property Organization (WIPO), a decisive international copyright regulation has been added. It facilitates access to published works for people with reading and visual impairments by prescribing appropriate legal regulations (German Institute for Human Rights 2018). Decisive innovations to be implemented by the Federal Republic of Germany by October 2018 are (EU Directive 2017; EU Regulation 2017):

- extending the target group to include people with disabilities who cannot read printed works independently,
- the right to make works publicly available to the target groups,
- as well as the right to cross-border exchange of accessible works (ibid.).

2 Communication among the blind and visually impaired

In the following sections, both the special features of the writing system for blind people and special requirements for the design of texts suitable for people with visual impairments are presented.

2.1 How blind people read and write Braille

Blind people perceive their environment acoustically to a large extent, but can also compensate for their missing eyesight through haptic information. Braille, a writing system consisting of six dots, developed by Louis Braille, is used to read and write. Initially, there are 64 possible combinations. There are three different levels of encoding (Figure 1). In so-called uncontracted Braille, each letter is represented by a specific combination of raised dots. The system

contains different groups of letters that build on each other and thus facilitate the learning of Braille. The letters 'a' to 'j' belong to the first group. These are composed of relatively simple dot combinations. In the second group, containing the letters from 'k' to 't', dot 3 is added to the dots of group 1, in group 3 (letters from 'u' to 'z') dot 6 is added. So-called "Vollschrift", which in German Braille is a version of contracted Braille that shortens frequently used groups of letters into own cells (groups 3 and 4), already contains Braille characters for letter combinations, reducing the size of the Braille cell (e.g. ie, sch). The most economical form of Braille, however, is based on short notation, in which frequent syllables or short words are often represented by only one Braille character (Mellor 2009: 98 sq.)

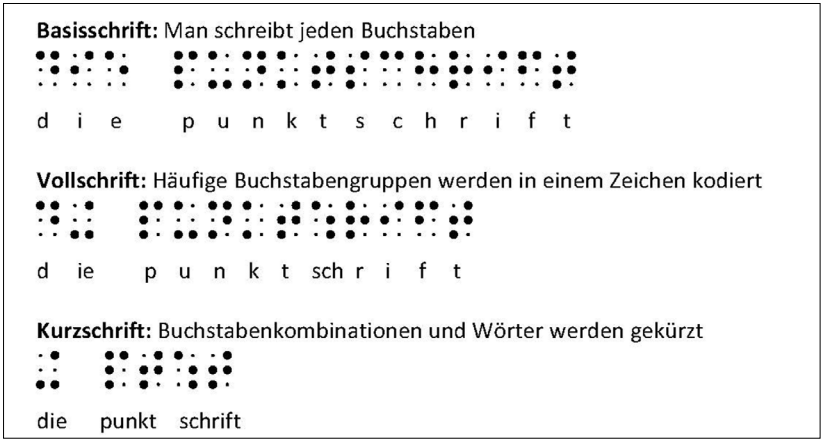

Figure 1: Various Braille notations for German (Kahlisch et al. 2011: 4)

Even when presenting content in e.g. contracted Braille, it must be taken into account, that the length of the books will be considerably increased in comparison to black-print books. The Braille characters have fixed sizes for point diameter, point spacing within the Braille cell as well as a tactile minimum height. The entire Braille cell is designed to fit under a fingertip. All parameters for size and use are defined in DIN 32976:2007-08 and must be observed for book contents and informational texts on orientation plans (Beuth Verlag GmbH 2014, Beuth Verlag GmbH 2015). Since the character set of 64 point

combinations is limited, Braille characters are often context-dependent. Consequently, special notations are also defined for the representation of mathematical equations or musical notes (Staupendahl 1998: 68 sq.).

Blind people read by perceiving and identifying the dot combinations of the raised dots through the receptors in their fingertips. The index finger on one hand is often the main reading finger, the other fingers are used for orientation on the page, for example to explore the end of a line or paragraph. A blind reader cannot get an overall impression of a page, as is possible for sighted readers, because unlike visual information reception, perception of contents is only possible line by line and one after the other.

A Braille typewriter can be used to take notes. With the six available keys, the respective dot combination can be activated by simultaneously pressing the corresponding keys for the desired letter. The space bar in the middle of the keyboard creates a blank space. Braille can also be written with a converted PC keyboard. However, digital texts are usually written using touch typing. Board and graver also constitute writing materials, but belong to the analogue tools and require inverse spelling (Mönnig 2016: 60 sq.; Lang 2003: 154 sq.).

The preparation of information for blind people should be as close as possible to the original. Due to the necessary linearisation of the information for blind readers, however, this is hardly feasible in the case of more complex designs. Therefore, orientation, retrievability and quotability play a special role in reading. This can be facilitated by using the page numbers of the original title and the page in the Braille version, footnotes as well as potential column titles that are placed in a footer.

2.2 Publication requirements for the visually impaired

People with severe visual impairments generally use black-print for reading and writing. In contrast to people with good eyesight, the processes of reading and writing take an enormous amount of time and physical effort, and require the full concentration of the reader due to the severe visual and the associated motor impairments. Assistive technologies such as optical magnifiers (e.g. cameras, magnifiers) are often used to compensate for the visual impairment (Hofer 2008: 52).

The basic principles of good typographical composition should be observed in order to develop printed or digital content suitable for people with visual impairments. The respective requirements for the legibility of a text are listed, for example, in DIN Standard 1450:2013-04 (German Institute for Standardization/Deutsches Institut für Normung e. V. 2013: 4; DBSV 2018): Nevertheless, visual impairments entail different perceptive limitations, so that specific adjustments may be necessary (Zeun 1998; Hilderley 2013: 23 sq.). These include, among other things, inserting (additional) caption texts that can be presented in the header or footer or in marginal columns to add a complementary content-related structure to original texts. In contrast to the original, important terms can be magnified or set in bold. It is also possible to include special characters at the beginning and ending of chapters in order to facilitate improved orientation on the page. An overview of supplementary structural elements must be made available in published books, for example in the preface (Zeun 1998).

In principle, attention should be paid to a uniform and easily recognisable structure and design. The size and contrast of the illustrations should be appropriate (ibid.; National Council for the Blind of Ireland 2009: 6). Intensifying contours and reducing image content to the essential provides additional support. If this is not possible, or if reducing the content does not achieve the desired result, preparing images as tactile graphics can help to make them accessible. Underlining, framing or using a clearly recognisable contrast colour for keywords as well as a pagination on the outer edge of the page can help with orientation. If tables or directories are used to display texts, auxiliary lines, for example, can lead to the text elements that are marked in larger and bold fonts (ibid). Matt and non-glare papers should be used for print media. It is considered an additional convenience for readers if a book that is to be used e.g. in a so-called screen-reading device can be opened easily (Zeun 1998; National Council for the Blind of Ireland 2009: 7).

Criteria lists that were created for people with reading or visual impairments generally contain rules for good text and layout design in order to support orientation on the page. The guidelines of Zeun (1998), Hilderley (2013), of the German Institute for Standardization (DIN) and the National Council for the Blind of Ireland (2009) are given special consideration here. A

clear, simple and consistently designed layout with a ragged right alignment should be developed as the irregular line lengths in the ragged alignment make it easier to find the next line. The lines should not have more than approx. 40 characters per line (Hilderley 2013: 23).

In addition to the term 'Großdruck' ("large print"), which has found its way primarily into the commercial sector and defines font sizes between 12 and 14 pt., the term 'Maxidruck' ("maxi print") has become established in text typesetting for people with severe visual impairments. Recommended font sizes for supporting text design are those that are at min. 20 pt. (DZB 2017). Zeun (1998) also recommends the use of sans serif fonts for running text. However, studies have shown that this does not necessarily have an impact on legibility for readers with visual impairments (Beck 2014: 269 sq.). When selecting the font, factors such as recognisability, distinguishability, openness and the constrast of the width should be taken into account in connection with the planned medium (DBSV 2018a). There are also specially developed fonts such as "Tiresias" (RNIB 2013) or "Frutiger 1450". The latter is named after DIN standard 1450 on font legibility (Beuth Verlag GmbH 2013) and is recommended to achieve texts that are easy to read (DBSV 2018b; DZB 2017). Both fonts have several font styles, are clear, well designed and do not use ligatures to ensure the recognisability of individual letters (Dyslexia Research Center AG 2012: 7; Hilderley 2013: 23).

Further information on the treatment of special characters such as footnotes or mathematical characters can also be found in the guidelines mentioned above (Zeun 1998; DBSV 2018a). Designing texts for people with visual impairments also means using sufficiently high contrasts in the typeface, e.g. clear separation of headings from the running text and sufficiently large line and paragraph spacing to avoid undercutting ascenders and descenders (Zeun 1998; National Council for the Blind of Ireland 2009: 4). Due to the contrast between text and background colour, illustrations behind the text should generally not be used. A sparing use of uppercase letters or blocked terms for word design is also recommended (Hilderley 2013: 23). Depending on the visual impairment, inverse display of texts (e.g. white writing on a black background) can be used to achieve a further variant of highlighting headings or short notes (Zeun 1998; National Council for the Blind of Ireland 2009: 7).

3 Media for the blind and visually impaired

Visual impairments can have varying degrees of impact on a person's visual perception. Therefore, special media that are adapted to certain needs and abilities of the users, e.g. reading Braille, were developed. In addition, media that are not only accessible to a certain target group, but can also be used by many people have been established. The following sections provide an overview of these media.

3.1 Reading books: in Braille, as an audiobook or an e-book

Literature in Braille is transcribed by and can be borrowed from institutions such as blista Marburg or DZB Leipzig (The German Centre for Accessible Reading). The Braille libraries and audio libraries in the German language area are united under the umbrella of the Media Association for Blind and Visual Impaired People (MEDIBUS). A list of all members can be found on the MEDIBUS page (MEDIBUS n.d.). The nine largest MEDIBUS libraries are:

- Berlin: Berliner Blindenhörbücherei gGmbH (Berlin Audio Library for the Blind)
- Bonn: Deutsche Katholische Blindenbücherei gGmbH, DKBB (German Catholic Library for the Blind)
- Hamburg: Norddeutsche Blindenhörbücherei e.V., NBH (North German Library for the Blind and Visually Impaired)
- Leipzig: Deutsche Zentralbücherei für Blinde, DZB (The German Centre for Accessible Reading)
- Marburg: Deutsche Blinden-Bibliothek (DBB) der Deutschen Blindenstudienanstalt e.V. (German Library for the Blind of the German Research Centre on Blindness)
- Munich: Bayerische Blindenhörbücherei e.V., BBH (Bavarian Audio Book Library for the Blind)
- Münster: Westdeutsche Blindenhörbücherei e.V., WBH (West German Audio Book Library for the Blind)

- Vienna: Hörbücherei des Blinden- und Sehbehindertenverbandes Österreich (Audio Book Library of the Austrian Federation of the Blind and Partially Sighted)
- Zurich: Schweizerische Bibliothek für Blinde, Seh- und Lesebehinderte, SBS (Swiss Library for the Blind, Visually Impaired and Print Disabled)

Since the 1950s, special libraries for the blind and visually impaired have been offering audio books and audio magazines, which are recorded in their entirety by speakers in the studios of the MEDIBUS libraries. The titles are then stored on audio carriers and sent for free to users who are entitled to borrow them. Initially recorded on tape reels, later on compact cassettes, the titles are now produced in the Digital Accessible Information System (DAISY) format. The DAISY format is an international standard that allows for navigation of audio content. Thus, the listener is able to browse through an audio book, find a specific location and adjust the playback speed. All MEDIBUS libraries have been offering audio books and magazines in DAISY format for download for several years. Users can choose from the offered range via a web catalogue, various apps for mobile devices or special playback devices such as Plextalk Lineo Pocket or Victor Reader Stream.

The functions for marking up navigable and multimedia DAISY contents as well as the accessible design of digital publications were incorporated into the development of the e-book format electronic publication (EPUB) (DAISY Consortium n.d.). The EPUB format is supported on well-known e-readers, reading apps, tablets and PCs due to its platform-independent and accessible design (German Publishers and Booksellers Association – Börsenverein des Deutschen Buchhandels e.V. 2017). EPUB books can also be read via web readers. An example for such a web plugin is "readium", which was developed by the International Digital Publishing Forum IDPF and W3C as open source software and is being gradually expanded by various international committees (Readium Foundation 2018). If publishers consistently adhere to the guidelines and standards for accessible publishing, their content can be offered directly to blind and visually-impaired users.

3.2 Using digital content via assistive technologies and mobile devices

Thanks to assistive technologies, blind people can work with computers just as well and as efficiently as sighted people. For this purpose they use, for example, a so-called Braille display (see Figure 2), which is connected to a computer in addition to the keyboard and allows the user to read digital texts in Braille. In this case computer Braille, which has an eight dot notation instead of a six dot notation, is used. The movable pens on the line form the Braille letters in a raised position and enable tactile reading of digital content.

Figure 2: A Braille display combined with a PC keyboard (DZB 2014)

So-called screen-reading devices are used for auditory support in order to enable texts on the Internet, e-mails or documents to be read aloud. Such assistive technologies rely on the structure of the content, which is why appropriate processing is a prerequisite for equal access for the blind and visually impaired. Media-neutral formats such as HTML or XML provide a technical infrastructure for this and enable headings, alternative texts for images or interactive elements such as references or links to be recognised as such.

In addition to magnifiers or cameras, people with severe visual impairments also use magnifying software on the computer to achieve the required text size. In this case, it is beneficial if texts are well-structured and linearised.

A double page layout with numerous design elements often leads to problems concerning orientation in a document if the structure has a significant visual design.

Mobile devices also offer blind and visually-impaired users a wide range of possibilities to access information independently and to communicate with others. In addition to notebooks with Braille display and voice output or Braille notebooks specifically designed to meet the needs of users, many blind and visually-impaired people have been using tablets and smartphones available on the mass market for several years. The most common systems, Android and iOS, offer many operating aids that allow users with visual impairments to use these devices without external help, even though they are operated via touchscreen. With a little practice, the user will be able to use these devices intuitively through gestures. Tablet or smartphone users can decide for themselves whether they need the support of a magnifying display, a screen reader and/or a Braille display to interact (DBSV 2018d).

The operating aids offered by the manufacturers ensure that the devices can always be operated and that no expensive additional software has to be purchased. To ensure that the numerous third-party apps can also be used by all users, the programs must meet certain requirements for accessible design, which are published on the manufacturers' websites. Requirements for mobile devices are now considered in the WCAG 2.1 (Web Content Accessibility Guidelines 2018).

3.3 Use of tactile devices and audio guides

Tactile reliefs and descriptive audio guides are used to give blind people a general idea of the spatial conditions. In both school and vocational training contexts, models, tactile illustrations and corresponding explanations are important in order to make connections recognisable. For this purpose, swell paper copies are generally used. For more extensive plans or atlases, the foil deep-drawing process is used, with which, for example, the relief of a mountain range or the shape of a building can be experienced haptically. Technologies such as the 3D printing process can also be used for the creation of models, which are used, e.g., for teaching purposes (Isar project n.d.).

Museums and other cultural institutions are increasingly integrating tactile models (ABSV n.d.). In order for visitors to an exhibition or installation to be able to move independently in the rooms, audio guides are also used to describe the exhibits that can be seen as well as the routes to the exhibits. By combining an audio guide with an interior navigation system, visitors are able to move freely within the exhibition area and to consciously decide which exhibits they want to experience. Audio guides work on specially developed devices or as an app on a personal smartphone. Using an app, visitors can continue to use the audio guide before or after their visit and access additional information. The accessible audio guide of the Bach Museum in Leipzig is an example of this (Bachmuseum n.d.).

3.4 Reception of visual content through audio description

Audio description (AD) refers to the supplementary description of a film or event. Since the 1990s, public service broadcasters have been using this technology to add an audio description to films. These explanations are generally only placed in the breaks between conversations in a film and are intended to clarify actions and connections to non-sighted viewers that cannot be deduced from the existing audio track. With the award of the German Audio Film Prize, the German Federation of the Blind and Partially Sighted (DBSV) has created a publicly perceived podium to raise awareness of audio descriptions (Deutscher Hörfilmpreis n.d.; Hörfilminfo n.d.).

For several years, broadcasting companies have been regularly expanding their range of films and documentaries (Müller 2013). Cinema operators are also offering more and more films with additional acoustic image descriptions, which can be heard through headphones. The "Greta" app, which synchronises with the current feature film and plays the film's audio descriptions (Greta&Starks n.d.), provides a shared film experience.

AD is also increasingly being used in the art and culture scene as well as in opera and theatre performances. There, the blind visitor is given explanations about the plot and the visual appearance of the actors via headphones. Schauspiel Leipzig is one of the first cultural institutions to regularly produce audio descriptions for plays (Schauspiel Leipzig n.d.). AD is also offered at

some Bundesliga matches in football or handball (DHFK n.d.), as well as the Olympic Games and the Paralympic Games (einfach teilhaben n.d.).

4 Summary

There are many different media formats for the blind and visually impaired that are tailored to the respective needs and abilities of the users. From the classic Braille book to tactile models or mobile applications and audio descriptions – the offers for using accessible media are becoming more and more available in cultural and social areas. Basic principles have to be taken into consideration to ensure the accessibility of these offers. First of all, it has to be examined to what extent means for communication should contain Braille and black-print. In both cases, it must be ensured that users can navigate book pages or digital media. For this purpose, there are primarily typographical means that meet the requirements for the production of such contents. In reducing the content to its key information, one further step towards improved orientation has been achieved. In order to support improved perception, the use of high-contrast elements for design and images is required. The latter should also be made accessible to blind people. Therefore, in the case of tactile images or, in the case of digital content, alternative texts have to be made available. The basic requirements have been integrated into different standards and, in the digital area, they are also legally binding as part of certain regulations. In addition to the theoretical foundations, it is imperative to include the target group in product development because guidelines and standards can only indicate a direction, while the individual case must always be considered.

The implementation of the European Directive (EU) 2016/2102 (in German federal, state and local authorities) will contribute to a more accessible design of information and communication offers in state institutions. Therefore, it is important that the means of evaluation and examination are used to promote this process and to ensure the quality of the offers.

Currently, there are no binding regulations by legislators to motivate the private sector to design accessible digital services and products. At the time

of writing this article, it was not yet clear which effects the discussed legal provisions would have on facilitating accessibility.

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Johannes Hennies

Prelingual hearing disabilities and literacy skills

Nowadays, people who are deaf or have been hard of hearing since birth have significantly better educational opportunities than ever before. A reason for this is the increase in scientific, social and legal recognition of national sign languages, such as e.g., German Sign Language (DGS), which means that they are now increasingly being used in educational and therapeutic work. Other reasons are early diagnosis, modern hearing aids and the cochlear implant (CI), which provide deaf and hard-of-hearing people with the ability to hear and, to some extent, the ability to learn spoken language at an age-appropriate rate. Despite these improved conditions, however, their literacy skills may still be limited. This article illustrates connections between hearing disabilities, the use of language and literacy skills, outlines the characteristics of the literacy skills of people with a prelingual hearing disability and finally, presents several consequences for educational, therapeutic and social work.

1 People with a prelingual hearing disability

Overall, the number of people with a prelingual hearing disability or a hearing disability developed during childhood is low. According to the German central register for early hearing impairments ("Deutsches Zentralregister für kindliche Hörstörungen"), 1.2 out of 1000 children are born with a hearing impairment in both ears (Gross et al. 2000: 879). This group in itself is extremely heterogenous, with different levels of hearing impairment, different types of hearing technology (hearing aid(s) and/or CI) and different primary languages (German, German Sign Language, other spoken and/or sign languages). What they have in common, however, is limited or even non-existent access to hearing, which can have a negative impact on the acquisition of spoken

language (for example German) and subsequently written language. In order to accurately describe these relationships, we will first outline the conditions for general language acquisition of people with hearing disabilities. The group can be described from the perspective of "a variety of disciplines" (Wisotzki 1994: 48; English translation of the German original) including, for example, a linguistic, sociological, medical-therapeutic or educational point of view. In addition, there is the discipline of "Deaf Studies" (Fischer et al. 2009), which explicitly incorporates the views of the affected persons in the scientific concept. Depending on their respective disciplines, different terms, with which various values are associated, can be used for the relevant individuals. If, for example, some of the deaf children are described from an educational perspective as having residual hearing (Löwe 1996: 48 and 49) then this should draw attention to the improved possibilities of hearing technology even for children who are audiologically considered "deaf". If, however, German adult deaf persons use the generic term "deaf person" for everyone who is deaf and hard of hearing with access to sign language, the term is used analogously to the English term "deaf" (Padden/Humphries 1991: 10) and aims to highlight that deaf people constitute a linguistic and cultural minority. In order to underline this perspective, the German language distinguishes the terms "taub" and "taublos" ('deaf' and 'deafless') from "hörend" and "gehörlos" ('hearing' and 'deaf') (Grote/Zäh 2016).

Therefore, it is necessary to justify the linguistic terms used in this article as there is no neutral designation for the target group. This article is based on the terminology defined by the classification instrument ICF (International Classification of Functioning, Disability and Health) of the World Health Organisation (WHO). According to the ICF, a disability is caused by limited social participation and not necessarily by impairments of bodily structure and functions such as e.g. a hearing impairment (DIMDI 2005). The decision to use the term "people with a hearing disability" as the collective noun is based on the unanimous resolution of the self-help organisations (including the German Federation of the Deaf and the German Association for the Hearing Impaired), agreed upon at the meeting of the umbrella organisation "German Association of the Hearing Impaired" (Deutsche Gesellschaft der Hörgeschädigten) in November 2016. The terms "deaf" and "hard of hearing" are used to refer

to the audiologically identifiable hearing status, whereby the members of the Sign Language community are mostly, but today no longer exclusively deaf or severely hard of hearing.

2 Acquisition of a primary language among people with a hearing disability

There are three possible primary languages that people with a hearing impairment can acquire, namely a) the sign language of the respective sign language community, b) the spoken language of the local hearing majority population and c) the written language. However, there are very few examples in the history of deaf or deafblind people who acquired their primary language entirely through written language.

a) Sign languages probably develop wherever a sufficient number of deaf people live together in a community over multiple generations (Meir et al. 2010). Until the end of the 19th century, they were also used regularly in hearing impaired education, but were then largely excluded from schools for over 100 years due to the order of the Milan Conference of 1880. It was only thanks to the empowerment movements of the deaf as well as the linguistic and legal recognition of the national sign language as a fully-fledged language that DGS reappeared in schools for the hearing impaired, for example as bimodal bilingual teaching concepts (initially in Hamburg in 1992) or as regular subjects (initially in Bavaria in 2001). Even when sign language was frowned upon in schools for the hearing impaired, the sign language community still taught it, for example in self-advocacy associations for the deaf. The direct transmission of language and culture, which is referred to as "oral tradition" in spoken-language cultures, is of considerable importance as sign language has no written form. In the 19th century, first pertinent experiments were carried out (Bébian 1825). SignWriting (Sutton 1981), in Germany "Gebärdenschrift" (Wöhrmann 2005), is a largely functional draft

of common script. However, SignWriting is rarely used in pedagogical contexts, for instance in initial language classes (Wöhrmann n.d.) and in German support classes for adult deaf people (Hänel-Faulhaber et al. 2012). There is no record of adult users of DGS who actually employ SignWriting in their daily routine. In deaf education, it was long assumed that the acquisition of the sign language would disrupt the acquisition of the spoken language and consequently the written language. It was also assumed that it would disrupt integration into hearing society (for example Schmid-Giovanni 1976: 25 and 26). However, no empirical evidence for this assumption exists, therefore it is considered obsolete today (Marschark/Spencer 2009). The extent to which a deaf or hard-of-hearing child learns DGS depends on several individual aspects. Only very few children with a hearing disability have a deaf or hard-of-hearing parent and therefore acquire sign language as a natural first language. According to research, this applies to between 2.3% and 8% (Große 2003: 34; Mitchell/Karchmer 2004). The majority of deaf people who use DGS as their primary language acquired it later in life, in some cases not until adulthood. Despite the increasing openness towards the use of DGS in early intervention (Günther et al. 2009) and in schools for the hearing impaired (Günther/Hennies 2015), it is not a given that profoundly hard of hearing or deaf people have early and extensive access to DGS in the German education system.

b) Since people with a hearing disability are surrounded by spoken languages and a hearing society, the acquisition of the best possible spoken language skills was a primary goal in hearing impaired education. Before modern hearing aids and the CI were developed, the spoken language was taught in articulation classes via speech-reading as well as through the feeling of articulation and the self-awareness of own speech organs. At the same time, alternatives like sign language were rejected. Even though some deaf individuals managed to acquire astonishingly good spoken language skills, it was an ineffective way to acquire a language for most pupils. In

addition, the acquisition of the spoken language was time-consuming, so that other subjects were neglected. After the development of modern hearing aids and the inner-ear prothesis cochlear implant in conjunction with more accurate and earlier diagnostics, the aural or auditory method gained acceptance in the 1980s. This method is intended to teach deaf and hard-of-hearing children spoken language via their now accessible hearing ability in the most natural way possible, meaning in spoken interaction between parents and their child (Diller 2009). Thus, more children are given access to at least approximately age-appropriate spoken language skills. Nevertheless, it has been proven that even under good conditions, the acquisition of spoken language is very sensitive to disturbances. Between 30% and 50% of children who are profoundly deaf or are hard of hearing have disturbed or delayed verbal development, even under good conditions (Geers 2006; Szagun 2010; Niparko et al. 2010). Even children who have a low to moderate level of hearing are more likely to have difficulties with language acquisition, for example with grammar, than children who are capable of hearing (Moeller et al. 2007; Delage/Tuller 2007; Wimmer et al. 2015). Representatives of the hearing-directed method mostly adopted a critical or even a negative view of the use of single signs or DGS as a language system from their predecessors who were supporters of the oral method (Diller 2009: 175). However, there is no reason to believe that a simultaneous teaching of sign language would prevent the acquisition of spoken language with hearing aids (Günther et al. 2009).

c) There are only a few cases where deaf or deafblind people initially acquired language purely through written language (Günther 1985: 48). The most famous example is the writer Helen Keller who lost her hearing ability and her sight when she was 19 months old. When she was seven years old, she succeeded in developing speech through written language, which was first conveyed to her as a touchable finger alphabet and later as Braille (Stern 1905). Apart from such individual examples, Günther (1993; English transla-

> tion of the German original) believes that the written language has often been the "actual basis of the verbal language for deaf people" because they would usually have learned the written form of a word in articulation class and thereby would have profited more from it than from imparting spoken language structures. In contrast to this, the education of the hearing impaired has traditionally been based on the assumption that the conditions are reversed. In his "Handbuch der Taubstummenbildung", Walther (1895: 259) states that the written expression, even of a deaf student, is generally contingent on verbal expression. He believes that "the faster and the more eloquently most students speak, the better they are able to write" (English translation of the German original). For this reason, until the end of the 1990s, the "speech correction aid: writing" (Schulte/Schlenker-Schulte 1983, W1820) was used for the improvement of spoken language, but it was not seen as an independent way for deaf people to acquire linguistic skills (Schmid-Giovannini 1976: 63 and 64).

Nowadays, it is increasingly recognised in hearing impaired education that people with a hearing disability generally benefit from the acquisition of more than one primary language. Due to further developments in hearing technology and the comprehensive introduction of neonatal hearing screenings in 2009, a diagnosis, supply of hearing aids and the beginning of an early intervention in the first six months of a child has become possible for deaf or hard of hearing children (Hennies 2010). At the same time, early diagnoses ensure that DGS can be taught right from the beginning. Both languages can influence each other in a positive way if they are taught with a clear concept of language acquisition, as is the case in both early intervention (Günther et al. 2009; Hofmann/Hennies 2015) and school (Günther/Schäfke 2004; Hennies/Günther 2015). Written language is still partly used as a supplement in early education (Stocker 2002), but it is no longer taught as a primary language.

3 Literacy skills of people with a hearing disability

Empirical studies of the past forty years repeatedly revealed the difficulties people with a prelingual hearing disability have in acquiring written language (an overview in Krammer 2001). However, some key statements can already be found in Conrad's (1979: 152) representative study of the reading skills of school leavers from schools for the hearing impaired in England and Wales, which were recently reconfirmed in the American "Stanford Achievement Test". In this test, the reading skills of deaf and hard of hearing pupils are measured at regular intervals in a representative norming sample of several thousand children and adolescents between 8 and 18 years of age (Holt 1993, Holt et al. 1997, Traxler 2000; Karchmer/Mitchell 2003): Deaf and hard of hearing school leavers achieve, on average, results that are similar to those of primary school students who are capable of hearing. Furthermore, hearing status has a decisive influence on the test results, whereby the difference between stronger and weaker pupils increases over time in their school careers. It can be assumed that it is not the hearing status per se, but the according spoken language skills that leads pupils to achieve better results in their written language skills. Therefore, other factors that hinder the acquisition of spoken language for people with a hearing disability have an equally negative impact on the acquisition of written language. These include, for instance, an additional impairment, a lower educational level of the parents or a migration background with corresponding spoken multilingualism in combination with the frequently lower socio-economic status (Hennies 2014). Study groups including children with a CI show that they develop better written language competence than deaf children from control groups who do not have a CI (Archbold et al. 2008). A reason for this is that children with a CI acquire spoken language better on average. However, even these children remain significantly behind the control group of children of the same age without a hearing disability and they display a wide variation in the results (Vermeulen et al. 2007: 289). Several other studies reveal that deaf people with a higher level of sign language skills tend to have better written language skills (Chamberlain/Mayberry 2000) and that early access to sign language enables similar skills in written grammar tests as those of adults capable of hearing who grew up with another mother tongue (Mayberry et al. 2002). In

a meta-study on the reading skills of deaf people, Mayberry et al. (2011) prove that the general level of language skills (in spoken or sign language) influences the results the most, so that 35% of the variance in the results can be explained. In contrast, only 11% of the variance in the results is predicted by phonological recoding and phonological awareness. The studies mentioned above therefore show that a primary language that is developed as much as possible is the best basis for successful acquisition of written language by people with a hearing disability. If certain conditions are fulfilled and if the child has access to technical aids, the written language can build on the spoken language. Nevertheless, its acquisition remains potentially problematic for children with a hearing disability. Written language can also build on sign language, to which deaf and hard-of-hearing children generally have unrestricted access, but which is often not immediately available to them from birth. If children have access to both language systems, both their primary languages can interact positively with one another during acquisition of written language (Günther/Hennies 2015: 98, 99, 100).

4 Acquisition of written language by deaf and hard-of-hearing children

The acquisition of written language by deaf and hard-of-hearing children can be influenced not only by general language requirements but also by the extent to which early stimulating childhood contact with writing is enabled. Overall, hearing parents with a deaf or severely hard-of-hearing child are likely to create a less language-stimulating environment for their child than they would for a child who is capable of hearing. Swanwick and Watson (2005) conducted a study that shows these effects on the socialisation of written language: They found that hearing mothers pay attention when reading aloud and that they are close to their deaf children, but they often ask them to name pictures and to utter certain words instead of talking about the content of the text. By contrast, mothers who are deaf themselves and learned sign language focus more on the stories told in books. It has been proven that deaf children benefit significantly in their vocabulary development if their parents use specific language

behaviours during shared reading, such as asking open questions and picking up and expanding on their children's answers (Fung et al. 2005). This has also been proven for parents of hearing children (Whitehurst et al. 1988).

Therefore, it can be assumed that a creative and linguistically encouraging interaction with written language material in early childhood also supports the later development of literacy skills of deaf and hard-of-hearing children. There are different kinds of models that explain how reading and writing skills are acquired in the narrower sense (Schründer-Lenzen 2013: 67, 73, 74). They all show that hearing children usually experience a phase in which they relate spoken and written language to each other. At the same time, they acquire phoneme-grapheme correspondence rules and actively use them in writing and reading. This "alphabetical phase" is of great importance for initial classes in German didactics. It can be prepared through exercises on phonological awareness in kindergarten as well as through didactical support of synthetic components of written language acquisition seminars (Hennies 2019). In order to acquire morpheme-based strategies in reading and writing in the "orthographical phase", children have to overcome the "alphabetical phase". Since respective didactics particularly strengthen speech-related acquisition methods, children with no or limited access to spoken language are at a disadvantage. Deaf children, for example, can still develop good reading and writing skills, even without a reference to sounds. Usually, they exhibit only few spontaneously varying misspellings for the same word, which are typical for the "alphabetical phase" of children who are capable of hearing (Günther 2003). But as children who are capable of hearing also have difficulties with the alphabetical phase, inclusive German didactics should offer not only a synthetic method but also equal analytical access, through which orthographic rules and morpheme structures can be acquired via visual pattern recognition and word fields that are preferably based on a large sight word vocabulary (Hennies 2019). Comprehensive data on the development of reading and writing exist, particularly from two bimodal bilingual school experiments in Hamburg and Berlin, which illustrate the course of written language acquisition independent of spoken language. For the first time, deaf students were encouraged to use sign, spoken and written languages equally (Günther 2011, Schäfke 2005). In addition, many comparative texts of deaf and hard-of-hearing children who

were not taught in a bimodal bilingual school were collected in the course of the project (Schäfke 2005). These deaf and hard-of-hearing children exhibit a generally lower text production competence, which indicates the necessity for analytic acquisition paths that are independent of the spoken language as a supplement to existing methods. However, there is hardly any didactical material for this purpose, which further complicates the acquisition of written language for deaf and hard-of-hearing children (Brinkmann 2015).

5 Use of written language by people with a hearing disability

Thanks to improved technical possibilities, people with a hearing disability now have even more access to phonetic information. Due to social and legal recognition, more information is available in DGS. Sources of this information can be sign language interpreters who are employed at events or who are shown during television programmes (Prillwitz 2001; see also Mälzer/Wünsche, Heerdegen and Witzel in this volume) or information on websites presented in sign language videos (BMGS & Gebärdenwerk 2004). Nevertheless, written language still plays an important role in the everyday life of people with a hearing disability. A survey conducted by Bosse and Hasebrink (2016: 77) found out that the Internet as a partly written source of information has an important meaning for this target group: around 90% of deaf people and around 60% of people who are hard of hearing use the Internet several times a week. Furthermore, the traditional daily newspaper remains an important, entirely written source of information: 71% of deaf people and 89% of people who are hard of hearing rely on newspapers on a regular base. It has been repeatedly proven that deaf adults have lower literacy skills than average persons (Krammer 2001). Since a great deal of information is only available to them in a written form, affected individuals can be considered to be significantly impaired in their social participation. High literacy skills are one of the most important resources for deaf people and people who are hard of hearing in order to achieve professional success: In a retrospective survey with 32 professionally successful, deaf people and people who are hard of hearing,

Hintermair et al. (2017: 120 ff.) found that all of these people underlined the importance of literacy skills for their careers even though it was not the main focus of the survey. The relevance of written language for working life is rated as even more important than for apprenticeships, studying or schooling (Hintermair et al. 2017: 124).

Especially if deaf adults with sign language skills create written texts, these texts may sound unusual to outsiders. The writers may be able to express correlations in their primary language DGS, but do not necessarily always know the matching equivalent in their secondary language German. Therefore, deaf people are often similar to other people who learn German as their secondary language by making mistakes like omitting function words and using wrong allocation of genus (Krausmann 1998: 585) or omitting the linking word "sein" ("to be") (Plaza-Pust 2016: 410). But there are also differences to hearing learners who had already acquired another phonetic language before they started learning German as their secondary language. Sign languages have a spatial grammar that produces numerous linguistic units simultaneously. If these units are transferred to a linear written language, morphosyntactic structural elements in particular can be missing. But precisely this information is needed for the readership of a German text to create all references within a sentence. If there is a sign with the same meaning but another viseme, other lexemes can be used that are not necessarily required. Krausmann (1998: 586 ff.) lists typical mistakes that can appear in texts written by deaf people (also by deaf people with sign language skills). Examples of these mistakes are: coincidence of noun and verb ("Afterwards, we ate cake and coffee drinking"), omitting previously named subjects or objects ("And afterwards, also spoke about the loyalty bonus", the previously mentioned "president" is meant here), omitting information about role-adoption which, in sign language, is shown through body expressions or head position ("Besides, he needs at least 4 to 5 days to edit the subtitles of a 1 1/2 hour long film. That is exhausting. Is it possible to get more programmes for the deaf as well as subtitles?") and omitting phonetically necessary additions for congruency verbs (like the German BESCHEID-GEBEN (Engl.: LET KNOW)) that in sign language are expressed with the directions of the movements ("then let me this Friday or next week"). There is no comprehensive and systematic description of linguistic mistakes in

texts produced by deaf users of sign language. This makes it hard for hearing communication partners without sign language skills to interpret all messages correctly. With knowledge of DGS, a text that apparently cannot be understood in its entirety can partly be decoded with more ease as respective spaces can be filled with the help of sign language skills.

6 Consequences for educational, therapeutic and social work

In summary, deaf adults and adults who are hard of hearing can be considered individuals who do not have access to all the information if they use written communication and who cannot express themselves completely in writing. Like other people who are in the same position, they are often considered cognitively and linguistically unable to understand complex facts. Therefore, it is initially important to be aware of the fact that people with a hearing disability are disadvantaged when learning and using written language due to a multitude of different reasons. It does not mean that their lack of these skills correlates with other skills (such as cognitive, linguistic, social or work-related skills).

To enable effective communication with a deaf or hard-of-hearing adult, direct communication is better suited in most cases than indirect written communication. In this respect, it is important to consider the preferences of the particular person with a hearing disability, for example whether they communicate phonetically or through sign language or whether they perhaps use another additional technique, e.g. electronic transmission equipment. Communication with a person who uses sign language can be ensured by a sign language interpreter, who needs to be appointed in time through a regional sign language interpreting agency. The interpreter's pay should also be ensured in consultation with the affected people. People with a hearing impairment who primarily communicate through spoken language need good visual conditions to see the conversation partner's viseme (good lighting, no backlight and eye contact during communication), a room without disturbing noises, a language that is clear but not too fast and not too loud, clear gestures and perhaps additional written information. Regardless of the form of communication, hearing

conversation partners should make sure that all the relevant information has been understood.

In exclusively written communication, complex written language should be avoided without omitting content-related messages. In the field of education for the hearing impaired, the concept of text optimisation was developed. Its rules can help to rewrite difficult texts into more comprehensible texts (Wagner/Schlenker-Schulte 2009).

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Saskia Schuppener and Bettina M. Bock

Intellectual disability and accessible communication

1 Approaching the group of people with so-called intellectual disabilities

To approach people in the form of a definition is always to view them from the outside. This is especially true of a definitional approach to the question of the criteria of so-called "intellectual disabilities". Inherently, such tentative definitions are marked as attempts of external ascriptions: "There are people who *we* associate with a certain group of people on the basis of *our* perception of their human activities and how *we* see them reflected in social standards. We describe this group of people as 'intellectually disabled'" (Feuser 1996: 18; emphasis in original; English translation of the German original).

"To this day, there is no universally recognized definition of what a disability is, although the term has been part of the general and scientific language for decades" (Dederich 2009: 15; English translation of the German original). What we as a society label as a "disability" is

> on the one hand a term that is up for interpretation and on the other hand a status that people gain or which is assigned to them. The matter revolves around the difference between a subjective and an objective construction of the meaning of disability. Both bear problems as there is no universal characteristic determining whether or not a person is 'disabled'. Therefore, an individual subjective construction of disability can become an objective disability – but does not necessarily have to (Trescher 2014: n.pag.; English translation of the German original).

In the context of a "social model of disability", disability is always understood as a negative form of deviation from the social standard (ibid.) and "in this

sense, and depending on the point of view and context, is the result of a process of perception and interpretation given a person's contradictory traits or characteristics" (Dederich 2009: 37; English translation of the German original).

People who are specifically addressed as *intellectually disabled* often depend strongly on support and in many cases on the interpretation of their individual forms of expression which in turn should be made on the basis of intersubjectivity and social interdependence. One should be aware that people who face the diagnosis of being "intellectually disabled" in their life have a higher risk of being perceived as someone in the "grip of deficiencies" (Haupt 1998: 100) since definitions of an "intellectual disability" are to some extent marked as a compilation of characteristics of deficiencies and impairments in almost all areas of development. In 1876, Feuser already suggested a definition that still holds significance for current discourse based on an ableist approach:

> We can say that someone is considered intellectually disabled if they are restricted in their receptive and processing capacities due to organic, genetic or other damages, especially due to impairments resulting from socio-economic disadvantages and social isolation which becomes particularly apparent in the context of perception, thinking and acting as well as sensorimotor functions. These restrictions mean that they will likely need lifelong pedagogical and social assistance in order to meet their special educational needs due to their learning abilities (Feuser 1976: 643 f.; English translation of the German original).

Ableism describes ideas, beliefs and practices that start from a "non-disabled ideal" and describe disability on the basis of capability-oriented individual practices (see Buchner/Pfahl/Traue 2015) as a "reduced state of personhood" (Campbell 2008 in Maskos 2015). "Coming from the field of *disability studies*, the concept of *ableism* radically questions the assumed normality of an individualised attribution of abilities and thus offers important analytical and critical possibilities of debates on inclusion" (Meißner 2015: n.pag.; English translation of the German original).

In educational contexts, children and adolescents with the diagnostical background of an intellectual disability are faced with the label of *so-called special educational needs due to intellectual and developmental disabilities (Förderschwerpunkt geistige Entwicklung)*. This includes students with so-called severe or multiple disabilities (see e.g. Dworschak/Kannewischer/Ratz/Wagner 2012). Especially impairments connected to *communication* are marked by this support priority since "an impaired intellectual development" generally has an impact on "the receptive, processing and representative capacities of communication" (KMK 1998: n.pag.; English translation of the German original).

Since its inception, the reduction to a diagnostic label (= "intellectual disability") has been discussed controversially because of its stigmatising effects (see Bock 2015). Therefore, the German network of self-advocates "Mensch zuerst – Netzwerk People First Deutschland e.V." distances itself from this term and its related ascriptions and instead favours the term *"people with learning difficulties"* as a self-description: "People with learning difficulties are sometimes called intellectually disabled. We do not want that. Thinking and cognition are not the same. That is why we call ourselves people with learning difficulties" (Mensch zuerst 2018; English translation of the German original).

2 Participation

In the context of social economic pressure and a "raw bourgeoisie" (Benkmann 2014; English translation of the German original) as the current stance in our society, the question of *participation* of people in marginalised circumstances is equally important as it is challenging. "Participation is often used synonymously with involvement" (Prosetzky 2009: 88; English translation of the German original) and its meaning is often seen as positively and morally heightened (ibid.; see also Niehr 2018) since participation is a central demand in the field of disability pedagogy. With regard to people who are addressed as disabled, participation is not only defined as "active involvement in a social system", but also as a "right to have a say and concrete opportunities to contribute" (Schwalb/Theunissen 2018: 9; English translation of the German

original). Additionally, a basal form of involvement for people with complex disabilities should be taken into account (see Schuppener 2016).

The discourse around participation always includes social demands, justice, partisan stance and institutionalisation (see Bärmig 2015). This needs to be considered and reflected upon when discussing pragmatic realisations of participation. Especially institutionalisation is of particular interest to people with an assigned intellectual disability: Even in the age of post-deinstitutionalisation (see Kremsner/Proyer 2016) the daily lives of children, adolescents and adults labelled as "intellectually disabled" predominantly take place in institutions. Even structures of "total institutions" (Goffman 1993; English translation of the German original) are still commonly found. Institutions that offer services and support for people with disabilities are places in which hierarchies and power structures are produced and reproduced. In reference to Gramsci, Kremsner and Proyer (2016; English translation of the German original) call them "hegemonic apparatus" as they are inevitably associated with a high loss of autonomy. People living there are subjected to rules that entail unfreedom and oppression. For example, if Dworschak/Schmidt (2011) call participation a human right which refers to the "availability of accessibility of, the integration in and the development of one's own existence in areas of life" (Dworschak/Schmidt 2011: 276; English translation of the German original), then the question is whether this demand is even redeemable for people living in institutionalised structures. With reference to Petersen (2007), Prosetzky (2009) says that participation can only be achieved if power structures are reflected upon and changed. Since institutions that offer services and support for people with disabilities see themselves as places that "encourage autonomy" and emphasize the claim of "relationship oriented work", but cannot answer the question of whether this bears a certain level of paradox, the change of the "polarization between a pole of power and a pole of powerlessness" (Jantzen 2005: 206; English translation of the German original) remains challenging: In regard to the autonomy-encouraging institutional self-conception, Jantzen also speaks of the "*front stage* of the institution" while the "*backstage* simultaneously maintains oppression" (ibid.: 207; emphasis in original; English translation of the German original). Participation-oriented changes can only take place through respect, acknowledgment, trust and acceptance

that is expressed in a communicative encounter. The starting point of such a dialogue is the reflection on power structures as part of a (communicative) cooperation: This starts, "as every form of freedom starts, with saying 'no' to power: in this case to one's own power" (ibid. 221; English translation of the German original) and by meeting one's counterpart with empathy, accepting their boundaries and trying to understand them in the light of their biographic experiences. Only this can ensure participation: communication with "friendly companions" (see Prosetzky 2009 with reference to Jantzen 2005). Therefore, unconditional communication is of elementary importance when it comes to the question of the participation of people who are perceived as intellectually disabled and depend in a very first step on partisan stance and empathy. In a next step, the practice structures cannot be characterized by "adherence to power structures", since this "acting against better knowledge [is to be evaluated] either as immoral, unreasonable or senseless" (ibid.: 94; English translation of the German original) and represents a central barrier in the realisation of participation.

According to the explanations above, a multidimensional understanding of participation shall be assumed which is based on the rights of persons with disabilities (cf. Biewer 2017) and also includes the institutionalised living conditions that are still common. Accordingly, participation is on the one hand "the participation in and the identification with certain institutions, values and socially relevant powers of a society" and on the other hand a "committed participation in democratic structures and processes that manifests itself in practical political work" (Hillmann 2007: 667; English translation of the German original). This claim "does not agree with the traditional form of work with the disabled that was and sometimes still is marked by defect- and deficiency-oriented thinking and action in which people with disabilities are seen as deficient beings who need care, treatment and instructions" (Schwalb/Theunissen 2018: 9; English translation of the German original). In the context of different (institutionally and structurally shaped) basic attitudes, "sham participation" in which people with so-called intellectual disabilities can only act within given concepts and institutional structures, but outside which they are not able to act, must be avoided in particular (see Schwab 2016).

3 Linguistic competence and literacy

Linguistic competence and particularly reading and writing skills are undoubtedly an important prerequisite for participation in society (see Dönges/Stegkemper/Wagner 2018; Tschernig/Vo Thi 2017; Bock 2018a). If there is a mismatch between individual dispositions for action and everyday reality, participation opportunities become restricted (Dönges/Stegkemper/Wagner 2018).

General descriptions of linguistic competence in the population with intellectual disabilities often provide only vague indications: general developmental delays and special development trajectories in language acquisiton are described. Among children, adolescents and adults with intellectual disabilities, "one has to anticipate – regardless of age – all possible levels of linguistic competence, which is a huge challenge" (Aktas 2012: 47; English translation of the German original). In general, developmental language disorders in all areas (phonology, vocabulary, morphology, syntax, pragmatics) occur significantly more often in children with a diagnosis in the area of an intellectual disability (see Wagner/Kannewischer 2012: 103). Overall, however, there are no comprehensive empirical findings on linguistic competence and literacy of the *entire* group of people who are considered to be intellectually disabled. The existing empirical studies are mostly limited to subgroups that can supposedly be relatively well defined. They focus in particular on so-called genetic syndromes (especially Down syndrome, Williams syndrome, etc. or also autism spectrum disorders).

In the following, some aspects of linguistic competence and reading and writing skills will be examined in more detail. The focus will be mainly on empirical studies that will be presented and discussed especially with regard to unanswered questions.

3.1 Linguistic and communicative competence

The linguistic and communicative competence of people with intellectual disabilities differ immensely. They range from limited contextual non-linguistic communication abilities to "almost normal language use" (Wilken 2009: 114; English translation of the German original). Diagnosed impair-

ments of cognitive skills often manifest in the form of altered perceptions and altered processing of stimuli and information. This also has a more or less strong impact on communicative competence and language acquisition. Language acquisition in children with a diagnosed intellectual disability is almost always more or less delayed whereas the language retardation is often not at the same level as other developments (ibid.). All areas of linguistic competence are described as potentially affected by impairments: restrictions of productive and receptive vocabulary, difficulties in the areas of grammar and pragmatics. However, communication weaknesses in one area can be compensated by strengths in another. Thus, people with Down syndrome for example often have "pragmatic skills which in connection with often highly developed social skills result in a relatively high communicative ability despite restricted language" (Wilken 2000: 162; English translation of the German original). The level of social skills in this group of people is often above the level of intelligence that notably facilitates active engagement and learning within inclusive structures (Schuppener 2008: 99).

Many people with an ascribed intellectual disability have further impairments such as auditory and visual impairments as well as perceptual impairments in visual, auditory, tactile or kinaesthetic areas. Therefore, this calls for different forms of communication support and accessible communication (see e.g. Musenberg in this volume; Kahlisch/Dobroschke in this volume). The scope of language proficiency and cognitive impairments are not directly related even if diagnoses in the spectrum of so-called complex disabilities (see Fornefeld 2008) often entail an accordingly high level of communication support. However, there can be major differences between receptive and productive language skills: Frequently, the language comprehension skills "are considerably more advanced than the verbal [i.e. productive oral language, S.Sch./B.B] skills suggest" (Wilken 2009: 144; English translation of the German original; see also Schuppener 2008: 99). As a result, the cognitive abilities as a whole are often underestimated. The discrepancy between language comprehension and the ability to express oneself and the resulting misjudgement of the actual skills often lead to communication situations in which the people concerned are either challenged too much or not challenged enough (Wilken 2009: 120). Generally, we cannot assume a simple analogy

between the levels of social, language and cognitive abilities: In comparison with their social and linguistic skills, the level of thinking of people with intellectual disability are "almost regularly underestimated" (Schuppener 2008: 98; English translation of the German original).

So far there is a lack of empirical studies that describe in detail the language skills and difficulties, especially of adults with so-called intellectual disabilities (see Chapter 4 for a grammar study). In Germany, the only comprehensive study ever conducted documented the language skills of pupils in Bavaria in the area of special educational needs in intellectual and developmental disabilities. The results were collected from questionnaire-based assessments by the teaching staff. A total of 1629 children and adolescents who were taught at special-needs schools in Bavaria were included (Dworschak/Kannewischer/Ratz/Wagner 2012). One of the areas discussed included linguistic competence (Wagner/Kannewischer 2012: 105 ff.). The results show that in the area of oral language almost 27% of pupils use complex sentences and more than one third speaks in multi-word sentences. Another 19.5% of pupils only use one- or two-word sentences and a little more than 19% do not use spoken language at all. Regarding receptive language the teaching staff answered that almost 49% of pupils understand single words, simple sentences and instructions, a little over 41% of pupils also understand complex sentences and instructions (for the remaining 9.9% of pupils the teaching staff could not assess their language comprehension skills). Language and speech impairments are present in 68.2% of pupils according to the teaching staff (ibid.: 108) which is significantly higher than in the prevalence of the general population. The study also asked which communication types and aids are relevant: According to the teachers 16.3% of pupils communicate via signing, almost 32% communicate with the help of images and almost 26% use symbols.

In addition, there are a number of empirical studies from English-speaking countries, although these mostly relate to individual subgroups. However, there are still research gaps (see Abbeduto/Warren/Conners 2007: 257 f.), especially in the areas of (general and syndrome-specific) precursory skills and non-verbal factors influencing language acquisition (like phonological short-term memory or auditory acuity), relations between social skills (social cognition) and acquisition of vocabulary as well as pragmatic skills (see also

Hatton 1998; Abbeduto/Hesketh 1997). There is a lack of longitudinal studies and particularly studies concerning the linguistic and communicative skills of adolescents and adults diagnosed within the spectrum of so-called intellectual disabilities (see Abbeduto/Warren/Conners 2007: 257). As a consequence of the research situation, findings related to effective interventions and support measures are also still needed (ibid.: 258).

3.2 Reading and writing

For a long time, the focus in schools for special educational needs due to intellectual and developmental disabilities was on learning practical skills in order to enable independent living in everyday and professional life ("*praktische Bildbarkeit*"). Acquiring literacy skills played no or only a subordinate role. In Germany, the "educational aim of written language as a central cultural technique […] in special educational needs in intellectual and developmental disabilities" (Ratz 2012: 111; English translation of the German original) is considered uncontested today. The same applies to English-speaking countries, though there are complaints that in practice the acquisition of literacy skills plays only a minor role:

> Despite the importance of literacy in today's society, surprisingly little attention has been given in schools to teaching reading to individuals with DS [Down syndrome; S.S./B.B.], perhaps because of the assumption that their limited language skills will make learning to read impossible. Nevertheless, many individuals with DS do acquire basic literacy skills, although they may do so by a different route than their typically developing peers. There is a need for more research on the strategies used by individuals with DS as they struggle with print (Abbeduto/Warren/Conners 2007: 258)

The authors assume that one of the reasons is that the achievable competences of the children are underestimated. This is also indicated in empirical studies in this field (see below). Another reason why children who have been diagnosed with special educational needs due to intellectual and developmental disabilities are not sufficiently confronted with written material may be that,

due to the patchy research situation, little is known about target-group-based, effective learning methods for reading and writing. Research on methods of literacy acquisition, the reading process, adequate support and the distribution of reading and writing skills among people who are considered to be intellectually disabled, can still be significantly expanded.

As is the case with the linguistic-communicative competence, research desiderata are therefore still outstanding in this area. Overall, the focus is more on the early stages of literacy acquisition and lower levels of processes as well as precursor skills to reading, while research on *textual* competences in people with assigned intellectual disabilities is only marginally covered at best. Existing studies on reading competences often aim at quantitatively measurable sub-skills, i.e. mainly the hierarchically lower processing levels are recorded. More elaborate qualitative studies, which would cover higher levels of processes such as reading comprehension and pragmatic sub-skills, are still rare here.

German-language research includes empirical studies on phonological awareness and recoding: Koch (2008) investigated which subskills in the field of phonological awareness are actually relevant for children with Down syndrome in learning to read. Kuhl, Euker and Ennemoser (2015) have examined the effect of syllable-based recoding training on phonemic reading. The only empirical study from the German-speaking area that examined the reading and writing skills of the entire group of people in its heterogeneity is the same study that was already cited above, which refers to the student body with special educational needs due to intellectual and developmental disabilities in Bavaria (Ratz 2012). Information on literacy skills were also collected in the questionnaire-based assessments of the teachers. In this way, the reading and writing skills of students with special educational needs due to intellectual and developmental disabilities between the ages of 6 and 21 at three school levels (primary, secondary and vocational school level) were documented. The categories in the teacher questionnaire are related to the literacy development stages according to Valtin. The study found that according to the teachers' assessments, 12% of the students in the 10th–12th school year (at vocational school level) read very fluently, 21.1% read at an "advanced" level, but 33% (still) did not read at all (see Ratz 2012: 122). The proportion of those who do not read at all is about the same at all school levels. This proportion roughly

corresponds to the proportion of students with complex disabilities (ibid.: 118). Overall, with regard to the development of abilities over the course of education, it "is very clear that students can read better the longer they are in school" (ibid.: 119; English translation of the German original). For writing, the results are similar: At the vocational school level, 18.5% of the students use phonetic spelling, 17.3% use orthographic patterns and only 4%, according to the teachers, have good orthographic knowledge. A relatively large proportion of 31.1% does not yet write at all or only "scribbles".

In summary, it should be noted that the literacy skills are very diverse (ibid.: 127). Reading is always ahead of writing in ability development. In addition, reading

> among the students with special educational needs due to intellectual and developmental disabilities […] is much more developed than writing. This result raises questions about the underlying development model of literacy learning, which assumes a parallel development in which developments in reading and writing support each other (ibid.: 128; English translation of the German original).

Reading comprehension was not recorded in the study, but the questionnaire contained at least one question that required a rough assessment of the reading process: The assessment focused on whether mechanical reading or reading for meaning had taken place. Overall, the teachers estimated that on average, more than half of the students read for meaning, and that this proportion increases with age (ibid.: 123). However, it remains unclear which concepts of 'reading for meaning' the teachers use here and on what their assessments are based. If one compares the results of the study with empirical data from regular primary school, it turns out that students generally learn to read and write more slowly than primary school children in regular schools (ibid.: 129).

Studies that directly record reading competences and, in particular, reading comprehension and address textual literacy and reading strategies are scarce in the German research landscape. There are currently two qualitative studies on reading competences in adults with attributed intellectual disabilty: Within the framework of the LeiSA project (http://research.uni-leipzig.de/leisa/de/), a

qualitative study was carried out that covered the reading comprehension and textual competences of adults with so-called intellectual disabilities (see Bock/Lange 2017, see Chapter 4). In addition, Wilke (2016) empirically investigated in a grounded theory study the importance of literacy skills in the lives of adults with diagnosed intellectual disabilities and studied in which everyday context their reading and writing activities are embedded. In this study, Wilke comes to the conclusion that 32% of residents in residential care facilities are able to read. At the same time, however, she indicates the limited validity of such a value: "This is a non-negligible third, but most of the residents do not have this competence. At the same time, the skill itself does not mean it is actually used or that active reading takes place" (Wilke 2016: 261; English translation of the German original).

The LeiSA study focused on reading comprehension skills: The participant group consisted of 30 adults with so-called intellectual disabilities who were employed in sheltered workshops for people with disabilities or in external or integrational workplaces (a second participant group consisted of 20 functional illiterates or people with reading difficulties) (see Bock/Lange 2017). One of the sampling criteria was the broadest possible spectrum of reading competences in the participant group. The reading comprehension was tested with the lea.-diagnostics (Grotlüschen 2010). This diagnostic tool helps in particular to record the low levels of competence in adolescent and adult readers in a differentiated manner. The test covers five reading levels: Readers at literacy level 2 are able to read words constructively; readers at literacy level 3 read words and sentences predominantly constructively, but can already read standard words lexically. At literacy level 4, the constructive and lexical reading of short texts (approx. 2 sentences) is possible and at literacy level 5, longer texts (5–8 sentences) can also be understood. Literacy level 6 refers to unimpaired reading comprehension skills. Beginning with literacy level 4, the authors of the lea. study locate functional reading skills, reading skills at reading level 3 or less point to significantly impaired reading comprehension skills or functional illiteracy.

Reading skills in the LeiSA study group were distributed as follows:

reading level 2	reading level 3	reading level 4	reading levels 5 and 6
16.7%	30%	46.6%	6.7%

Table 1: Distribution of reading skills among participants with intellectual disability (N = 30, one participant could not clearly be assigned to reading level 2 or 3 and was counted in level 2 here)

Since it is a qualitative sample, no conclusions can be drawn about the overall population. It is remarkable, however, that reading comprehension skills among those who are able to read often reached a high level. For instance, in the acquisition process 16 study participants with a diagnosed intellectual disability who are able to read at high to almost unimpaired reading levels could be recruited without a major effort (literacy levels 4–5 following lea-diagnostics, see Grotlüschen 2010). The difficulties in reading comprehension were very different at all levels; even at the lowest reading level, the study participants partly exhibited reading strategies that could compensate for recoding and understanding difficulties which enabled them to grasp the meaning of texts (see Bock/Lange 2017).

In the English-speaking research landscape, there are initial studies that have examined reading competences and intervention measures by means of standardised and qualitative methods; participant groups are mostly children diagnosed with a cognitive disability. Here, too, significant research desiderata are still outstanding (on children with Down syndrome: Abbeduto/Warren/Conners 2007: 255 f.). An American longitudinal intervention study has taken into account the reading process of primary school children with an IQ between 40 and 69 (Allor et al. 2010). The intervention considered a wide range of reading parameters. Quantifiable reading parameters, e.g. in the areas of phonological awareness, vocalisation and word recognition, as well as reading comprehension strategies for different types of text were collected. The intervention triggered significant progress in the individual parameters, but was not equally effective in all areas. In reading comprehension, for example, no significant effects were identified (ibid.: 460). In addition, the interindividual differences were very large: The intervention was not equally effective for all students (ibid.: 464). However, one of the main findings is that students with a diagnosed intellectual disability, regardless of IQ, can benefit from interventions to promote reading after two to three years (ibid.: 456). Basically, "performance [in reading; S.Sch./B.B.] does not appear to be clearly predicted by IQ score" (ibid.: 463; English

translation of the German original). This suggests a need for the development of adequate, long-term programmes to promote reading, which requires, as a first step, closer investigation of the reading process and how reading is learned among students with special educational needs due to intellectual and developmental disabilities. However, the study not only identified research gaps, but also highlights that potential reading competences among children (and adults) with the label intellectual disability may be higher with adequate techniques for instruction and support instruments than is currently the case (see ibid.: 463).

4 Comprehensibility and appropriateness of Easy Language for people with intellectual disabilities

The type of accessible communication that is currently probably receiving the most public attention and is sometimes discussed controversially in Germany, is so-called Easy Language (see Bredel/Maaß in this volume). Since an empirical foundation of Easy Language – particularly in relation to people with so-called intellectual disabilities – is repeatedly being called for (see Bredel/Maaß 2016: 143; Christmann 2017: 46), the following section will highlight current empirical studies that focus on this group of people.

Easy Language emerged primarily intuitively in the context of the so-called disability movements and was primarily addressed to people who bear the label of intellectual disability. It is primarily a written form of communication and starts at text level. In this respect, it addresses people who have at least basic reading skills and reading strategies in order to acquire texts independently. Visual impairments and motor impairments are taken into account to a certain extent by adjusting font size, macro-typography, format and material of the text medium to the needs of the addressees. For digital texts, there are further technical possibilities to reduce reception barriers. On websites in Easy Language, often a read-out-loud function is offered which initiates a medial change: The written texts become offers of oral communication.

At the moment, only a few empirical studies on the comprehensibility of the features of Easy Language with the aforementioned heterogeneous target

group are available. At this point we would like to pick out two characteristic aspects: *grammar* and *text level*. The following sections are based on the presentation in Bock (2018b).

4.1 Grammar/Syntax

In the rule book of the Netzwerk Leichte Sprache (a self-advocate organisation that promotes and supports German Easy Language), the level of grammar occupies a comparatively large space. Only a few references can be found in the "sentences" section, which – partly implicitly – are aimed at the complexity of sentences and structure of information. However, further grammatical phenomena are classified in the chapter "words". Some of the rules:

- "Use active words." (Netzwerk Leichte Sprache 2013: 9; English translation of the German original)
- "Avoid the genitive." (ibid.: 10)
- "Use positive language." (ibid.: 11)
- "Write short sentences. Make only one statement in each sentence." (ibid.: 18)
- "Use a simple sentence structure" (ibid.)

Initially, these assumptions seem imminently plausible. From a perspective of language acquisition and when looking into empirical research on reading comprehension and language processing, however, it already becomes necessary to differentiate (see Bredel/Maaß 2016). Lasch for example mentions that it is necessary to differentiate between statal and processual passive in terms of difficulty: The German *sein*-passive is acquired by children very early on, suggesting that it generally causes few comprehension problems and therefore does not have to be avoided (Lasch 2017: 295 f.). First explorative studies on grammatical phenomena are available on Easy Language and its target groups. Düver (2015) investigated how individuals with cognitive impairments assess sentences of varying difficulty. The study dealt, among other things, with statal and processual passive. The sentence difficulty was additionally increased by embedding the passive constructions in conditional sentences and by adding negations (Lasch 2017: 294). The participants were able to "understand and

evaluate not only (negated) conditional and causal sentences, but also embedded passive structures" (ibid.: 296; English translation of the German original). Although the comprehensibility of sentences in this study was recorded as an evaluation of perceived difficulty on the recipient's side, the findings are consistent with other studies in which understanding of the sentence was directly recorded: In the context of the LeiSA study, the test for the reception of grammar TROG-D (Fox 2006) assessed how well individuals with attributed intellectual disabilities can understand sentences in passive voice, negation with *nicht* ('not') and *weder noch* ('neither nor'), types of subordinate clauses, especially relative clauses, and other grammatical phenomena. The participant group consisted of adults with a diagnosed intellectual disability and was already described above (Section 3.2). The participants had to read four sentences for each phenomenon and assign a picture that fits the meaning of the sentence. Subsequently, the error rates were evaluated. Statistical clustering results in the following difficulty gradings according to error rates:

Average error rates	**Phenomena in sentences of the TROG-D**
unproblematic (5.9%)	Negation with *nicht* ('not'); 2-element sentences; 3-element sentences, prepositions *in*, *auf* ('in', 'on')
somewhat problematic (12.5%)	Subjunctions *während, nachdem* ('while', 'after'); relative clauses; plural; prepositions *unter*, *über* ('under', 'above'); personal pronouns (nominative, accusative/dative)
moderately problematic (37.5%)	Passive voice; perfect tense; negation with *weder – noch* ('neither – nor'); constructions with two objects; coordination with *und* ('and') (+ ellipsis) (e.g. *Der Schuh ist auf dem Stift und ist blau.* ('The shoe is on the pen and is blue'))
very problematic (47.3%)	Topicalisation; subjunction *dass* ('that') (e.g. *Der Junge sieht, dass die Frau sich sieht* ('The boy sees that the woman sees herself'))
extremely problematic (75.9%)	Object relative clauses (relative articles in dative/accusative)

Table 2: Overview of error rates in the test on grammar reception (TROG-D)

In short, negations with *nicht* ('not'), shorter subordinate clauses with the conjunctions *während* ('while') and *nachdem* ('after') as well as relative clauses with relative pronouns in the nominative proved to be only somewhat problematic to not problematic at all (see Bock/Lange 2017, Bock 2017; for negation in the case of people with hearing impairments see Bredel/Lang/Maaß 2016). In sentences with German *werden*-passive, the study participants made a moderate number of mistakes (see Bock 2017). Most difficulties were caused by object relative clauses with a relative pronoun in the dative or accusative (e.g. *Das Buch, auf dem der Stift ist, ist rot.* ('The book, on which the pen is, is red.')) (see Bock/Lange 2017). Sentence complexity is thus undoubtedly a potential comprehension obstacle, but the requirement to avoid subordinate clauses in general cannot be deduced, as Lasch also concludes from his findings. The findings for the prohibition of the genitive are even more obvious: Lange studied the comprehension of sentences with genitive case and *von*-paraphrases in comparative research with adults with so-called intellectual disabilities and has not been able to prove any significant difficulties in understanding the genitive or an advantage of the alternative *von*-structures (Lange 2019).

Including different types of passive, negation or subordinate clauses and the context of the text, results in a need to differentiate the rules of Netzwerk Leichte Sprache. This is also consistent with studies on text optimisation from another area: Balling (2018) investigated to what extent the replacement of problematic constructions such as passive, nominalisation etc. in texts improves text comprehension of university students. She could not prove any positive effect of the replacements which she explains by i.a., the fact that the phenomena in the investigation were manipulated in isolation. In order to positively influence text comprehension, it would be necessary to include aspects of coherence or information structure, which for example are important in the understanding of passive structures (Balling 2018: 117 f.). This shows how complex the implementation is, also in Easy Language, even in seemingly well-demarcated grammatical phenomena.

4.2 Knowledge on the part of the reader: Text types

The knowledge of the addressees is relevant to reading comprehension at practically every linguistic level. As an example, the text level, namely the

knowledge about text types, will now be taken into consideration. Overall, the catalogue of rules of the Netzwerk Leichte Sprache provides few indications at this linguistic level. The indications, which are implicitly or explicitly included, usually remain general or concern aspects that are not central issues when it comes to text comprehension:

- "Address the readers personally." (Netzwerk Leichte Sprache 2013: 20; English translation of the German original)
- "Keep everything together that belongs together" (referring to the avoidance of references) (ibid.: 21)
- "You are allowed to change a text when writing in 'Easy Language'." (ibid.: 22)
- "Include many paragraphs and headings." (ibid.: 28)
- "Always use the same words for the same things." (ibid.: 6)

The aspect of the text type has so far received too little attention. Scientists are currently discussing which abilities to distinguish text types can be assumed among the target groups (see Bredel/Maaß 2016: 195 f.). Empirical studies have shown that addressees of Easy Language partly have distinctly differentiated and comprehensive knowledge of text types, sometimes, in fact, even at very low levels of reading literacy: Not only do they have a concept of text types and the fact that they fulfil different functions, they also recognize types of texts by typical visual characteristics and have (sometimes rather idiosyncratic) designations for text types. In some cases, even characteristic features of text types can be named independently, which proves a *high degree of linguistic reflection and linguistic awareness* (Bock/Lange 2017). The knowledge of text patterns, as with all language users, depends significantly on the individual communicative experience.

The present empirical findings on Easy Language thus suggest something similar as does some of the research on the reading skills of people with an intellectual disability: On the one hand, there is a risk that competences are underestimated or misjudged. On the other hand, it becomes clear how complex the task of text adaptation is. Both provide a reason for further crit-

ical examination in theory, research and practice with the development and adaptability of Easy Language.

5 Easy Language and its participative meaning

Regarding the meaning of Easy Language with a view to accessibility, different paradoxes can be identified. Although the concept of "Easy Language" claims to "make texts of all communication areas accessible to the target recipients and therefore improve the opportunities for participation" (Schuppener/Goldbach/Bock 2018: 361; English translation of the German original), it is currently also being discussed that risks of discreditation exist at the same time: The use of Easy Language is also always accompanied by "an attribution that the counterpart be dependent on 'Easy Language' and therefore assumes a deficit" (Seitz 2014: n.pag., see also Zustrassen 2017: 61; English translation of the German original).

Due to the development culture of the concept of Easy Language – focusing on the target groups that are described as being intellectually disabled – this form of written language rather states an intensification of ableist constructions than a contribution to the deconstruction of disability. It clearly shows the phenomenon that some of the potential users do not use this language variety because they feel stigmatised due to excessive simplification (see Bergelt/Goldbach/Seidel 2016).

According to the results of the LeiSA study, there is a risk that the preparation and provision of information written in Easy Language constitutes a kind of tokenism (Schuppener/Goldbach/Bock 2018) caused by institutions proving that they respect this characteristic of accessibility. However, this is not accompanied by an actual added value regarding the independence and self-determination of the users (see Bergelt/Goldbach/Leonhardt/Seidel 2018).

The question arises to what extent the concept of Easy Language that is currently orientated on a consistent set of rules can satisfy the claim for individualisation and differentiation in any form. Exactly this claim should have a central meaning when focusing on the right of participation for people that are called intellectually disabled. However, this seems difficult to solve by dog-

matically following rules regarding the development and testing of texts in Easy Language given the heterogeneity of the group of recipients – especially in the areas of communication competences and need for support. Comprehensibility research also strongly questions whether texts in Easy Language, designed in their existing form, are able to present target group oriented solutions that make any contribution to accessibility. Against the background of a very inconsistent practice, a universal validity claim of a set of regulations must be questioned:

> Different situations of communication demand different linguistic (and typographic) means. Unlike other countries, for example the Scandinavian countries, this has not been considered yet. It even has been dogmatically excluded. To allow the recipients participation in communication, a flexibilisation of the realisation of Easy Language is urgently necessary (Schuppener/Goldbach/Bock 2018: 366; English translation of the German original).

Parallel to the expansion of the reading and writing concept, Easy Language is responsible for creating an awareness in the discourse of accessibility in communication (in written language). This marks an additional claim in reflection regarding the diversity in the field of basic requirements of communication – related to fundamental claims on different written levels in text design. Still, the question remains whether and in what (design) form the existing practice of Easy Language represents an actual contribution to the participation of people with learning difficulties or if it partly excludes these people even more since the target group orientation contributes to the production and reproduction of (intellectual) disability. The concept's "function to promote sensitivity to inclusion and diversity" is therefore somewhat questionable (see also Zurstrassen 2017).

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Forms of accessible communication

Ursula Bredel and Christiane Maaß

Easy Language

For people with reading disabilities, general, technical or expert texts written in standard language contain barriers of different kinds that can severely impede reception, comprehension and retention or even make texts entirely inaccessible (see the articles by Rink and Christmann/Groeben in this volume). Christmann/Groeben as well as Lutz (both in this volume) describe which characteristics of texts complicate their comprehensibility and which, respectively, facilitate perception and understanding.

Reading disabilities can have different causes and present in different manifestations depending on their type and intensity (see an overview in Bredel/Maaß 2016a and 2016b). The question of whether Easy Language, as a variety of German with maximally enhanced comprehensibility, represents a suitable solution for all people with reading disabilities, needs to be answered empirically. The requirements for such an empirical examination are an understanding of the construct of Easy Language as well as its position in society. This article focuses on the genesis, the current legal situation and scientific approaches as well as the question of the societal relevance and acceptance of Easy Language.

1 Easy Language: Origin in empowerment and a first set of rules

Easy Language is a variety of the German language that, in contrast to fully developed standard German, exhibits increased perceptibility and comprehensibility for people with reading disabilities. It was developed by participants of the disability rights movements and the empowerment movements (Tjarks-Sobhani 2012, Maaß 2015) and especially in the circle of people with

cognitive impairments (the group claims the term "learning disabilities" for itself; on the problematic nature of the term see Bredel/Maaß 2016a and Schuppener/Bock in this volume). German Easy Language exists alongside additional comprehensibility-enhanced varieties of other individual languages like Easy Finnish ("Selkokeskus", http://selkokeskus.fi, see Bredel/Maaß 2016a: 66) or Easy Swedish ("Lättläst", http://papunet.net/ll-sidor), which partially already have decades of text practice. At the moment, we are seeing a development in other individual languages as well, such as for example Spanish in Europe and America (Becker 2020) or French in Canada (Potthoff 2016).

Since 2009, different rule sets have been presented for German Easy Language by the Netzwerk Leichte Sprache as well as by Inclusion Europe. The rule set from 2009 published by the Netzwerk Leichte Sprache can be accessed in its unchanged version on the homepage of the German Federal Ministry of Labour and Social Affairs (BMAS 2014), the rule set by Inclusion Europe can be found on the European Easy-to-read-platform (http://easy-to-read.eu), which also provides versions in 15 other European languages in addition to the German version. The rules converge across individual languages to a large extent and there are only a few specific rules for individual languages such as for example the rule of segmentation of long words in German. The reason for the high convergence is the cross-language validity of comprehensibility-enhanced strategies, as previously determined in comprehensibility research. This includes for example simplicity in the linguistic and the informational structure, which refer to the word, sentence and text levels (for a comprehensive description of the structural features of Easy Language see Bredel/Maaß 2016a).

Both the rule set by Inclusion Europe as well as of the Netzwerk Leichte Sprache are written in Easy Language. As a result, they address the intended audience of Easy Language and not primarily translators or editors. In standard German, the rules of Easy Language are formulated in the appendix to the Ordinance on Barrier-Free Information Technology (Barrierefreie-Informationstechnik-Verordnung, BITV 2.0, see the article by Lang in this volume). The three mentioned practical rule sets (Netzwerk Leichte Sprache, Inclusion Europe, BITV 2.0) formulate a total of 120 rules for improved comprehensibility and converge on 17 of these rules (for details see Bredel/Maaß 2016a: 82 ff.):

visual and media design	1. bigger font size 2. each sentence in a new line 3. no hyphenation at the end of a line 4. left aligned
morphology	5. short words 6. segmentation of complex words with hyphens 7. no abbreviations 8. avoid passive voice
lexis	9. easily comprehensible words 10. preferably no foreign words 11. explain foreign words
syntax	12. short sentences
semantics	13. avoid negation
text	14. be consistent with terms at noun level 15. relevant information at the beginning 16. subheadings are welcomed 17. direct address

Table 1: Converging rules (Netzwerk Leichte Sprache, Inclusion Europe, BITV 2.0) according to Bredel/Maaß (2016a: 89)

The rules demonstrate a high level of intuition in terms of the topic and are suitable for identifying texts in Easy Language. However, they are not differentiated enough for professional text practice because they only describe a desired state ("short sentences"), but do not contain an approach on how this can be achieved:

- How should conditional clauses be dealt with?
- How should a complex noun phrase containing abstract concepts be dealt with in order to make it "easily comprehensible" as described in the rules?

Practical guidelines become problematic when they interfere with German orthography (Bredel/Maaß 2016a: 330 ff., Bredel/Maaß: 2017). This applies, for example, to the suggestion of using hyphens to segment "long words" in Easy Language, in spite of the standard rules of orthography. In text practice,

this leads to misspellings of the types "Kranken-Haus", "Unter-Suchung" or "Bei-Stand". These are all examples taken from the official websites of German authorities. Orthography and grammar violations do not reduce the likelihood of successful comprehension (Bredel/Maaß 2017) but do increase the stigma that is connected to users of Easy Language and also provoke prejudices against Easy Language and its recipients among readers with no communication impairments (see below and the article by Maaß in this volume).

The rule sets also convey that the use of the formulated rules will lead to maximally comprehensive text practice, which is not the case: A mechanical application of the rules often results in problems at text level because fundamental characteristics of texts, for example cohesion, intertextuality or signalling of the text type cannot readily be reconciled with the rules at word and sentence levels (see the article by Maaß in this volume and the formulated research desiderata in this article (Chap. 6)).

Regarding the question of the addressees of Easy Language texts, the rule sets are ambivalent. The rule set of the Netzwerk Leichte Sprache initially identify a broad circle of potential readers:

> Easy Language can help a lot of people.
> For example:
> - people with learning difficulties,
> - people who cannot read well,
> - people who cannot speak German well (BMAS 2014: 5, English translation of the German original text)

On the other hand, a gatekeeper-function is postulated for "people with learning disabilities" (respectively cognitive impairments) with reference to text assessment, which in the opinion of the Netzwerk Leichte Sprache is a component of text production:

> Assessment is very important for Easy Language.
> Assessment is a part of Easy Language.
> The assessment is performed by people with learning difficulties.

> Only they can tell if a text is easy enough. (BMAS 2014: 21, English translation of the German original text)

This position implies that Easy Language texts are primarily meant for people with cognitive disabilities and that these texts should be optimised for them, even though there are also others and numerically far more potential target groups of Easy Language.

2 Easy Language in the context of legislation

From a political perspective, Easy Language is an instrument to implement inclusion. It aims at enabling people with communication impairments to participate autonomously in all areas of life. The UN Convention on the Rights of Persons with Disabilities (UNCRPD) is of central importance here, having paved the way for a new conceptualisation of disabilities (Degener 2015): Not the individual person with a disability has to be "rehabilitated" but society as a whole has to reduce barriers and thus become more accessible. The UNCRPD was passed in 2006 and came into force in Germany in 2009. In the meantime, this international treaty has so far been signed by 160 countries (Status February 2018, United Nations Treaty Collection). In Germany, the UN Convention on the Rights of Persons with Disabilities has had a significant impact on legislation (see the article by Lang in this volume). In particular, the amendment of the German Act on Equal Opportunities for Persons with Disabilities (Behindertengleichstellungsgesetz, BGG) of 2016 deserves a special mention. Now, the added § 11 of the BGG proclaims the following: "Public authorities […] are obliged to explain decisions, general rulings, contracts under public law and forms in Easy Language on demand for people with learning disabilities and people with cognitive or mental disabilities" if required by this group. In the follow-up cost estimation for the draft of the law, 600 000 inquiries per year are assumed for the circle of beneficiaries (BGG draft 2016: 4, 25, English translation; for the wording see the article by Maaß in this volume). For this reason "a basic stock of explanations for particularly relevant documents […] has to be created in Easy Language and provided as a basis to authorities" and

expanded step by step in the form of a "pool of model explanations" (ibid., English translation). Thus, in Germany the main focus regarding the use of Easy Language emerges for the legal-administrative domain. In other countries like Finland or Sweden, the focus is more on news or the field of literature/fiction (Leskelä 2017, Bohman 2017).

Section 11 of the BGG limits the entitlements to texts in Easy Language to "people with learning disabilities and people with mental disabilities" (§ 11 BGG new, English translation) and assumes approx. 200 000 beneficiaries (BGG draft 2016: 4; 25), requesting on average three explanations in Easy Language per year. Only a small proportion of the potential addressees has a guaranteed right to Easy Language versions of "decisions, general rulings, contracts under public law and forms". If these texts, however, are available from a pool of model explanations, a larger circle of persons could also benefit from the texts that have already been created. In addition, § 6 "Sign language and communication of people with hearing and speech impairments" explicitly refers to people with speech impairments having a right to "suitable communication aids". The Ordinance on Barrier-Free Information Technology (BITV 2.0) of 2011 also does not specify the Easy language texts offers for people with cognitive or mental disabilities.

However, the question regarding the addressees of Easy Language remains undetermined both in terms of empowerment and in politics. A part of the people or groups of people, for whom the source texts are imperceptible and/or not comprehensible enough, would also be able to cope with texts that have a lower degree of improved comprehensibility (e.g. from the spectrum of Plain Language, for this see Bredel/Maaß 2016a and 2016b). Nonetheless, these texts are possibly not comprehensible enough for the primary addressees of Easy Language texts. From an economic perspective, the question arises whether the resources should be allocated to multiple text levels or to an overall broader text offer. From a legal point of view, it must be decided which groups really have a claim to texts in Easy Language. This question is not to be equated with the question of who ultimately benefits from existing texts.

3 Scientific conceptualisation of Easy Language

For many years, Easy Language has increasingly become an object of scientific research, including numerous different approaches. Differences can also be found, amongst other things, in questions such as

- who the texts in Easy Language are addressed to,
- whether an Easy Language practice should simply be descriptively observed (for example Bock 2015 and more) or whether conclusions for the design of Easy Language could or should be derived from previous research on comprehensibility and the requirements of the different groups of addressees (see e.g. Bredel/Maaß 2016a and b)
- whether Easy Language should be conceptualised as predominantly homogenous or have different levels in itself
- and whether Easy Language should be structured by basing it on rules or by basing it rather on functions (Bock/Fix/Lange 2017b)

There is a broad consensus with regard to the continuing desideratum to perform empirical research.

The Leipzig School of Easy-Language-research questions the suitability of Easy Language to take into account the addressees' heterogeneity (for this see the study of Bock 2015 and more, Bock/Lange 2017 and the article of Schuppener/Bock in this volume, but see also Lasch 2017). The assumption of the Hildesheim School (Bredel/Maaß 2016 and more, Maaß 2015 and more, Maaß/Rink/Zehrer 2014) stands in contrast to this and states that, although specific requirements of the texts for different groups of people do differ, the principles of text comprehensibility can nonetheless claim supra-individual validity, which is why different groups of people benefit from these texts in Easy Language that are structured according to the principles of maximally-enhanced comprehensibility.

Also the question of where Easy Language is categorically located, is answered inconsistently. Wagner/Schlenker-Schulte (2006 and more) and Wagner (2015 and more) consider "Leichte Texte" (Easy texts) to be those that are adapted both linguistically as well as in terms of content. These texts

are contrasted against Plain Language, which merely conducts linguistic simplifications but not in terms of content. Therefore, they define different levels of text complexity with Easy Language being located where consistent information no longer exists.

Language barriers, which the authors identified in their approach and that are edited using reformulation strategies (see Wagner/Schlenker-Schulte 2015: 6 ff.), converge to a great extent with what the practical rule sets (Inclusion Europe, Netzwerk Leichte Sprache) as well as scientifically based recommendations (Duden Leichte Sprache: Bredel/Maaß 2016) identify as detrimental to comprehension and that are consequently deselected. Bredel/Maaß (2016a and more) and Bock (2015 and more) as well as Bock/Fix/Lange (2017b: 12) describe Easy Language as a variety of German and locate the term at the level of the language system. However, the way in which this variety is described diverges to the same extent as do the questions and methods within the research area: While the Leipzig School (see for example Bock 2014) sets itself the task of watching and describing the developing variety, the Hildesheim School (see for example Bredel/Maaß 2016a) opts to evaluate the variety, modify and complement the existing sets of regulations on the basis of existing research on comprehension/comprehensibility and groups of addressees and to develop suggestions for dealing with certain types of texts and areas of discourse from a translation studies perspective (see for example Rink 2020).

Empirical research on Easy Language is still in its infancy. At this point, we would like to draw attention to the LeiSa-study by the team in Leipzig, who investigated the use of Easy Language in professional life using an empirical-participatory approach (see Bergelt/Goldbach/Seidel 2016, Goldbach/Schuppener 2016, Lange/Bock 2016). An overview of smaller partial studies on understanding and comprehensibility of Easy Language texts can be found in the research reports by Bock/Fix/Lange (2017a: 253 ff.). First reading studies on examining the Easy Language rules with the help of technical-quantitative measurement methods are available in Gutermuth (2020) and Hansen-Schirra/Gutermuth (2018). Potential problems associated with the implementation of research designs with subjects with disabilities are presented in Bredel/Lang/Maaß (2016).

4 Stereotypes in the discourses on Easy Language

Easy Language is recognised in the empowerment movement, science and even in legislation as a tool for communicative inclusion for people with reading disabilities. In the public perception, however, Easy Language is conceptualised quite ambivalently: Besides its role as an instrument of participation, it is repeatedly perceived as an attack on education culture and a sign of the decline of language. In an interview with *Neue Zürcher Zeitung* (a daily newspaper in Switzerland) from 8 September 2014, Rainer Bremer, an education scientist from the institute of Technology and Education in Bremen, commented negatively on Easy Language, which he perceives as an attack on linguistic education:

> Texts will become meaningless if there are no attempts to develop an understanding of a language through education and information but vice versa, adapting language to the state of knowledge of the people. This is essentially anti-education. This, however, is not a novel development. What is new is the fact that the whole world is convinced of its merit and hardly anyone is objecting. […] Of course, this is based on clientelism. There are people who side with the disadvantaged but, in reality, they just want to benefit from it by offering a service for money, which, in the best case, leads to falsification.
> These people who propagate "Easy Language" come up with strange sentences that sound like parodies of people with disabilities. […] This is even worse than real-life satire. And there is also a moral aspect: The dignity of these people is being undermined. This would have been unthinkable 20, 30 years ago. The disability organisations would have been up in arms proclaiming: "You are presenting us in a disastrous way!" And today they are proud of it. (Neue Zürcher Zeitung, 08-09-2014, English translation of the German original)

According to Bremer, Easy Language is threatening the standard language and is a symbol for the demise of culture. The participants in the field of Easy Language claim a non-existent competence and enrich themselves at the expense of the general public and thus deceive their clients and falsify the statement of

their texts. According to Bremer, the addressees are victims of the producers of Easy Language and their unreasonable text practice but also of the insufficient representation of their interests by their own associations. Consequently, Bremer's contribution addresses all three parameters that have become targets of provocation and stigmatisation in the discourse on Easy Language:

1. Easy Language itself,
2. the producers of Easy Language and
3. the addressees of Easy Language.

The text is a good example of a widely known stereotyping phenomenon in social psychology, as described in, amongst others, the approach of Fiske/Cuddy/Glick/Xu (2002). The authors classify different types of prejudice and noted that these were dependent on the status the evaluating group attributed to another group and whether it was perceived as competition to their own group. On this basis, according to the authors, a high or low competence as well as high or low warmth would be ascribed to the evaluated group.

	Competence	
Warmth	Low	High
High	**Paternalistic prejudice** Low status, not competitive Pity, sympathy (e.g., elderly people, disabled people, housewives)	**Admiration** High status, not competitive Pride, admiration (e.g., in-group, close allies)
Low	**Contemptuous prejudice** Low status, competitive Contempt, disgust, anger, resentment (e.g., welfare recipients, poor people)	**Envious prejudice** High status, competitive Envy, jealousy (e.g., Asians, Jews, rich people, feminists)

Table 2: Four types of out-groups, combinations of status and competition, and corresponding forms of prejudice as a function of perceived warmth and competence (Fiske/Cuddy/Glick/Xu 2002: 881)

In Bremer's text, the primary addressees are assigned a paternalistic prejudice. Accordingly, they are allotted low competence and high warmth ("The dignity of these people is being undermined"). That is why Bremer approaches them with pity and sympathy (see Table 2). Easy Language itself and its text producers as well as the disability organisations are assigned a contemptuous prejudice. Correspondingly, they are allotted low competence and low warmth: "anti-education", "benefit", "clientelism", "falsification", "parodies of people with disabilities" etc. According to the pattern, Bremer approaches them with contempt, disgust and anger (see Table 2).

Related submissions, which express similar stereotypes, are not rare in German feature articles or in the overall discourse on Easy Language. Fiske/Cuddy/Glick/Xu (2002) point out that these stereotypes can be found in relation to gender, ethnicity, 'race' in the USA, class, age and disability, which indicates a high generalisability of these patterns. That is why it is not surprising that the arguments in relation to Easy Language and its addressees are alike and that the stereotypes are ubiquitous.

Such a stereotyped perception of Easy Language potentially hinders an expansion of text offers, for example if potential text providers distance themselves from accessible communication offers due to their own prejudices or in expectation of negative feedback from the public. An improvement of the situation can be achieved by changing the perception of Easy Language (Bredel/Maaß 2016a: 46 ff.), especially by working on the variable "competition". Easy Language does not constitute competition for the German language because the text offers in Easy Language are merely an additional offer. Easy Language will not replace general or technical source texts. It is central here that Easy Language texts, in relation to orthography and grammar, are located within the framework of the German standard and thus do no not represent an attack on the standard language.

Working on the variable "status" would also be beneficial. Social discourse on disabilities can go hand in hand with an appreciation of concepts like diversity and accessibility in society as a whole. Here, the UN Convention on the Rights of Persons with Disabilities and the subsequently developed national action plans (e.g. the national action plan NAP 2.0) have contributed to a new perspective on disability in the last years. However, this initiative has limits

because, in spite of everything, not being able to access general language texts and needing Easy Language is stigmatised in the general perception.

5 Easy Language as a stigma

A need for Easy Language texts triggers negative attributions because impaired communication skills are perceived as a stigma. Jones et al. (1984) identify six dimensions that affect the perception of stigmatisation of a condition (for more information see Bredel/Maaß 2016a: 50 ff.):

1. **Concealability:** A stigma is greater, the more perceptible it is. With Easy Language there is a paradox here: On the one hand, the affected people are able to conceal their stigma more easily through Easy Language texts because they can autonomously access content and can act in society without disclosing their limitation. On the other hand, the presence of Easy Language texts in public spaces draws attention to the fact that there is a large number of people who rely on these texts.
2. **Course:** A permanent stigma is perceived as more serious than a temporary one. For the public, Easy Language is generally more acceptable as transitional stage than if the readership has to depend on Easy Language permanently. There are large deviations between groups of addressees: A few of them will potentially be able to access the standard texts sooner or later; others remain dependent on Easy Language permanently for the foreseeable future. In addition, the different types of texts and subject areas also present respectively different images: While general language texts with everyday content can or will be accessed by some parts of the readership (with increasing reading experience) in their general language versions, this does not apply to the same extent to specialised texts, for instance in the legal-administrative domain. Overall, it is noticeable that the concept of Easy Language is perceived as less stigmatising if a progression of reading skills appears possible.

3. **Disruptiveness:** The stigma becomes greater, the more the social interactions of the affected people are disrupted. Here the paradox repeats itself: The mere presence of Easy Language texts in public spaces is proof that the affected people are not able to access information or discourses without additional aids. At the same time, the existence of the texts results in the ability to overcome isolation because Easy Language texts make participation possible.
4. **Aesthetic qualities:** If an impairment is perceived as repellent, it increases the stigma. Easy Language optimises comprehensibility at the expense of the aesthetics of language. Variance and diversity, exploitation of lexical and syntactical possibilities, indirectness and intimation, playing with language – those and other strategies, which highlight linguistic beauty, are not accessible at all in Easy Language or only to a very limited extent. Therefore, Easy Language is perceived as aesthetically inadequate, which increases the stigma. This stigma is almost insurmountable since the intervention into the aesthetics of language represents a fact and there are only a few very limited opportunities for action.
5. **Origin:** A self-inflicted stigma is greater than one that is not considered to be caused by the affected people themselves. That is why references to the fact that Easy Language addresses people with disabilities regularly reduces the stigma. However, this only applies to a part of the addressees. Functional illiteracy is often perceived as self-inflicted, which leads to an expansion of the stigma for this group.
6. **Peril:** If a stigmatised group or object poses a danger to others, the stigma is perceived as particularly strong. Easy Language is perceived as particularly stigmatising if it is perceived as a threat to standard German as the language of the educated. This can occur through interference with the language system (for example allowing incorrect orthography like hyphenations of the type *Unter-Suchung*) or through attempts to address a readership without communication impairment with texts in Easy Language and postulate them, so to speak, as the new standard. Both regularly lead to strong

rejection. This is exemplified by strong reactions to voting notifications in Easy Language, which, according to the new election law for the state election of 2017, were sent out to all voters in the German Federal State of Schleswig-Holstein. The goal of achieving a bigger voter turnout with this measure failed and instead triggered fierce protests among voters and caused bad press for the state governments across the country (for press coverage on Easy Language see Diekmannshenke 2017). Because of this, in October 2017, an attempt was made to change election law in order to revoke the Easy Language notification obligation of the general election, which is enshrined in the state election legislation (state parliament Schleswig-Holstein, 11-10-2017).

On the other hand, Goffman (1967) already indicated that a potential stigmatisation can be met with "situation management". This coincides with the hypothesis above that working on the variables "competition" and "status" will lead to a mitigation of the stigma and the paternalistic and contemptuous prejudices.

6 Research desiderata

Although research has been dealing with the phenomenon of Easy Language for several years and there has been an overall increase in studies in the field of accessible communication, considerable research desiderata remain, especially in view of an already manifested, but not always functional practice. In particular, the following fields should be mentioned here:

1. **Empirical studies:** The rule sets from practice and academia are currently based on experience and (scientifically justifiable) assumptions. But, so far, there has been little empirical research regarding Easy Language with test persons from the different target groups. However, there are already some initial approaches and pre-studies (see above Chap. 3). Nonetheless, it must be empirically examined

whether, how and to what extent Easy Language in its current form is a functioning instrument to actually improve the participation of the addressees. For this purpose, it is necessary to have studies on the comprehension and comprehensibility of texts written in Easy Language. But, there is also a need for practical studies, for example with regard to forms of active participation of the addressees in social discourses or with regard to a possible relief of the burden on authorities.

2. **Conceptual evolution:** Although the concept of Easy Language is partially well described, the realisation of the rules does not yet lead to consistent text results: For instance, compliance with all reduction requirements at word and sentence levels leads to manifest problems at the text level: Elements which increase comprehensibility locally (i.e. at word and sentence levels) may be contrary to comprehensibility at the text level. This is the case, for example, when detailed or repeated explanations impede the thematic development of a text or when the visual macrostructure of a text does not provide any information about the text type due to homogeneous layout features (i.e. one sentence per line; indentations to clarify hierarchical relations, restriction of fonts). Easy Language rules can also conflict with the requirements of text types – for example, the rules to present events in a chronological order conflicts with the requirements of news texts that usually start with the news and not with the background. Since solutions are linked to the respective text types and target situations, editing at text level in all its diversity is a desideratum of Easy Language research. Of particular interest here are, among other things, insights into the hierarchy of rules at the different linguistic levels, the interrelation of different rules and text-type-sensitive strategies for dealing with the dilemmas.
3. **Analysis of social discourse (stigma and provocation):** If the public discourse on Easy Language with regard to the dynamics of stereotyping and negative attribution is better understood in sociological, socio-psychological, discourse-theoretical and political terms, strategies for a problem-reducing implementation of Easy Language in social practice could thus be derived.

Interdisciplinarity is needed to effectively map the research area: Easy Language is part of the research field of accessible communication, which is discussed from the perspective of very different disciplines (special education, psychology, social and organisational education, communication theory, media theory, translation studies, linguistics, language didactics etc.). So far, there have been hardly any points of contact between researchers. However, these are necessary to develop, review and implement general communication strategies. In addition, close cooperation between research and text practice is required because this kind of cooperation allows for pilot studies with scientific support and monitoring structures that can document implementation processes and highlight what a good and functioning practice can look like.

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Christiane Maaß

Translation into Easy Language

1 Easy Language as a variety of German with enhanced comprehensibility

Starting as a practical concept, Easy Language has increasingly been scientifically elaborated since the 2010s (see the article by Bredel/Maaß in this volume). In the early stage, empowerment movements pointed to the urgent demands for texts in Easy Language to enable participation for the target groups with communication impairments. In Germany, a legal situation developed based on the UN-Convention on the Rights of Persons with Disabilities (UNCRPD) that supports – at least to a certain extent – the demands for text variants, especially for texts in the domains of legal-administrative and other regulatory communication in Easy Language (see the article by Lang in this volume). In addition, the number of available texts in Easy Language is currently further increasing in other areas of society including the media sector (see the article by Heerdegen-Wessel in this volume), the medical sector (see the article by Schindler in this volume) or the cultural sector (especially the museum, see Al Masri-Gutternig/Reitstätter 2017 and the article by Schum in this volume). Occasionally, texts are specifically created for those sectors, but in most cases, Easy Language texts are linked to already existing texts in the source language and thus are a form of intralingual translation (see below for a definition).

Easy Language is a variety of German with a reduced lexical and grammatical inventory. It focusses on a central and everyday vocabulary, thus on key words that are stylistically neutral, precise, have few connotations and are non-metaphorical (for a designation of this vocabulary see Bredel/Maaß 2016a: 345 et seq. and Bredel/Maaß 2016b: 75 et seq.). If a text needs peripheral – especially technical – terms due to the subject or function of the text, these terms are explained in the text. Text-based abbreviations like *bzw.* (resp.)

or *z.B.* (e.g.) are avoided while lexical abbreviations of the central vocabulary like *LKW* (abbreviation for *Lastkraftwagen,* the German term for lorry) or *WC* can be used. Long compounds (and within certain boundaries, derivations as well) can be segmented in order to visualise the linking components and thus support not only perception but also word comprehensibility by highlighting previously known words inside long compounds (cf. Bredel/Maaß 2017). For this purpose, either the hyphen (*Narkose-Facharzt*) [anaesthetist] or the mediopoint (*Zusammen·arbeit*) [cooperation] is used. In the second example, two words with two and three syllables (*zusammen*; *Arbeit*) [together; work (n.)] – known by most readers – are separately visualised in a word with five syllables; the compound semantically results from the connection of its two parts. This is also true for the first example, which includes a technical term (*Narkose*) [anaesthesia] that can be perceived more easily by using the hyphen and, in the next step, can be complemented by an explanation or was already introduced in the text beforehand. The preservation of the correct German orthography is vital because incorrect hyphenation with in-word capitalisation – as often used in Easy Language practice (**Kranken-Haus*; **Eigen-Name*; **Unter-Suchung*) [hospital, proper name, examination] – stigmatise the readers and are considered as provocations by many readers (for stigmatisation based on Easy Language see Bredel/Maaß 2016a: 45 et seq. and the article by Bredel/Maaß in this volume). Furthermore, incorrect hyphenation can constitute an obstacle for a transition into regular writing for readers who only need Easy Language temporarily or for particular text types. They are confronted with the problem that some words learned from the Easy Language cosmos are actually misspellings. Last but not least, incorrect hyphenation complicates the recognition of respective words beyond the Easy Language cosmos, for example, for visitors at the beach who are looking for a *Tageskurbeitragsautomat* [spa tax machine] which is referred to as **Tages-Kur-Beitrags-Automat* in the Easy Language text.

Easy Language disregards subordinate clauses and, where possible, main clause series at sentence level; instead it uses simple main clauses. However, necessary main clause series are highlighted via layout by using enumerations with a visualised segmentation structure.

Figure 1: Teaser of a news article on www.einfach-heidelberg.de, text from 11 February 2018

Easy Language texts have a less complex information structure and use verbal over nominal style. The nominal style is associated with technical writing and designates a syntactical structure that integrates most information in the text by using complex nominal structures (see Rink 2020). Furthermore, Easy Language avoids grammatical categories like the genitive, the passive, the preterite or the subjunctive which are normally used less frequently or predominantly in written language (for substitution possibilities see Bredel/Maaß 2016a: 299 et seq. and 439 et seq., Bredel/Maaß 2016b: 130 et seq., Maaß 2020). Information is illustrated directly on the surface in an action-oriented form with reference to the given world (instead of non-existing circumstances) in the here and now.

Depending on the text subject, the challenge at the text level is to correctly reproduce highly complex information by using less complex means. Voices and opinions are marked in the text and the texts are usually clearly and explicitly action-oriented.

Texts in Easy Language display a macro structure that is easy to understand; this is achieved by subheadings and/or marginalia that support the perceptibility of sub-topics. Easy Language texts often include images and visual guidance systems to preserve orientation for the readers at the text level. For this purpose, quasi child-appropriate images are frequently used in practice (e.g. the image set of the Lebenshilfe Bremen). This, however, is problematic because

an image that is obviously not age-appropriate highlights the readers as different and thus stigmatises them. Furthermore, the text types are uniformised: If all texts include similar images, readers are unable to identify information about the function of the text at first glance. Usually, the visual designs of the source texts vary depending on the text type and thus enable the readers to make assumptions and have expectations that support text comprehension. If Easy Language texts are always visualised in the same way, that resource for comprehension is missing.

Following the respective rules, the layout of Easy Language texts becomes highly homogenous (see the article by Alexander in this volume): enlarged fonts without serifs, each sentence in a new line, indents for both explanations and direct speech. This layout design facilitates perception, but it also eliminates the text type specific differences that contribute to text comprehension of regular textuality due to particular expectations of the audience about content and function of the text. Additionally, this Easy Language layout enlarges the volume of the text and thus restricts the possibilities for translators to create content consistency with the source text. The layout and imagery of Easy Language texts in other countries (like Finland or Norway) are more strongly oriented towards the source texts and thus follow a strategy that – according to the UNCRPD – more closely follows the ideal of Universal Design or participation in the same offers as all other people. Layout and visualising strategies are an urgent desideratum of Easy Language research and practice. Currently, however, a discourse is developing in research (i.a. Merseburg University of Applied Sciences) as well as in practice (see, for example, https://www.inkl-design.de/en/).

In Easy Language texts, the text flow is interrupted by many insertions due to the typical explanation structure (see strategies at word level). Thus, some texts use glossaries, but these are only helpful if the intended addressees need not access them too regularly, because the readers must interrupt their reading process to consult the glossary and then find the right position in the text again (Bredel/Maaß 2016b: 163).

All in all, the Easy Language rules at word, sentence and text levels reduce the differences between text types resulting in more uniform texts. To secure information consistency in the translation, Easy Language texts will be signif-

icantly longer than the source text due to explanations, perception-oriented layout (each sentence in a new line, font size, imagery) and the abandonment of indirect verbalisations. However, reading long texts usually cannot be expected of addressees with reading disabilities. Therefore other ways must be found to translate text content into Easy Language correctly, functionally as well as addressee- and situation-appropriately. Consequently, translation into Easy Language is a tremendous challenge for translators.

2 Translation into Easy Language as a form of intralingual translation

In Germany, translation into Easy Language has developed a rich practice: In recent years, numerous agencies for Easy Language were founded throughout Germany which offer translations of general and technical texts into German Easy Language. The German professional translators' associations expanded their activities to include Easy Language – especially the Federal Association of Interpreters and Translators (Bundesverband der Dolmetscher und Übersetzer, BDÜ), which represents approx. 80% of the organised translators as well as the associated interpreters and translators in Northern Germany (Assoziierte Dolmetscher und Übersetzer in Norddeutschland, ADÜ), the biggest association of translators and interpreters in the North of Germany. In the press release of 8 January 2018, the associated interpreters and translators in Northern Germany stated that (English translation):

> From this day, the associated interpreters and translators in northern Germany welcome translators for German Easy Language. […] From this day forward, the association affiliates language professionals working in the field of German Easy Language translation. Thus, the associated interpreters and translators in northern Germany add this young working field to its associative profile. (ADÜ Nord: press release of 9 January 2018)

The BDÜ has implemented a certification programme for its translators who want to add German Easy Language to their repertoire.

Meanwhile, Easy Language has become a part of translators' training at universities as well. Since 2011, translation into German Easy Language has been included in the Master's programmes in translation studies at the Institute of Translation Studies and Specialised Communication of the University of Hildesheim: 'Media Text and Media Translation' and 'International technical communication: language and technology'. On 1 January 2014, the university established a research centre for Easy Language which pursues a linguistic and translation-related approach. Since October 2018, the University of Hildesheim has offered another Master's programme called "Accessible Communication" that includes, among other profiles, translation into Easy Language.

Classifying the production of Easy Language texts as a form of translation is not compatible with all concepts of translation. Many definitions of translation are based on an interlingual concept of transfer. According to Albrecht (2005), for example, translating is a form of linguistic action and the translation is a written representation of a source text originally written in another language (Albrecht 2005: XIII).

In contrast, Jakobson was already open-minded towards other forms of translation beyond its traditional concept as early as in 1959. Jakobson (1959: 233) distinguishes three kinds of translation:

- Interlingual translation, which he defines as an interpretation of verbal signs by means of some other language
- Intralingual translation, defined as an interpretation of verbal signs by means of other signs of the same language and
- Intersemiotic translation, defined as an interpretation of verbal signs by means of signs of nonverbal sign systems.

In connection to this differentiation and the elaboration of the model by Siever (2010), Bredel/Maaß (2016a) distinguish the following dimensions of translation:

Sign system	Language	Culture
intersemiotic	interlingual	intercultural
intrasemiotic	intralingual	intracultural

Figure 2: Dimensions of translation (Bredel/Maaß 2016a: 183 in modification of Siever 2010: 224)

Following Jakobson and Siever, translation into Easy Language can be conceptualised as intralingual translation. Furthermore, translation into Easy Language is considered intersemiotic when special content – that is only verbally included in the source text – is additionally represented using imagery, as is often the case in Easy Language (for a visualisation of verbally expressed content using images see Pridik in this volume and Bredel/Maaß 2016a: 271–296; Maaß 2020: 220 et seq.). Translation into Easy Language is intercultural when the addressees are from another culture than the readers of the source text. This applies for texts in Easy Language that are created or translated for persons whose second language is German. If Easy Language texts are addressed to persons who are familiar with the German culture, translation into German Easy Language remains intracultural.

Easy Language is not the only form of intralingual and (potentially) intersemiotic translation. In recent years, the field of translation and interpreting has diversified with numerous research areas developing in the German-speaking region – as well as beyond – focusing on forms of translation and interpreting such as subtitles for the deaf and hard of hearing (see Mälzer/Wünsche in this volume), audio description (see Beneke in this volume), speech-to-text interpreting (see the articles by Witzel and Kurch in this volume) or theatre surtitling (Griesel 2007). The theoretical approaches to accessible communication that include a strong translation-theoretical aspect have developed particularly dynamically (for an adaptation of 'traditional' translation theory to sign language interpreting see, for example, the article by Benner/Herrmann in this volume).

This diversification of translation research specialises and professionalises the job of a translator not least because of the new technological developments

in the field of media texts (see Maaß/Hernández Garrido 2020). As a result, the market that, in turn, adapted to user demand also changed.

In the field of Easy Language translation, professionalisation is still at an early stage; many actors in this field are non-professional translators but they are now employed, inter alia, in Easy Language agencies due to their work with the target group. Considering the legal situation (see the articles by Lang and Bredel/Maaß in this volume) in particular, predominantly technical texts will be increasingly translated into Easy Language in the future; these texts cannot be translated adequately by non-professional, intuitively acting translators. In her work "Translatorisches Handeln" Holz-Mänttäri (1984) emphasises the need for a professionalisation of the (interlingual) translation field and believes that it is an obligation of translation research. Insufficient research could lead to poorly trained translators who then might produce poor-quality texts; Holz-Mänttäri (1984: 165) defines this as a "vicious circle" that one could only "overcome in the science sector" (English translation):

> […] because it is the only way that 'awareness' for the conditions can lead to constructive measures. Probing questions, which are asked more frequently in practice at this present historical moment, can foster the awareness process. Therefore, a joint effort by the representatives of the four aspects
>
> - translation user
> - translation producer
> - translation trainer
> - translation researcher
>
> could be a major benefit for a common cause at this present historical moment. The development seems to have reached the point where natural and intuitive acting of the representatives of the four aspects no longer meet the requirements and thus is unsustainable for the overall structure of the 'community'. (Holz-Mänttäri 1984: 165)

Meanwhile, interlingual translation has professionalised itself in the described way and the combination of research and practice has become tangible, for example, in collaborating universities and associations of translators and interpreters with regard to training and further education. A similar development becomes apparent for translation into Easy Language, but it is still at an early stage.

Over the decades of its existence, current translation science has developed a comprehensive collection of approaches and methods which represent a basis for the translation theory of Easy Language. Please refer to Siever (2010) for an overview of the most important trends, especially in German language translation science. Subsequently, the focus is primarily on equivalence-based and functional or target-situation-oriented translation approaches and their transferability to Easy Language translation.

3 Equivalence-centred translation approaches

Traditional translation science is based on the assumption of an equivalence relation between source and target text, whereby the target text provides its readers with access to the source text to which the target text remains committed. According to this, equivalence-centred translation approaches dominated translation science throughout the decades. Usually, equivalence-centred approaches concentrate on the language pairs and are interlingually oriented; Siever (2010: 53) criticises that a range of definitions from those theories only work for closely related languages and he observes a certain Eurocentrism among some of the approaches. Easy Language only benefits from equivalence-centred research to a limited extent, because contrary to the transfer between language pairs, Easy Language lacks equivalents for technical terminology or for certain patterns of text types or the like, which is why the possibilities for literal equivalents are limited between source and target variety. Consequently, representatives of equivalence-centred approaches generally exclude intralingual (but also intersemiotic) translation from their mostly narrow and specific translation concepts. Nevertheless, equivalence-centred approaches are needed for Easy Language translation because the fundamen-

tal assumption of the possibility of equivalence – regardless of its form – is a precondition for the development and the use of translation tools (CAT tools, glossaries, dictionaries etc.; see Hansen-Schirra et al. 2020) which are based on the identification of local equivalences between source and target text (see Bredel/Maaß 2016a: 196 et seq. and 2016b: 66 et seq. as well as Maaß/Rink/Zehrer 2014).

The equivalence-centred approaches were influenced by the studies of Nida (1964, see also Nida/Taber 1969 and others) regarding dynamic equivalence in translations of the bible into not previously scripted languages, which also represent a so far non-emphasised potential for Easy Language translation. Additionally worth mentioning are the works of Albrecht (1990 and more often) regarding equivalence and invariance, the studies on text typologies by Reiß (1976 and more often) and especially the works of the Leipzig School (including Kade 1968 and more often, Jäger 1968 and more often as well as Neubert 1973 and more often) which developed from a linguistic and language-pair-centred to a text-related approach. In Neubert's later contributions (e.g. Neubert/Shreve 1992), he focusses on the text level: the translator produces a functioning target text, but it is still created as a reflection of the source text (even when it is embedded in the target culture). The emphasis of the text level is an important aspect of Easy Language translation as its special challenge is at the text level, whereas a mechanical application of the rules at word and sentence levels generally results in lengthy, often less coherent and cohesive target texts that are non-functional in the target situation.

Koller presents an influential approach to equivalence-based translation science for the German language that distinguishes five "frames of equivalence/reference" (2011: 63; English translation):

- Denotative equivalence refers to the extralinguistic factors and ensures that the target text matches the information of the source text.
- Connotative equivalence focusses on the selection of possible means of expression and defines a similarity or comparability of style, sociolect and so on between source and target text.

- Text-normative equivalence between source and target text exists when they can be compared regarding the specific characteristics of the text type.
- Pragmatic equivalence orients towards the comprehension requirements of the respective recipients who should not only be considered in the source but also in the target text.
- Formal-aesthetic equivalence exists when the target text follows the formal and aesthetic standards of the source text.

Easy Language translations achieve **denotative equivalence** between source and target text through their generally comparable topics. It depends on different parameters whether source and target text contain the same information (see below); usually, text functionality in the target situation has priority over the criterion of information consistency in Easy Language translation, so denotative equivalence, in the narrow sense of the word, will hardly ever be given at text level. Nevertheless, denotative equivalence also exists between source and target texts of Easy Language translations, because both text variants represent the same subject although no complete conformity is reached. In Easy Language texts, technical terminology for example often has a paraphrase or explanation as an equivalent; this equivalent refers to the same extralinguistic subject as the term itself, so that denotative equivalence can also be assumed at those points in the text. Equivalents to explain such terms can also be identified and implemented in terminology work (see the article by Zehrer in this volume and Hansen-Schirra et al. 2020).

In Easy Language translation, **connotative equivalence** between source and target text is virtually impossible, because only central linguistic means are available and implicit information is brought to the text surface. Easy Language is extremely limited regarding its possible means of expression, style, register and so on with the result that connotative equivalence exists only – if at all – in a local or rudimentary way. Consequently, source texts with numerous connotations result in target texts with significant limitations that cannot be compensated. This supports negative attitudes predominantly of the educated middle class towards Easy Language, which, especially in culture sections or comments on reports in online news pages, is often interpreted as a sign of

cultural decay. However, Easy Language is not the new standard but rather an additional text mode; thus, it is not a part of Universal Design, but an "assistive device for particular groups of persons with disabilities where it is needed" in the sense of the German Act on Equal Opportunities for Persons with Disabilities (BGG) § 4, therefore it is an additional information offer.

Text-normative equivalence is also only realisable to a limited extent due to the restricted linguistic means whereas gaining knowledge about possible designs of text types and genres in Easy Language is currently one of the most urgent desiderata in applied Easy Language research.

By contrast, **pragmatic equivalence** between general or technical source texts and target texts is basically possible in Easy Language, because, as the source text must be designed for its addressees in certain target situations, the Easy Language text also meets the comprehension requirements of its readers and recipients in the intended target situations. However, practice frequently demonstrates that the source texts are lacking an explicit strategy that considers the comprehension requirements of its addressees. Many texts, especially in subject-external communication, do not comply with the needs or comprehension requirements of its recipients and thus become a barrier for a huge potential readership (see the article by Rink in this volume). Easy Language texts must always be oriented towards the comprehension requirements of their addressees, even if no pragmatic equivalence with the source text exists. Thus, pragmatic equivalence occurs rather accidentally and exists when the source text focusses on its addressees.

Formal-aesthetic equivalence can (like text-normative equivalence) only be achieved to a limited extent but its principle realisation in the context of the rules can be part of the translation strategy to preserve the bridging function of Easy Language. The bridging function requires a similar structure of the source text and the Easy Language translation at the level of the textual macro structure to enable the readers to alternate between both text variants (Bredel/Maaß 2016a: 57).

In summary, in Easy Language translation, equivalence between source and target text can only be achieved conditionally and partially. The focus on the, at least partially existing, denotative equivalence is helpful to ascertain the possibilities of professional terminology work and thus to provide tools for the

translation into Easy Language, for example, in the form of dictionaries (term > paraphrase/explanation).

4 Target-situation-oriented translation approaches

The functional target-situation-oriented translation approaches however, are particularly useful for constructing a theory for translation into Easy Language, including Reiß/Vermeer's skopos theory (1984 and more often) or Hönig/Kußmaul's (1982) functional translation approach, which focusses on the creativity of translators as well as the action-oriented approaches by Holz-Mänttäri (1984) or Risku (1998 and more often). These approaches aim at a direct transfer into practice and focus in particular on translating as a profession that is carried out by translators in their function as experts in their professional settings (including project execution, contact with the client, developing an adequate translation strategy) as well as the different comprehension abilities of communication partners with regard to the respective subject matter of a text:

> In comparison to other translation theorists […], the functionalist theorists have done the most to empower translators, elevating them to equal status with authors, editors, and clients, entrusting them to make appropriate, rational decisions that best realize the intended cross-cultural communication. (Gentzler 2001: 71)

Allowing insights into the best practices and reflecting the professional practices, these approaches are notably useful in terms of supporting a professionalisation of translators as well as providing conclusive information to be applied in the context of both academic and further training.

These approaches no longer consider the concept of equivalence, i.e. the postulate to achieve the best possible accordance with the source text, as the central concept but rather focus on the concept of adequacy (see a.o. Reiß/Vermeer 1984), which aims at the target text corresponding to its assigned function in the target situation. Accordingly, the status of the source text differs fundamentally from the postulates of theories focusing on equivalence as their

central concept. Following their approach, Reiß/Vermeer limit the importance of the source text in the translation process to a mere information offer for translators whereas the target text is conceptualised as an "information offer about an information offer" (Reiß/Vermeer 1984: 67). This needs to be considered for Easy Language translation in – among others – legal-administrative contexts: legal texts lose their justiciability when translated into Easy Language, i.e. they are no longer referred to as legal texts but "only" as information material about legal texts. Hence, they cannot be used in a purely expert setting – such as claiming one's rights in court – which thus leaves addressees of Easy Language texts still unable to fully understand the actual legal texts. Nevertheless, they can get an idea of the contents of the legal texts as well as an overview of their options for action (for legal translation into German Easy Language see Rink 2020).

Here, the function of the target text changes in comparison to the source text. Nord (1993 and more often) in particular has numerous publications on this aspect. Nord defines translation as "an act […] in which communication between people of different language and cultural affiliations is conveyed" (Nord 2011: 104, English translation). Translators are therefore "part of a communicative interaction aimed at overcoming language and cultural barriers" (ibid.). The aim of translation is the "production of a functional target text following an existing source text, with the relation between source text and target text being specified differently depending on the respective skopos (the desired or requested function of the target text)" (Nord 2011: 17). Thus, the function is not inherent in the text but is assigned in the target situation: the text itself does not "have" a function but "receives" a function in the reception situation (Nord 1993: 9).

The concept of translational action is central in the approaches of Holz-Mänttäri (1984) and Risku (1998, 2016). Initially, these approaches were conceptualised for interlingual specialised translation but can easily be transferred to Easy Language translation and are particularly appropriate in terms of reflecting the translational actions of Easy Language translators. Again, the functionality of a target text in a specific target situation is the main criterion for a successful translation. The target text is conceptualised as part of the target situation within which it is assigned specific functions; Risku (2016) for

instance, draws attention to the target text as only representing a part of the target situation and that it needs to adapt to the requirements of the reading situation in terms of its linguistic and conceptual composition as well as its medial design.

Following the UN Convention on the Rights of Persons with Disabilities, German legislation strives to enable addressees with communication impairments to independently extract information from a text and to not be reliant on the help of a third party (see the article by Lang in this volume). However, Easy Language texts containing expert knowledge often need to be further explained in a mediation situation or accordingly form the basis for the oral communication of the text's subject matter; because no matter how simple the linguistic design of the text is, the Easy Language text may still remain too complex for the addressees to retrieve the information independently. These texts are often embedded in empractical interaction with texts only being part of the target text situation in which further communicative resources are used (for such forms of situated communication see Zehrer 2014). The requirements of such situations have a direct impact on the design of Easy Language texts if they are to be functional in these situations.

Giving an example of a German Easy Language translation, Wilkes (2015) has shown how much a source text and its concrete function can change in accordance with the target situation. She translates a source text that deals with birth preparation for deaf addressees and creates not only an illustrated brochure in German Easy Language (Fig. 3) but also, using the same source material, a card system that can be used during labour and birth (Fig. 4). While the guidebook is written for a reading situation in which only the text provides information about the subject matter, the card system is conceptualised for a situation including several co-present interaction partners. Therefore, the text is only part of a plot structure enriched with further situational elements. This has a radical impact on text design:

Figure 3: Wilkes (2015: 78) Guidebook for deaf expectant mothers before birth

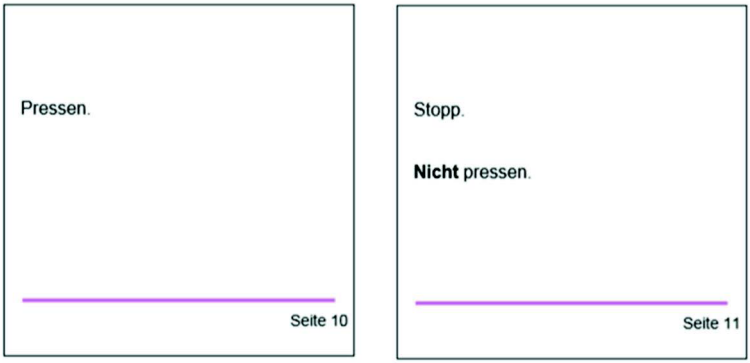

Figure 4: Wilkes (2015: 100) Card system for use during labour and birth

Here, we see that the second translation option no longer fulfils its function outside of the intended target situation because the text must be extended by further situational elements in order to completely transmit its meaning.

Following Risku (2016), a target analysis identifying the target group and their specific needs precedes the actual translation process. Here, the translators do not necessarily adhere to the categories of the source text but decide to align with the addressees' level of knowledge and their ways of thinking because the texts are used "for different purposes in different environments" (Risku 2016: 57, English translation), which has an impact on their linguistic, conceptual and medial design (see the article by Rink in this volume). Starting with a target analysis, the translators derive their target hypothesis that forms the basis for a comprehensive macro strategy in the process of text production (Risku 2016: 59) with the aim of producing a functional target text. Here, the intended purpose of the text in the target situation is decisive as the text itself does not function as a "voice for a mere transfer of information" (Risku 2016: 57).

This also has an impact on the way the source text is dealt with – it is no longer necessarily the only source for the translation:

> The importance of the source text […] is reassessed. Sometimes the source text is considered to have only non-binding information within many other researched texts, whereas other times the text, the author or the situation of its production are treated with a maximum of bindingness, which might be the case in literary translation or document translations. (Risku 2016: 47, English translation)

Risku also describes how, in addition to other written sources, interactions with the clients are important to gather essential information about the target situation, the content that needs to be conveyed, and the appropriate mode of presentation of the messages. This situation is commonly known among Easy Language translators: Often, source texts are not concrete enough and/or are not sufficiently action-oriented to serve as the only source of a functional target text. Therefore, being in contact with the client is of great importance when it comes to producing a functional target text (see also Bredel/Maaß 2016b:

69 f.). The translators anticipate the target situation and advise the client on the possible functions of the target text. For Easy Language, this also raises the highly relevant question of whether the text type in question and its original functionality does or can actually exist in Easy Language. Risku also addresses this question and defines the role of translators as follows:

> Translators as experts for the target culture have an advisory function: They can identify whether a client's request is at all feasible. Does the form of the source text meet the requirements of the function of the target situation in the target culture or is it necessary to adapt it first? Does the respective text type even exist in the target culture? What effect can it have if it is newly introduced there? After all, the linguistic material is only part of a whole. A translation is of little use if no one takes into account whether and to which extent the facts, illustrations, photographs, and the way the translation is used, are appropriate in the target culture. (Risku 2016: 45, English translation)

Following Risku (2016: 51), translations can therefore be considered "responsible transcreations" with translating being a "process of creative release" which involves a "high level of imagination" since the "situation the text is being produced for, […] is always fundamentally different" (ibid., English translation). Hence, translators are not required to mechanically apply translation rules but to try to understand the target situation in order to produce a target text that is functional and adequate in terms of both its addressees and its target situation. Texts that have been produced in such a process of transcreation are completely different, i.e. two different translators will consequently submit two differing versions. Considering the restrictions laid out by the requirements of Easy Language as well as the demands of the addressees, this is when the translators are asked to be creative and it becomes clear that translation into Easy Language presents a great challenge for translators, not least because they have a special responsibility for addressees with communication impairments. Hence, in the foreseeable future, automatised translation processes will not be easily used for Easy Language translation since they would produce target texts which the addressees consider non-functional as these target texts are more closely linked

to the source texts. However, the use of CAT tools is definitely possible (see Hansen-Schirra et al. 2020 and the article by Zehrer in this volume).

5 Easy Language translation as a subject of accessible communication

5.1 Translation as a means to overcome communicative barriers

Following Rink (2020), translation can also be defined by focusing on the barriers texts pose to their addressees: It is possible to speak of a translation when the source text poses a barrier for the intended target readers and the target text tries to overcome it (a sensory barrier, an expert knowledge barrier, an expert language barrier, a cultural barrier, a cognitive barrier, a language barrier or a media barrier). This theory can be applied to various types of translation (intra- and interlingual, intra- and intersemiotic, intra- and intercultural): If, for instance, the text is written in Farsi and the intended addressees of the target text do not understand this language, the text may represent not only a language but also a cultural barrier that can be overcome by means of translation. Nevertheless, a text can even present barriers to readers who have basic knowledge of the German language if they are confronted with a German text that deals with a subject matter the addressees are not sufficiently familiar with or if the text is written using mainly expert language which leaves the addressees unable to comprehend it. The same applies to texts with a mediality that the target audience cannot perceive etc. A target text is considered adequate once the intended addressees are able to understand it without any difficulties. Therefore, translation can be conceptualised as the process of overcoming communicative barriers.

Depending on the type of communication impairment, one text can include different forms of barriers for the target addressees. It is therefore crucial for translators to be well-informed about the addressees' demands for the texts. The translators are "experts for the target culture" (Risku 2016: 45, English translation) and select their translation strategies depending on the target addressees and the target situation. To this end, there are different types of

strategies to choose from in accordance with their translation strategy: linguistic, conceptual and medial (Rink 2020 and in this volume). When translating into Easy Language, various or all of these types of strategies are used in order to produce texts that meet the addressees' needs and are perceived as being adequate in the target situation:

> In order to […] enable participation in the sense of independent text interpretation and thus text comprehension, texts need to be produced that meet the requirements of optimisation in terms of their comprehensibility and perceptibility, that have been conceptualised from the text level and that contain semantic-stylistic devices adapted to the addressees' needs as well as comply with their preferred medial design for information intake. Easy Language comprises all of these aspects […] and is able to meet the high demands of its addressees with impairments and reading difficulties. However, above all, a strong degree of expertise regarding texts and their addressees is necessary in order to be able to provide functional texts that do not only consider the factors which ensure comprehensibility but also further parameters that have an impact on text production such as, for example, situation, medium and communicator. (Rink 2020: 453, English translation of the German original)

5.2 Desired features of Easy Language texts: retrievable, easily perceptible, easily comprehensible, correct and functional

In the preceding sections, the competence of translators, their obligation to take responsibility as well as the opening of a space for creative freedom has been emphasised. This forms the basis for individual, single text-related solutions corresponding to the functionality of the text in the target situation. There are various strategies for this; however, in cases of success, all target texts have the following characteristics: They are retrievable, easily perceptible, easily comprehensible, correct and functional (see Maaß 2020: 29 et seq.).

Retrievable

Initially, being retrievable does not appear to be a feature of the text itself. However, texts are part of reading situations that were considered in a typical form during their production. Therefore, the aspects of where and how a text is made available if it is to be functional in the target situation, have an impact on the linguistic, conceptual and medial design. Often, "Easy Language" texts are not directly accessible but only via general or specialised (hyper-)texts. This is the case, for example, when the language option Easy Language cannot be selected directly in the language settings at the top of the homepage. This poses a barrier to the target group of Easy Language texts if they need to navigate various web pages independently in search of information in Easy Language.

Easily perceptible

Text offers have a medial element that plays an important role in accessible communication due to the mostly higher requirements of the addressees for the medial design of texts (see the article by Rink in this volume):

- a clearly perceptible layout (see the article by Alexander in this volume),
- the visualisation of particularly difficult text segments (see the article by Pridik in this volume),
- possibly an audio version (see the articles by Mälzer/Wünsche in this volume) or
- alternative texts for image resources (see the article by Schütt in this volume).

Translators are neither layout artists nor graphic designers, and they are also not professional narrators; they are responsible for the production of the linguistic parts of the source texts, not for design or visualisation. In their role as experts for the target culture however, they fulfil an advisory function providing the client with recommendations regarding the design and structure of the text. However, at this stage, further experts in the field of text design are responsible for the adoption of these recommendations. Ideally, they cooperate with or consult the translators.

Easily comprehensible

Texts in Easy Language are optimised with regard to their comprehensibility. The translation of a text into Easy Language, especially for specialised texts, poses a challenge to translators: The conceptual complexity of the target text remains unchanged as it still deals with e.g. inheritance law. However, only a limited choice of linguistic means is now available. Moreover, means of reducing and adding sentence segments in order to improve comprehensibility on the sentence level often cause further problems on the text level, for instance when explanations of expert language terms repeatedly interrupt the running text. The application of Easy Language rules eliminates the differences between texts of different text types, resulting in mostly uniform Easy Language texts in terms of layout and linguistic register. While this may improve the perceptibility and comprehensibility on the word and sentence level, it also levels important characteristics on the macro level that the source text readers use to develop their initial assumptions about the intention and function of a text. As experts for the target group Easy Language, translators here have a certain margin of discretion.

Correct

In general, expert communication also uses the respective expert language in order to phrase the subject matters of texts. It is the task of Easy Language to integrate these expert subjects into a text and explain them using reduced linguistic means. This requires the translator to have fully comprehended the expert subject. Professional translators working in the interlingual field often specialise in a particular subject area. Translation into Easy Language has not reached this degree of specialisation yet. Therefore, as a rule, professional experts need to revise and accept specialised translations which Easy Language translators have produced.

The aim of correctness reaches its limits when the linguistic means of Easy Language do not suffice to express complex matters of expert knowledge. This is frequently the case for legal texts, which results in these texts failing to fulfil the whole spectrum of functions originally inherent in the source texts: Easy Language texts used in the field of legal-administrative communication are mostly not justiciable.

Functional

Texts are embedded in processes of knowledge communication: In terms of the text's subject matter, the text author has a communicative intention that is not completely known to the addressees. Otherwise the text would not fulfil the criterion of "being informative" (De Beaugrande/Dressler 1981) and it would be unlikely to be read. Here, the target situation has to be considered as a whole. Hence, the target text is conceptualised as part of the target situation and is adapted according to its function in the concrete target situation. Thus, the target situation a text is being produced for gives insights into possible or plausible modes of perception. Is a text designed for independent information retrieval or will it presumably be perceived in an interaction? Are patients supposed to independently find out more information about their disease and possible treatment options by reading a text in the form of a patient information leaflet or does the text serve as a basis for the consultation with a doctor? The answers to these questions have an impact on the conceptualisation of a text: type and amount of information, presuppositions, necessity and complexity of explanations, mediality (for this see the explanations on target-situation-oriented translation approaches in section 4).

This is the case for all texts; however, experienced readers are, to a certain extent, capable of compensating for the recurrent dysfunctionality of a text. Dysfunctional texts may fail to achieve their communicative aim if the reader's comprehension and memory is already fragile due to a communication impairment.

Persons who have to give a witness statement in court receive a subpoena consisting of various densely filled pages that contain much important information in order to prepare the witnesses for their day at court and their statements as well as to inform them about the (limited) possibilities of non-appearance and the right to claim a refund for expenses and loss of earnings. Subpoenas are texts in the field of legal-administrative communication with a substantial level of expert knowledge and expert language. They also pose a challenge to experienced readers. An information-consistent Easy Language translation of a subpoena results in an even longer target text due to the high density of information and expert terminology that needs to be explained. Rink (2020) gives the example of an information-consistent German Easy Language translation

of a subpoena which consists of almost 40 pages of printed text. This text is not functional in the target situation in a double sense:

- Even though the text is more comprehensible on the word and sentence level and therefore more accessible, the large overall text volume poses a barrier for addressees with reading impairments.
- Since subpoenas are sent by post, the delivery of subpoenas in Easy Language requires a different envelope format, higher postage rates and overall higher costs that are not considered in the proceedings of authorities.

Accordingly, judges are unlikely to decide to actually issue Easy Language subpoenas. Therefore, the Easy Language text is not functional in the target situation even though it is both easily comprehensible and correct to the furthest extent possible.

6 An outlook: Implementing texts in the target situation

The legal situation in Germany obligates public institutions and especially authorities to offer texts in Easy Language (see the articles by Lang and Bredel/Maaß in this volume). The aforementioned are complex organisations in which many professionals from various professional fields cooperate. The orders are often placed by the head of an authority, its communications department or public relations department. Those who then use these texts on a day-to-day basis in their professional environment are rarely the clients themselves. Taking up the example of the subpoena again: In this case, the client was the Federal Ministry of Justice of Lower Saxony (pilot project: Easy Language in the Lower Saxony judiciary, www.mj.niedersachsen.de; the scientific approach to this project can be found in Rink 2020). The text users on the part of the institution are, however, the individual judges who issue the subpoenas and decide whether or not they want to use the Easy Language version, which is made available in their content management systems. Predictably, the actual

text users in the institution will not use the Easy Language texts at all or only sporadically if they have not been familiarised with Easy Language texts or the concept of Easy Language as a whole. So far, it has not become a standard in the field of Easy Language translation that measures to implement these texts in the respective organisation actually reach the individual consultant or text user. Therefore, existing Easy Language texts are often not used in the intended target situations.

At this point, most of the organisations do not have any experiences with Easy Language texts so that their employees usually need training in *increased awareness* and also the *use of Easy Language texts* in order to work with them appropriately. Measures such as *evaluation* and *monitoring* have proven to be particularly useful when working on larger orders, i.e. after a while, it is checked whether the texts are actually used so that, if necessary, trainings or text revisions can be applied to ensure the use of the Easy Language texts. The effort these measures require needs to be already taken into account at the planning stage of a project.

Overall, it can be stated that the professionalisation of Easy Language translation especially in the field of expert communication that also includes legal-administrative communication is still in its early stages. Uncertainties also still exist, often on the part of the clients. The number of available Easy Language texts is limited and the existing texts are often not used to the desirable extent. The draft for the amendments of the German Act on Equal Opportunities for Persons with Disabilities (BGG) presented in January 2016 aims at creating a "pool of exemplary explanations" (German Act on Equal Opportunities for Persons with Disabilities (BGG), draft 2016: 4) in Easy Language, which will be gradually extended and made available for the administrative staff in order to be used in counselling situations:

> A basic stock of explanations for particularly relevant documents has to be created in Easy Language and provided as a basis to authorities. (German Act on Equal Opportunities for Persons with Disabilities (BGG 2016: 4, English translation)

Here, the number of annual requests for texts in Easy Language by text types covered in the German Act on Equal Opportunities for Persons with Disabilities (BGG) section 11 (decisions, general rulings, public-law contracts and forms) is estimated at 600,000:

> Presumably, about 200,000 citizens ask for explanations in German Easy Language three times a year. (German Act on Equal Opportunities for Persons with Disabilities (BGG) 2016: 25)

The aim of providing authorities with a text data base of this sort and transferring it into a functioning practice represents a great challenge for the field of accessible communication as a whole and in particular for Easy Language translation. This goal can only be achieved by a professionalisation of the entire sector, the necessary financial resources and the ongoing support of research following the approach of Holz-Mänttäri (1984).

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Jutta Witzel

Characteristics and interpreting strategies in speech-to-text interpreting

1 Definition and overview of the characteristics of speech-to-text interpreting

Speech-to-text interpreting is the transcription of an orally presented source text that is produced almost in real time (simultaneously), either word-for-word or in a compressed form. The service primarily aims to reach people (recipients) who are hard of hearing or deaf. Therefore, speakers, change of speakers, irony, non-verbal expressions and noises are displayed in the form of stage directions in round brackets, e.g.:

(Speaker changes)
(Phone rings)
(Laughter)

This means that paralingual (e.g. sighing, throat clearing, laughter), extralingual (e.g. if the participants look out of the window because a construction machine is making loud noises) or prosodic (e.g. intonation) information relevant for reception of the text are provided to the recipient. Furthermore, the speech-to-text interpreter takes into account, if possible, the recipients' communication skills such as literacy skills, cognitive skills, eyesight, reading speed etc. A very differentiated definition of speech-to-text interpreting from situational, theoretical and practical perspectives can be found in Platter (2015: 14 ff.).

The distinction between an orally presented source text and its interpretation into written text plays an important role in speech-to-text interpreting. Platter speaks of a "broadly defined area of tension in the reception of a medi-

ally and conceptually oral or medially oral (…) source text and the production of a medially and conceptually written or medially written target text (…)" (Platter 2015: 293; English translation of the German original) that the speech-to-text interpreters must deal with in this specific translation situation. In doing so, they must compensate for adversities such as poor audio quality – Braun (2004: 68; English translation of the original) speaks of "communication under adverse circumstances" – or unfavourable positions in the room and adversities related to work equipment (Platter 2015: 293).

Speech-to-text interpreters use a variety of methods: typing (using a keyboard, velotype or computer-assisted stenotype machine, see below) or respeaking (using a speech recognition software).

In English, different terms are used for speech-to-text interpreting: "Captioning", "Speech-to-text-reporting". These two forms are used in the United States of America as they date back to a time when the process was more akin to that of protocolling (Eichmeyer 2020). The Scandinavian countries Sweden, Finland and Norway as well as the United States of America are among the pioneers of speech-to-text interpreting. Norberg et. al. consider the late 1970s and early 1980s as the beginning of speech-to-text interpreting (Norberg et. al. 2015: 38; cited from Eichmeyer 2020).

2 For whom and where do speech-to-text interpreters work?

A speech-to-text interpreter is typically requested by deaf or hard of hearing people who are competent in written language (Witzel 2018: 16; for the written language competence of deaf people see Hennies' article in this volume). This is especially true for people who developed a hearing impairment later in life due to an accident or illness. In addition, these services are also used by people who are hard of hearing but who communicate with spoken words. People who are deaf or hard of hearing from birth and who communicate using sign language with their parents or at school, are more likely to ask for a sign language interpreter. However, hearing impairments are as individual as fingerprints, and so are the effects. An important group of potential recipients,

that is currently increasing rapidly for demographic reasons, are people with age-related hearing loss. Furthermore, in certain situations, speech-to-text interpreting offers advantages over sign language interpreting for all target groups, for example if a large proportion of specialised language is used and the transcription (transcript, see below) allows for reworking. This is the case, for example, in lectures at universities or specialised conferences.

Other target groups for appropriately adapted (simplified) transcription are people with cognitive disabilities or people who have only limited knowledge of the language being spoken. This could include, for example, participants in international conferences who can follow the conference language better in written form, for example if the speakers speak quickly or with an accent. Or they may be international students who have a limited comprehension of the local language. Speech-to-text interpreters are preferred for dialogues that take place in larger groups: at schools, in training and further education, at work meetings, conferences and team meetings. This is where various complicating factors come together: In these situations, the speaker often stands far away from the hearing impaired person, so that lip-reading is not possible or only possible to a limited extent; there may be considerable background noise; many people are involved in the conversational situation.

Thanks to the implementation of inclusion measures, schools offer an extended field of activity for speech-to-text interpreters. In general, speech-to-text interpreting is used in situations where it is particularly important that the hearing impaired person understands everything that is being said: at the doctor's office, in court, in staff meetings, in telephone conferences. The contents of the conversation are treated confidentially. This is specified in the Code of Professional Conduct for speech-to-text interpreters. The following is an example of the corresponding passage from the Code of Professional Conduct of the German Association of the Hearing Impaired (Berufs- und Ehrenordnung des Deutschen Schwerhörigenverbunds e.V.): Speech-to-text interpreters "commit themselves to maintaining secrecy with regard to all matters entrusted to them or that come to their knowledge in the course of their duties…" (ibid. 2009; English translation of the German original). Another feature is the neutrality of the speech-to-text interpreter. He or she does not intervene in the communication process unless it directly concerns his or her service (e.g. asking the

speakers to speak into the microphone). It is the speech-to-text interpreter's job to ensure that the texts presented orally, including any stage directions, are impartially written out in full.

3 Is speech-to-text interpreting a type of interpreting?

Speech-to-text interpreting and interpreting have many things in common (see Gerzymisch 2013: 2)

- It is a simultaneous service,
- a text (oral) is transferred to another text type (written),
- the product can only be corrected to a limited extent,
- due to the restriction of space and time, a context must be formed (coherence) and the text must be shortened (text condensation),
- thematic jumps in the structure of information must be avoided (theme-rheme-structure).

In her report, Gerzymisch concludes that the term "speech-to-text interpreting" is clear and comprehensible. Tiittula (e.g. Tiittula 2006) and Platter (2015) further prove that speech-to-text interpreting is a form of interpreting. Braun (2004) considers speech-to-text interpreting as "multidimensional translation" (English translation of the German original).

This means that speech-to-text interpreters create coherence (context at the content level) and cohesion (cohesion at the formal level) when they convert the original oral text into a written form.

4 Intralingual and interlingual speech-to-text interpreting

Currently, speech-to-text interpreting is usually intralingual. Interlingual speech-to-text interpreting is, as of yet, not a research topic in its own right,

although concepts from the fields of respeaking and live subtitling could be adapted to speech-to-text interpreting. At Roehampton University in England, research is being carried out on the didactic development of interlingual respeaking (Romero-Fresco/Pöchhacker 2018). There is also international cooperation with regard to quality assurance of interlingual live subtitling (ibid.). Eichmeyer (2020) provides examples from practice of speech-to-text interpreters working intralingually.

5 Interpreting strategies for speech-to-text interpreting

Quality evaluation, interpreting strategies and communication techniques form the scientific basis for further training in speech-to-text interpretation at the 'SDI Munich'. Interpreting strategies include comprehension, planning, target text production and monitoring strategies (cf. et al. Kalina 1998).

Speech-to-text interpreters apply **comprehension strategies** by

- activating prior knowledge (they have prepared for the interpreting job),
- they activate their knowledge during the interpreting job),
- compensating for difficulties in the comprehension process (for example by drawing conclusions from the context),
- inferencing (making explicit what is implicitly said) and
- anticipating what the speaker will say.

The preparation for an interpreting job, especially if it is a specialised topic, contributes decisively to a better understanding of the oral text. This includes reading and listening to relevant texts on the subject, entering (specialised) terminology into the relevant systems, creating abbreviations. If the subject, the type of text, the target group (these features originate in translation studies; cf. Nord 1991) and the speakers are known, speech-to-text interpreters can anticipate content and type of terminology and what style is to be expected. At party conferences of the Social Democratic Party of Germany (SPD), for

example, it can be anticipated that the form of address "Dear Comrades" will be chosen, that the members will be on first-name terms, that words such as "social justice", "elections", "social democratic", "redistribution" etc. will most likely be used. At the micro level, the anticipation strategy can be used, for example, when the speaker uses collocations like "Pull the chestnuts out of the fire for someone". When they hear the word "chestnuts", the interpreters can anticipate how the sentence will continue and thus direct their attention to more difficult text passages, if necessary.

Planning strategies are decisive for a good interpreting product. These strategies are applied receptively (in understanding the text) and productively (in producing the transcript).

- The speech-to-text interpreters segment the text and establish hierarchies and references.
- They have to capture the text's contexts and recognise when units of meaning are completed.
- To make the typeface pleasant for the recipient, the interpreter should start a new paragraph at the end of a unit of meaning – preferably after three to four sentences of medium length.
- The sentences should not be too long.

Particularly in the case of longer sentences and sentences with embedding structures, speech-to-text interpreters can obtain an overview by means of greater décalage (delay between original speech and interpretation) before potentially producing the sentence with a different segmentation. Here is an example; first the original text and then a transcription variant:

> A very clear preliminary backing for further talks with the Christian Democratic Union/Christian Social Union (CDU/CSU) was given at the party conference. But you will surely have noticed: It took hours to finalise this debate, because it was naturally also a question that was suddenly back on the table now that the negotiations for the coalition between the CDU, the Free Democratic Party (FDP) and the Green Party have failed (Deutschlandfunk 2017).

> Preliminary support has been given for talks with the CDU/CSU at the party conference. It took hours to finalise this debate. The question was suddenly back on the table after the collapse of the coalition negotiations. (Transcript in speech-to-text interpreting)

Gerver (2002) examined the translation performance of simultaneous interpreters for orally presented texts with average speaking speed and determined an average delay of 2 to 3 seconds – an equivalent of three to four words – between the presentation and the interpretation. Other studies found comparable delays (Oléron/Nanpon 2002).

Furthermore, speech-to-text interpreters apply strategies of **target text production**. This includes the following strategies:

- transcoding (dealing with names and numbers),
- search for equivalents,
- establishment of coherence,
- compression or expansion,
- presentation strategies and
- emergency strategies (cf. Gile 1995/2009, Kalina 1998 and 2002).

Compression is suitable, for example, if the speaker uses redundant text.

Emergency strategies are used when speech-to-text interpreters cannot reproduce part of the original oral text for acoustic or other reasons. As the name implies, this strategy should only be chosen if speech-to-text interpreters have no other option. In the most extreme case, interpreters erase the text (part), i.e. they omit the text part and mark the omission, for example with "(…)". Other strategies are the following:

- Selection: The speech-to-text interpreters write the parts of the text that they understood.
- Compression: The speech-to-text interpreters condense what is said and thus ensure that the most important contents are conveyed.

- Generalisation: The speech-to-text interpreters phrase what has been said more generally: For example, "several million" instead of "4 million" if they have not understood the number correctly.

If the speech-to-text interpreters use emergency strategies, they should focus on transcribing the subject, predicate and object of the sentence, i.e. the core elements of the sentence. The primary goal is to ensure that the central theme remains recognisable for the recipients.

Monitoring strategies are used both in the reception and in the production of the text:

- The speech-to-text interpreter continuously checks the output for coherence and accuracy.
- He/she corrects the transcript as he/she continues to follow the oral text.

6 Literal reproduction or compression?

The source text can be reproduced in a compressed form for various reasons. A possible case would be, for example, the following: There is a presentation slide/something written on the board that the speaker refers to and that is available to the recipient. In this case, the interpreter informs the recipient that the speaker is reading the text from the slides/board. Other reasons may be cognitive impairments or the fact that recipients want a compressed text in order to be able to follow the text more easily, since for them the reproduction of the content is the main priority.

Speech-to-text interpreting also involves the transformation of an oral text into a written one, the reception of which is subject to different rules. If spoken words were to be reproduced word-for-word in writing, they would often be incomprehensible in the written form (cf. Eichmeyer 2020 and Platter 2015). Speakers temporarily break off sentences, correct themselves (reparations) and speak redundantly. Dresing describes the challenges of subtitling, which are

similar to those of speech-to-text interpreting: "On the one hand, we want to reproduce what has been said as accurately as possible in order to give the reader the best possible impression of the conversation (…); on the other hand, too many details and information make a transcript difficult to read. The aspects of accuracy and meaningful feasibility sometimes lie at opposite poles" (Dresing 2018: 16; English translation of the German original).

In the case of transcription, the interpreter spends additional time dictating the punctuation to the software (speech recognition method) and inserting additional information such as laughter, applause, references to slides, correcting typing/recognition errors. If the speaker's speaking pace is fast and the density of information is high, compression can hardly be avoided: Filler words and unintentional duplications can be left out. If speech-to-text interpreters know the parts of speech, they can react faster and identify the parts of speech that can most likely be omitted, such as filler words and adjectives that are less relevant to understanding the message. Instead of repeating a name, speech-to-text interpreters can use shorter personal pronouns. If speech-to-text interpreters have a flexible, comprehensive vocabulary, they can choose shorter synonyms and thus contribute to compression. They can use interpreting strategies such as paraphrasing (describing in other words, transferring the meaning of the text) and grammatical reformulation (converting passive to active construction, converting a long sentence into two short ones).

Examinations of transcripts of speech-to-text interpreters by Elliot et al. (2001), Tiittula (2006), and Platter (2015) showed that the oral source texts and the transcripts differ significantly. In Tiittula's material, the reproduction rate lies at 60% of the spoken text. Repetitions, sentence breaks, self-corrections, filler words etc. were omitted. Elliot et al. (2001: 286) come to the conclusion that, in the corpus they examined, the speech-to-text interpreters covered 83% of the important units of meaning. In their conclusion, Norberg and Stachl-Peier (2017: 151) call compression in speech-to-text interpreting "not only a necessary evil, but also essential if the main content of the original text is to be adequately rendered".

Platter (2015) examines to what extent the transcripts in the specific translation situation achieve a **successful communication** situation with the respective recipients. Speech-to-text interpreters are often used in settings, consisting

of a speaker A, the interpreter, and a speaker B, the recipient. Accordingly, Platter draws on the so-called interpreting triad in her dissertation on the discourse model by Jiang (Jiang 2008) and applies it to speech-to-text interpreting. Jiang assumes that in the interpreting triad all communication partners are equally responsible for the success of the communication. Speakers A and B as well as the interpreter have a common intersection of linguistic, cultural, subject-specific and general knowledge in the sense of a common level of knowledge that is necessary for the communication (Jiang 2008: 96). Furthermore, they have the same situation-specific knowledge as well as a shared area of attention of the communication partners, taking into account the communication purpose and the communication intentions (ibid. 96 f.; cf. also Platter 2015: 100). Bilateral communication here takes place via the interpreters' bridge, meaning, they interpret the messages of A or B. In the case of speech-to-text interpreting, the recipients B need to understand the interpretation, but usually express themselves and speak directly to the speakers A. According to Jiang, the interpreters apply discourse filters: purpose of the discourse, coherence, general knowledge and individual ad hoc interests (Jiang 2008: 133–142). Using these filters, the interpreters produce their target text close to the source text, modified or with omissions. In other words, these factors and the interpreting situation have an influence on the decision whether and where the speech-to-text interpreter's communication is to be placed on the continuum between a 1:1 reproduction of what has been said and strong compression.

When comparing the source and target texts from her corpus, Platter comes to the conclusion that the comprehensibility of the target text is hardly affected by the deliberate compression of the speech-to-text interpreters. "In some cases, compared to the medially and conceptually oral source text, text optimisation by correcting grammatical structures can also be observed (…)" (Platter 2015: 202; English translation of the German original). She points out "that lexical adaptations are often for the benefit of the target text and its comprehensibility. Lexical errors hardly ever occur" (ibid.; English translation of the German original).

7 A complex process

Due to the compression, meaning the selection and structuring of information within a very short time, the complexity of the process increases. In addition, speech-to-text interpreters perform the acts of comprehension, planning and target text production largely simultaneously, while at the same time checking and, where necessary, correcting the output. Ziegler and Eichmeyer (Ziegler 2017), who are both active as conference interpreters and lecturers in speech-to-text interpreting, have applied Gile's effort model (1995/2009) to speech-to-text interpreting. Gile developed a formula for simultaneous interpreting:

$$SI = L + P + M + C$$

L = Listening and Analysis Effort (mental effort required for listening and analysis of what is heard)
P = Production Effort (mental effort required for the production of the target text)
M = Memory Effort (mental effort required for memorising the source text/message)
C = Coordination Effort (mental effort required for the coordination of all actions)

In the case of simultaneous interpreting, all available capacities of the speech-to-text interpreter must be greater than all the necessary efforts required for listening, analysing, storing in short-term memory, producing the text, including additional information and coordinating all the activities. Otherwise the quality of the output will suffer. According to Gile, the formula is as follows (1995/2009):

$$LR + MR + PR + CR \geq TA$$

The abbreviations are to be understood as follows:

LR = Capacity Requirements for Listening
MR = Capacity Requirements for Memory
PR = Capacity Requirements for Production
CR = Capacity Requirements for Coordination
TA = Total Available Capacity

In speech-to-text interpreting, the Efforts Output Control (OR) and Correction (KR) are added, so Giles' formula should be modified as follows:

$$LR + MR + PR + CR + OR + KR \geq TA.$$

8 Methods of speech-to-text interpreting

In the **typing method**, interpreters use a "standard" keyboard and usually use the touch-typing system (i.e. without looking at the keyboard while typing). Constant practice is needed in order to achieve the high number of keystrokes required for the prompt recording of oral texts. Text processing programs like MS-Word allow for automatic correction of common typing errors. After each assignment, speech-to-text interpreters enter typing errors into the computer program in order to constantly improve the typeface.

Furthermore, speech-to-text interpreters can create abbreviations or text macros for stage directions and frequently occurring words, thus increasing the number of keystrokes (cf. Platter 2015: 29 f.). Examples: "sc" is automatically converted to "(speaker change)", "st" to "(Student)", "fg" to "German Federal Government". The abbreviation and text macro system must be designed in such a way that it can be quickly recalled from memory and implemented in the interpreting situation. There are programs that begin at the operating system level and replace the abbreviations in text processing, spreadsheet and presentation programs with the corresponding long form.

The number of keystrokes can thus be increased with the help of well-maintained abbreviation and text macro systems and thanks to the ability of the interpreters to type at high speeds due to practice and increasing practical experience. Speeds of 350–500 strokes per minute are desirable (cf. Platter

2015: 28 f.) Some speech-to-text interpreters reach much higher numbers of strokes and write at speeds equal to that of the 10th to 34th place in the World Speed Typing Championships (Intersteno 2017).

It should be noted that a high stroke rate alone is not sufficient to make a statement about the quality of the transcription. Efficiently compressed transcripts can also deliver good results with a lower number of strokes.

The capital input is the lowest with this method, but there are certain physical limitations.

Computer-assisted stenotype machines combine the special keyboard of a stenotype with a software solution. The user presses several keys simultaneously and thus writes whole syllables or words. However, according to speech-to-text interpreters who work with this method, a two-year training course is required to learn this technique, as well as additional professional experience in order to master the technique optimally (cf. Platter 2015: 33 f.). This training is currently no longer offered in Germany. The time and expense cost for this method is therefore very high.

Another variant of a quick typing keyboard is the **Velotype**, a Dutch invention offered by the company Velotype VOF. These keyboards are language specific because they work with keys for vowels and first and last letters of words. Several keys are pressed simultaneously to create words. The acquisition costs are lower than for computer-assisted stenotype machines and, according to the manufacturer's statement, the basic skill for this technique can be learned within a short time (Velotype 2018). Speech-to-text interpreters who work with this method also use abbreviations, as in the typing method (Platter 2015: 32).

Speech recognition is a relatively recent software development, as computer processors are becoming more and more powerful and decisive technological progress has recently been made in this field. In 2015 speech recognition was still described as a "recent innovation" (Norberg et al. 2015: 38). The speech-to-text interpreter trains this software with his/her voice and the words he/she uses in his/her interpreting jobs. The interpreter listens to the speaker through headphones or live and speaks the oral text into a microphone (respeaking).

During a face-to-face interpreting session, the interpreter speaks into a stenomask so that the other participants cannot hear the respeaking. The computer program converts the speech into text and displays the text on the screen with a small time delay. The speech-to-text interpreter can correct the output text by using the keyboard or commands in the program. Speech recognition programs currently still have certain weaknesses, including recognition of declensions and conjugations as well as composites, but good results are achieved with the appropriate corrections made by the speech-to-text interpreters.

9 Operation modes during speech-to-text interpreting

Speech-to-text interpreting can either take place on site, as an online-interpreting job or as a combination of the two. During on site interpretations, the speech-to-text interpreters are physically present. During online-jobs, the speech-to-text interpreters are connected via an online platform. The platform enables the speech-to-text interpreters to listen to the speakers, to type and correct the text and to communicate with the recipients via chat. The combined scenario is usually as follows: One speech-to-text interpreter is on-site and another is connected electronically.

Every form of interpretation has advantages and disadvantages: During **on-site interpretation**, the interpreters can interact directly with the recipients and the speakers, they experience the atmosphere and are able to influence the technical conditions. They do not necessarily have to depend on a good internet connection. The challenge for the on-site interpreters possibly consists of background noise that can interfere with the audio quality and, due to the small number of speech-to-text interpreters, on site availability is limited.

Travelling and the setting up period for technical equipment do not need to be taken into consideration for **online interpreting**. The availability of speech-to-text interpreters is higher than for on-site jobs. This operation mode does not offer visual input for the interpreters, which means they lack additional information and are also not able to directly influence the happenings. This

means they cannot request the speakers to talk more slowly or to use the microphone correctly. Furthermore, they depend on a strong internet connection with high transmission rates.

The **combined version** unites the advantages of both scenarios: The on-site interpreter is able to take care of perfect recording and transmission conditions, the online interpreter might have a better audio quality without background noise. More interpreters are available and the logistics for delivering the service are much easier than during on site interpreting.

Work assignments over 60 minutes usually require a **double cast** of speech-to-text interpreters. An equivalent recommendation is given in the Code of Professional Ethics of conference interpreters (AIIC: Code of Professional Ethics, Art. 7.). Teamwork offers the advantage of mutual support during the interpretation. According to prior agreements, they alternate e.g. every 15 minutes. The non-active interpreter supports his/her colleague by helping out during editing or researching (for instance, proper names, numbers), if required. Ideally, both speech-to-text interpreters have access to the same text via a speech-to-text-interpreting platform or via (free or fee-based) computer programs such as Gobby (https://gobby.github.io) or text on top (www.text-on-top.com). Therefore, the computers have to be connected via cables or other types of systems.

The reported factors, such as operation modes, methods of speech-to-text interpreting, single or double casts, single or conference settings and degrees of hearing disability of the target group influence the interpreting situation (for further details see Platter 2015).

10 Career paths

Speech-to-text interpreting is currently offered in Germany as extra-professional further training. Depending on the provider, the mode and scope of further training as well as contents and methods imparted can vary. At the SDI München, they teach subjects such as the psychological aspects of hearing disabilities, business aspects, communication techniques and interpreting strat-

egies as well as the conventional methods and speech recognition. The SDI cooperates with the University of Hildesheim: As part of the degree programme Accessible Communication, SDI lecturers offer speech-to-text interpreting as a compact weekend course. Much of the content taught is also useful in other professional contexts and in daily interaction with people. Translators and interpreters as well as sign language interpreters have good prerequisites for this profession and are recognised as such by active speech-to-text interpreting agencies after completing further training in speech-to-text interpreting (Platter 2015: 295). Interpreters, for example, have already acquired the necessary skills for consecutive and simultaneous interpreting. The further training is also suitable, for instance, in professions that deal with communication and inclusion as well as for logo- and occupational therapists.

11 Speech-to-text interpreters: career prospects

There is a great demand for professional speech-to-text interpreters: According to the German Association of the Hearing Impaired (DSB), there are about 55 certificated speech-to-text interpreters in Germany (DSB 2018). However, there is a need for about 20,000 speech-to-text interpreters, estimates the DSB (DSB. 2016). At the moment, there are no other surveys on current demand. One needs to take into consideration that there are different numerical data on the amount of people who are hard of hearing in Germany (consumer portal for the hearing impaired and hearing aid users 2016). If one assumes that demands from the hearing impaired are only formulated for certain situations, namely those in which there is a legally regulated entitlement to the assumption of costs, we can assume a need for around 3,000 (cf. Platter 2015: 39 f.). Only speech-to-text interpreters certificated by the German Association of the Hearing Impaired or certificated by another recognised training provider are booked for demanding interpreting jobs such as speech-to-text interpreting in state parliaments, at international conferences or for work meetings.

The profession can be practised either as an employee or as a freelancer. Employers are, for instance, radio stations, placement agencies or associations.

Due to the required high degree of concentration, the profession is usually a part-time job that is performed between 20 and 30 hours a week.

12 Remuneration for speech-to-text interpreting services

In the course of the implementation of the EU Council Directive "establishing a general framework for equal treatment in employment and occupation", speech-to-text interpreters generally have a legal right to funding for their services (Directive 2000/78/EG; English translation of the German original). In Germany, the legal foundation is § 17 subsection 2 of the German Social Code I, Equality for Persons with Disabilities Act. According to the German Communication Aid Regulation (KHV 2002), people with hearing or speech impairments are entitled to a sign language interpreter, speech-to-text interpreter or communication assistant during administrative procedures. In agreement with the KHV and under certain conditions, remuneration to the amount of the interpreter's fee, which is paid for simultaneous interpreting in accordance with § 9 subsection 3 sentence 1 of the German Judicial Remuneration and Compensation Act (JVEG 2016), is applicable for speech-to-text interpreting.

The laws and regulations mentioned cover many areas of the requirements for speech-to-text interpreting, apart from services provided in private settings. Every hearing impaired person is entitled to an annual budget for this assistance. However, there are still grey areas that are not regulated, such as conversations between hearing impaired parents and the teachers of their child. Depending on the interpreting situation, the services of speech-to-text interpreters are paid by different organisations, e.g. by health insurance providers, rehabilitation organisations, employment agencies, the integration office etc.

The rates at integration offices vary according to regions. In general, the fees depend, among other things, on the requirements for the interpreting service and whether the service is paid directly by the client or, for instance, by a placement agency. Conforming to the Code of Professional Conduct and Honour, speech-to-text interpreters are required to charge reasonable fees (Code of Honour 2018: § 8).

As reported by professional associations, this fee does not currently include the delivery of a transcript of the interpreting service. The DSB's Code of Professional Conduct and Honour of 27-11-2009 states that all data records have to be deleted permanently upon completion of the assignment and refers to exceptions that have not yet been published (DSB 2009, status 26-02-2018). It is currently common practice that speech-to-text interpreters provide transcripts that are remunerated, if required. Prior to publication of the transcript, it is necessary to obtain the written consent of the people affected by the publishing of their personal data, to ask the speakers for their permission to publish their text and to correct typing and recognition errors. Additional research or formatting work may be required. The transcript represents the intellectual achievement of the speech-to-text interpreter. Therefore, it is protected by copyright which means that its use is limited to personal use. Utilisations beyond this and any incidental utilisation fees must be agreed separately (cf. Eichmeyer et al. 2017).

13 Outlook

The relatively young professional field of speech-to-text interpreting is currently undergoing a professionalisation process. Tseng (1992) developed a model of professionalisation for conference interpreters in Taiwan, which is applicable to every profession dealing with translation (Platter 2015: 207). If one applies his four stages-model to speech-to-text interpreting, the profession would currently be placed at Stage 1: There is an untransparent labour market and strong competition, little sensitivity to the quality of service (Tseng 1992: 44). Training programmes are not consistent (ibid.).

In 2018, a state examination for speech-to-text interpreters for spoken and written language was approved (published in the Official Journal of the Hessian Ministry of Culture). "Evidence of relevant training as a speech-to-text interpreter for spoken and written language or equivalent professional experience of several years as a speech-to-text interpreter for spoken and written language" is stated as the admission requirements for the examination (Official Journal of the Hessian Ministry of Culture 2018: 295; English translation of

the German original). Further information about the state examination can be found on the website of the Hessian Teachers' Academy (2018) who conduct the examination. If one uses the model of professionalisation by Ju as a basis (Ju 2009: 120), the establishment of this examination can be interpreted as a development boost towards the professionalisation of this profession.

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Deutscher Gehörlosenbund e.V., http://www.gehoerlosen-bund.de

Deutscher Schwerhörigenbund e.V. (DSB), www.schwerhoerigen-netz.de

Taubenschlag (website containing information and insights about life with a hearing impairment), www.taubenschlag.de

https://textgedanken.wordpress.com/schreibdolmetschen/

Nathalie Mälzer and Maria Wünsche

Subtitling for people who are D/deaf or hard-of-hearing (SDH)

1 Introduction

Subtitles for an audience that is D/deaf or hard-of-hearing (SDH) are displayed in the lower section of an audio-visual product. They describe what is on the soundtrack in a condensed written form. Unlike interlingual subtitles, they are usually not translations from one language to another. Instead, they are translations from one mode to another, the target mode being the written form. Subtitles for the D/deaf or hard-of-hearing are intended, as implied in the name, for a specific target group, i.e., people who have limited or no access to the soundtrack of audio-visual media. The change of mode is intended to compensate for the loss of information on a verbal, nonverbal and paraverbal level.

In Germany, SDH are used primarily for television. Since the last decade, German public broadcasting services have been increasing their SDH quotas sharply. In 2010, Jüngst pointed out that only 10% of all television programmes in German television were subtitled (Jüngst 2010: 123). Nowadays, these quotas have risen significantly. *Das Erste* has regularly been surpassing a quota of 90% since 2013 (see ARD 2016: 17 and Heerdegen-Wessel 2017: n.pag. as well as the article by Heerdegen-Wessel in this volume). An important factor for this development is a new license fee regulation introduced in Germany in 2013. Since the regulation came into effect, almost everyone in Germany, including people with a hearing impairment, have been asked to pay a license fee for public broadcasting. This prompted public broadcasting services to make their audio-visual products accessible for this target group. SDH is one of a broad range of measures that is able to establish accessibility on a socio-cultural level. The latter is explicitly required by the UN's Convention on the Rights of People with Disabilities (see UN CRPD 2008, and the article by Lang in this volume).

This article deals with the heterogeneity of the target group (part 2) and with different types of SDH (part 3). It also addresses SDH from a translation studies' point of view (part 4). Part 5 deals with central aspects of SDH. Some of the main challenges of SDH, which are mainly related to reading speed and speaker identification, will be discussed in part 6. A short overview of current research tendencies and desiderata will be presented in part 7.

2 The heterogeneity of the target group

The primary target group of SDH are people who have limited or no access to the soundtrack of an audio-visual product. There are different forms of hearing impairment which may also lead to heterogeneous needs and demands in the target group.

The target group for SDH can be described from a medical and a cultural perspective. From a medical perspective, a person's hearing status is determined by hearing loss measured in decibel. Degrees of hearing loss range from mild to moderate to severe to profound. Another medical classification is the onset of hearing loss: Hearing loss can be prelingual or postlingual, i.e., beginning before or after the acquisition of spoken language, which is usually set at the age of about four years (see Lim/Simser 2005: 308). Newborn hearing screenings, which have been a public health service in Germany since 2009, and technological developments in the field of hearing aids and cochlear implants may lead to continuous improvements of overall hearing levels (see e.g. Saß 2002).

This medical perspective is in direct opposition to the cultural approach to Deafness. People who are, culturally and linguistically, part of the Deaf community identify as sign language users. In this sense, Deafness can be defined as a relational disability since it only manifests itself in conversations with hearing people, in which case both parties are equally affected (see Ugarte Chacón 2015: 33; 79).

The target group for SDH therefore includes people with different degrees and forms of hearing loss and different cultural identities. Given the heterogeneity of the target group, SDH may not necessarily be the preferred means of access for everyone. Target group associations also call for the expansion

of other access services such as interpreting into German Sign Language (see Bosse/Hasebrink 2016: 88 f.).

Central target-group-specific aspects are also related to reading skills and literacy. These have been a recurrent research topic in several disciplines since the 1980s (e.g. Jelinek/Jackson 2001, Krammer 2001, Rausch 2011). Hennies (2009: 294 and in this volume) states that a hearing impairment is not necessarily the cause of low reading skills or literacy levels. A delayed acquisition of spoken or sign language, however, may lead to difficulties in learning to read and write (Marschark/Hauser 2011: 103). This may also have a negative effect on the reception of subtitled audio-visual products. This is especially important for children: From the age of seven or eight, they are considered a part of the target group for SDH, yet they are still learning how to read. Studies suggest that children who are D/deaf or hard-of-hearing have lower reading skills than their hearing peers (see e.g. Hennies 2009 and in this volume, Herman et al. 2017, Peltzer-Karpf 1994). Therefore, subtitles are only used by a small number of children (see Jennewein 2016 and Mälzer/Wünsche 2019). Another reason may be that public broadcasting services have only recently started to produce subtitles for children and that this has not yet been noticed by the target group. KiKA, a German public TV channel for children, has been using specific subtitling standards since 2016 to provide suitable subtitles for the target group (see Chapter 3). These new standards are based on research by Jennewein (2016) and Kramer (2016). A research project at the University Hildesheim on subtitling of TV series for children who are D/deaf and hard-of-hearing also generated results from statistical analyses. The project was completed in 2019 and led to the development of scientifically sound subtitling standards for children between the ages of eight and twelve (see Mälzer/Wünsche 2019).

3 Types and application areas of SDH

While subtitles for people who are D/deaf or hard-of-hearing are primarily to be found on television, it is by far not their only area of application. Public television broadcasting services in German-speaking countries make their subtitles available through teletext. Teletext-subtitles can be switched on or

off when needed and are also called *closed captions* (see Jelinek/Jackson 2001: 43), in comparison to *open captions*, which are always visible. Broadcasting services may also provide subtitles in their online media libraries. DVDs and Blu-rays often include subtitles as well.

On German television, there are generally no foreign-language films with German subtitles. There are only SDH for the dubbed version of the film. On DVDs and Blu-rays on the other hand, there are often at least a few subtitling options. In German cinemas, SDH are very rare while interlingual subtitles for foreign-language films can be found more often (see Jüngst 2010: 124). The company Greta & Starks released an app a few years ago that can display SDH for films on smartphones (see Starks n.d.). Recently, there has also been research on subtitling for smart glasses in cinemas (see Starks Datenbrille n.d.) and theatres (see Panthea Smartglasses n.d.). The development of marketable smart glasses, however, has not yet yielded satisfactory results (see Starks Datenbrille n.d.).

SDH can also be classified according to their production process. While subtitles for series and films are created in advance, subtitles for news shows and live broadcasts are created during the broadcast with the help of speech-to-text software and live subtitlers (see Käber 2016: 300). The technique is known as *respeaking* (Romero-Fresco 2011). Live subtitles therefore do not appear simultaneously to the corresponding soundtrack but have a delay of a few seconds. If necessary and depending on the programme, a mix of live subtitles and semi- live subtitles can be used (see Lindner 2016: 312 ff. as well as the article by Kurch in this volume). Live subtitles are used not only on television but for conferences and other live events as well. Subtitles that are projected on a screen during a speech are the result of speech-to-text interpreting (see the article by Witzel in this volume), which is related to live subtitling on television. Speech-to-text interpreting is used for live situations where the speakers and audience members are co-present. Speech-to-text interpreters, however, can also work remotely and join online.

Another form of live or semi-live subtitling can be found in theatres and operas. In this context, they are often referred to as surtitles. Intralingual surtitles are rather common in Great Britain. In Germany, foreign-language productions mainly have interlingual surtitles, intralingual surtitles, however, are

still quite uncommon. Surtitles for people who are D/deaf, hard-of-hearing and hearing have been developed at the University of Hildesheim in cooperation with various theatres since 2015 as part of more inclusive theatre productions (see Mälzer/Wünsche 2018, University of Hildesheim n.d. as well as the article by Mälzer/Wünsche in this volume).

The way in which SDH are designed varies according to the specific context or medium in which they are used. As it has already been pointed out, SDH may vary based on whether they are produced live, semi-live or non-live and whether they are shown in a live situation or embedded in an audio-visual product. Another question that needs to be examined is how SDH can be distinguished from interlingual subtitles in foreign-language versions of films in cinemas or on DVDs.

4 SDH in translation

SDH are usually defined as intralingual subtitles (Jüngst 2010: 123) and distinguished from interlingual forms. The emphasis of this definition lies on the fact that subtitles are created in the same language as the soundtrack of a film or TV programme. Gottlieb (1994:104) further differentiates between the terms "diagonal" translation (for interlingual subtitles) and "vertical" translation (for intralingual subtitles) referring to the change of "channel" that occurs in subtitling, when auditory information is conveyed visually, in written form (Gottlieb 1994: 104). Referring to Jakobson's three forms of translation (1959: 233), he also defines subtitles as an intrasemiotic rather than an intersemiotic translation. The latter is defined by Jakobson as the "interpretation of verbal signs by means of nonverbal sign systems" (ibid.). Gottlieb thus expands Jakobson's triad to include intrasemiotic translation and defines speech and writing as subsystems of one language (Gottlieb 2018: 59). From a semiotic point of view, however, it seems more plausible to define verbal-visual and verbal-auditory modes as different systems. This would then include sign languages, which are, like written language, visually conveyed verbal sign systems. Semiotically speaking, it seems more suitable to take into account the differences between

these modes and thus define SDH as an intersemiotic translation, even though the translation takes place between verbal systems.

SDH furthermore does not only include the translation of verbal information. As people who are D/deaf or hard-of-hearing have limited or no access to the soundtrack of a film, they might miss not only information from speech but also nonverbal and paraverbal (prosodic) information. Noises, music, sound effects and prosodic elements, which accompany the characters' speech and may be plot-relevant, are also a part of the soundtrack. These factors have an impact on how a film is understood. For SDH, it is therefore not sufficient to translate speech into writing. In addition, a variety of non-verbal signs needs to be translated into writing. If we apply Jakobson's taxonomy (1959), this would be considered an inverse intersemiotic translation. In conclusion, SDH can be defined as a combination of intralingual and intersemiotic translation although the intersemiotic changes are not as apparent as for example in audio described films (see the article by Benecke in this volume), where visual elements are translated into speech.

5 Central aspects of SDH

Over the last few years, the public broadcasting services in German-speaking countries have developed guidelines for non-live forms of SDH, which are the focus of this article. These guidelines were developed in collaboration with target group associations (see ARD/ORF/SRF/ZDF 2015). They published principles that are intended as the basis for text editing (ibid. 1). Subtitles may, however, differ from one German public TV channel to the next, because the channels may each have their own standards that are based on the common guidelines. Subtitling guidelines differ internationally as well (see among others Muller 2012 for France, Zárate 2014 for Great Britain).

A unified set of subtitling standards would facilitate reception for the target group, as they would not have to get used to different conventions for every TV channel. Since the implementation of the guidelines depends on the technology that is being used, a standardisation of subtitling guidelines is unlikely, at least at a European level.

Relevant subtitling standards include the number of characters per second, subtitle alignment and position, font, font size and colour as well as the background and outline of subtitles. These formal parameters can be set up in different subtitling software (e.g. FAB, WinCAPS or EZTitles), which help subtitlers adhere to guidelines that may sometimes be conflicting. Subtitlers need to make rule-based decisions to meet an often-narrow deadline.

According to the guidelines, subtitling speed should not exceed 15 characters per second (see ARD/ORF/SRF/ZDF 2015: 2). TV programmes and films for an adult audience mostly adhere to this but there is a margin of up to 20%. This means that individual subtitles displayed at a speed of 18 characters per second are also acceptable. The number of characters per line and the number of lines are defined as well. Currently, the norm is 37 characters per line and a maximum of two lines. The alignment is mainly centred but can also be left- or right-aligned or positioned below the speaker. The guidelines suggest a pyramid form for subtitles (see ibid. 1 f.). There are also specific rules for line breaks (see e.g. Ivarsson/Carroll 1998, Jüngst 2010, Perego 2008). Whether subtitles are segmented following syntax, semantic units or rhythm of speech depends on the specific scene. The choice of font, font size and font colour is partly based on legibility analyses (De Linde/Kay 1998: 15 and Ivarsson/Carroll 1998: 39–48). Fonts without serifs like Tahoma or Arial are predominantly used. In current professional practice, colours are used for speaker identification. However, only a certain number of colours is used: The most frequently used colours are white, yellow, green and cyan. Magenta should be avoided, if possible, as proposed by Baker et al. (1984) and in the German guidelines (see ARD/ORF/SRF/ZDF 2015: 2 and KiKA 2016: 30).

However, this recommendation is not always followed in practice.

Relevant aspects in terms of reading speed and legibility are the duration of subtitles and gaps between subtitles. There are, however, different suggestions: The recommended minimum gap between two subtitles can vary between one and four frames (see ARD/ORF/SRF/ZDF 2015: 2, KiKA 2016: 6, Ivarsson/Carroll 1998: 76). If subtitles go over a shot change, they need to be displayed for a at least 12 frames to one second before or after the shot change (see KiKA 2016: 6). The minimum duration is often set at 25 to 37 frames (see KiKA

2016: 6 and Hezel 2009: 195). The maximum duration should not exceed six to eight seconds (see Ivarrson/Carroll 1998: 64 and KiKA 2016: 6), otherwise, the viewer is likely to reread the subtitle. This rule is based on a study by D'Ydewalle et al. (1987).

There are also guidelines covering subtitling strategies for nonverbal or paraverbal information of the soundtrack. There are different suggestions on how to indicate that a subtitle is a sound or music description and on how and when to describe them. One option is to use a short sentence ("she coughs"), an ellipsis ("laughs"), an infinitive or a nominalised verb ("knocking"). Onomatopoeia ("Haha") are mainly used in children's programmes and animated films. Guidelines suggest that only indispensable information should be subtitled (see KiKA 2016: 16 and ARD/ORF/SRF/ZDF 2015: 3). Subtitle users are expected to be able to follow the programme without subtitles for sounds that can be inferred from the image. Music descriptions often start with musical notes. The subtitle may include a description of the music or lyrics (with or without their interlingual translation). Depending on what is relevant in the context of a scene, music subtitles can also include information on the artist or the title of the song. Descriptions of atmospheric film music bear the risk of being perceived as arbitrary and subjective. On the other hand, descriptions such as "exciting music" or just "music" may not be informative enough. To avoid uncertainties, subtitling companies may support their staff by providing glossaries and standard descriptions.

6 Challenges

6.1 Completeness vs. readability

A main challenge for authors of SDH is the question of subtitling speed. Reading information may take longer than perceiving the same information auditorily. To ensure readability, subtitles therefore often need to paraphrase or shorten by omitting information from the soundtrack. This, however, is contrary to the demand of target group associations that no information should be withheld from the audience in the subtitles; audience members should be able to decide for themselves what is relevant and what is not (see Romero-Fresco

2009: 111 f.). In practice, however, completeness is often difficult to achieve. On the one hand, verbatim subtitles that translate verbal information from the soundtrack word by word, are often rather long and may be more difficult to read entirely in the short time they are displayed. Edited subtitles on the other hand, which omit certain information from the soundtrack, may lead to information loss. While it is the subtitler's informed choice, which information is omitted and which is not, this strategy might be perceived as paternalism by the target group. This challenge led to numerous studies raising different questions, e.g., whether average reading speed has increased over the last years (see Iriarte 2017, Jensema 1998, Romero-Fresco 2009: 115). This challenge is even more relevant for children as a target group for SDH (see De Linde/Kay 1998, Zárate 2014, Mälzer/Wünsche 2019).

Because children are still in the process of learning how to read, the question of a subtitling speed that ensures comprehension is even more important than it is for the adult target group. Depending on the subtitling speed, methods of text reduction need to be considered as well (see Pedersen 2011: 75 f.). Short but accurate paraphrases for utterances might seem an ideal solution since information loss for subtitle users would be minimised. This would, however, lead to differences between what can be read in the subtitles and what can be heard on the soundtrack. For subtitle users with some residual hearing, which is a majority of the target group, this might be distracting and hinder comprehension. A study by Mälzer/Wünsche (see University of Hildesheim – SDH4KIDS) therefore suggests that omission is the preferable method of text reduction.

6.2 Speaker identification

Speaker identification is also a central challenge of SDH. There are different strategies to indicate that a subtitle or a subtitle line refers to a specific speaker. Different font colours can be used, for example. The choice of font colour for subtitles on public TV in German- speaking countries follows hierarchical conventions. These conventions might be perceived as arbitrary or even irritating, e.g., in cases where the identity of a character needs to remain uncertain, as is the case in crime thrillers (see Mälzer 2015: 270 ff.). In addition, the choice of colour could evoke incorrect connotation, for example, if magenta or cyan are

interpreted as gender specific. Furthermore, different font colours can conflict with the aesthetics of a film, e.g. in cases where black-and-white films have colourful subtitles. Finally, legibility has to be considered as well: The legibility of subtitles in magenta is lower than the legibility of black or white subtitles (see Baker et al. 1984). Whenever there is more than one speaker on screen, change of speaker may be indicated by dialogue dashes or by placing single subtitles below the speaker. The latter is included in the guidelines of the German television channel for children KiKA (see KiKA 2016: 7). The positioning of subtitles below speakers efficiently enhances speaker identification only if the speakers do not move across the screen and only if their position does not suddenly change due to shot changes.

7 Research desiderata

Up to now, there is only little research dedicated to music descriptions in subtitles (e.g. Neves 2010). There are interesting studies about the interplay between music and image in film studies (see Chion 1990). However, research is limited on how and whether the effect of this interplay should or could be verbalised in subtitles. This also depends on the subtitlers' cinematographic knowledge. Subtitlers also need to decide whether they want to keep music descriptions to a minimum, which would allow for more time to view the image, or whether they aim for a more complete verbal reproduction of the music in the subtitles. The latter would, however, contradict the guidelines of the public broadcasting companies mentioned above.

There is also the question as to how emojis and symbols can be used in subtitles to compensate for space and time restraints. The use of clear, informative and space-saving symbols such as musical notes and hashes, avatars and emojis is promising (see Civera/Orero 2010) but needs further research. They may be used as labels for characters for speaker identification, as prosodic indications, to disambiguate or as indications of sound or music descriptions or speech that is heard through electronic media. Emojis and symbols may increase acceptance of subtitles among audiences of children and adolescents.

It has not been researched, however, whether their use can enhance comprehension levels for subtitles.

Another aspect that has already been mentioned is speaker identification. A study suggests that some children found the use of colours in SDH to be distracting (Mälzer/Wünsche 2019).

This raises the question as to which alternatives there are to identify speakers in subtitles. There are only very few studies (e.g. Fox 2016) that experiment with the subtitle position, aligning subtitles not only left and right in the lower part of the image but also using different positions on screen or even speech bubbles. Other alternatives that need to be further researched are the use of emojis as character labels or the use of characters' names in brackets in subtitles. Eye-tracking studies may help to find out whether these strategies are helpful or whether they further complicate reading.

Current developments in the practical field of subtitling are connected to the expansion of the broadcasters' online media libraries where certain SDH-parameters, e.g., font size, position and colour, can be adjusted by the users, just like in digital television. News broadcasts in the media library of the German channel MDR can be played at a reduced speed. This would allow for subtitles that are more detailed or enhanced with further explanations.

SDH are also a relevant topic in research on subtitles as tools for (foreign) language acquisition. Studies such as *Subtitles and Language Learning* (Gambier et al. 2014) suggest that when learning a foreign language, it is better to watch a film in that language and use subtitles in the same language as the soundtrack instead of subtitles in the native language. Language learners can benefit from bimodal foreign language input in this way (see Gambier 2014: 161).

Empirical studies on reception, comprehension and acceptance of subtitles remain a desideratum. Since the 1980s, there has been research in the fields of psychology and media studies (see Braverman/Hertzog 1980, Burnham et al. 2008, Jelinek/Jackson 2001) and occasionally in translation studies (see Romero-Fresco 2015). These studies tend to focus, however, mainly on subtitle users and less on subtitling strategies. Further empirical studies with a translation studies approach, particularly in German-speaking countries, could shed more light on this research field.

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Kristian Folta-Schoofs

Machine-based communication and feedback systems

Humans as social beings depend on personal relationships as well as on communication with others and reliable partners in order to appropriately develop individual skills and abilities (Fröhlich/Haupt 1987; Mall 1995; Renner 2004). In addition to perception, attention, learning, memory, thinking and problem-solving, the ability to communicate both linguistically and non-linguistically strongly determines the extent of an active and self-determined lifestyle and the extent to which, and the way, people are able to participate in everyday life (in public, in professional life, with friends and family) and to experience social recognition.

In particular people with special assistance needs who have innate or acquired and long-term multiple damage in sensory, cognitive and/or motor functional areas are normally, due to their physical and/or mental limitations, not at all or not sufficiently able to communicate without aids or the help of others or to master easy communication situations in everyday life independently (by Tetzchner/Martinsen 2000: 10). Apart from disorders in attention, perception and fine-motor control, additional disorders in motivation, memory, thinking, experience and behaviour can complicate expressiveness and communication in social interaction. Being unable or less able to socially understand and communicate might lead to phenomena such as social exclusion, loneliness and neglect. This stands in opposition to the "Convention on the Rights of Persons with Disabilities" (UNCRPD) and the entitlement to full and equal social participation for people with disabilities, agreed upon by the General Assembly of the United Nations in December 2006 (see Federal Law Gazette (BGB1.) 2008, see the article by Lang in this volume). If the loss of communicative expression possibilities already occurs in early childhood, the lack of social interaction opportunities as well as limited opportunities

for action, learning and development lead to increased vulnerability for the development of learning and developmental disorders at an early age as well as cognitive and socio-emotional impairments that make participation in everyday life even more difficult.

In order to enable or improve integration of the affected persons into society according to the goals of the UNCRPD and the general concept of inclusion (Ainscow et al. 2006; Hinz 2009; Amrhein 2011; Sturm 2013, Folta-Schoofs et al. 2017: 18 ff.; Folta-Schoofs 2018), people with multiple disabilities in particular are reliant on care givers who help them make their personal and objective environment more accessible. In addition, implementation of Augmentative and Alternative Communication methods tailored to the economic, practicable and specific wishes and needs of the affected persons is both useful and necessary. This includes all measures that are suitable for enabling or improving expressiveness, communication skills, speech and language abilities of people with disabilities as well as their interaction with their objective and social environment (cf. Kristen 1994: 15; von Tetzchner/Martinsen 2000: 48, see also the article by Musenberg in this volume). According to the statement in the UNCRPD article 2 ("Definitions")

> "'Communication' includes languages, display of text, Braille, tactile communication, large print, accessible multimedia, as well as written, audio, plain-language, human-reader **and augmentative and alternative modes, means and formats of communication**, including accessible information and communication technology".[1]

This means that the UNCRPD explicitly recognises the necessity and use of various forms of Augmentative and Alternative Communication and Easy Language (Bredel/Maaß 2016; see the article by Bredel/Maaß and Maaß in this volume) as a right for people with disabilities.

1 https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-2-definitions.html

The use of additional and alternative means of expression and communication significantly supports the professional relationship and interaction of people with a need for assistance and their care givers in two ways:

1. These aids increase the affected person's ability to communicate and contribute to a substantial improvement of the semantic lucidity and comprehensibility of communicative messages.
2. For care givers, the aids help them to receive more explicit feedback in terms of whether the communication partner has understood and perceived the communicative message correctly.

The use of methods associated with Augmentative and Alternative Communication can therefore optimise social cohesion. This is of special importance in the area of assisted living, for example in the context of creating and planning daily life and leisure activities, but also in the working life of people with a special need for assistance. It is, especially in the latter area, of utmost importance that work instructions are correctly understood, workflows are adhered to and machines are safely operated (Aßmann 2014: 58).

Augmentative and Alternative Communication not only includes interpreting services such as speech-to-text interpreting, simultaneous interpreting and/or oral interpreting, but more particularly also

1. the use of endogenous forms of expression, e.g. facial expression, gestures, changes in body posture and body-physiological parameters (respiration, heart rate), finger and hand signs, pointing gestures, emblems, vocalisations, blinking, Sign Supported German, tactile signs or Lorms,
2. the use of non-technical expression and communication aids, e.g. drawings, photographs, letter, picture/word boards, complex symbol systems, sign language or Braille,
3. the use of simple technical means of communication (e.g. acoustic signalling devices, switches or communicators) and
4. the use of machine-aided (i.e. electronic or computer-aided) expression and communication aids, e.g. communicators with speech

> output, web-enabled PCs, laptops, tablets or smartphones with communication and writing software, mobile eye-tracking and electroencephalography or neuro-feedback systems (cf. Aßmann 2014: 68 ff.).

Communication based on the body's own means of expression is a very cost-effective method of Augmentative and Alternative Communication, but, for the affected persons, is usually only viable with very close care givers and only after working together for a longer period (Aßmann 2014: 67). In addition, disturbances in the analysis of the sound structure and the understanding of the meaning of words as well as the planning, monitoring and performance of the speech act or vocal motoric expression often correlate with additional problems in motoric monitoring and control of non-verbal forms of communication. In many cases, affected persons are therefore not at all or not sufficiently able to compensate for deficiencies in spoken language using written language or any common forms of non-verbal expression and communication, which severely limits the use of the body's own and also of non-technical expression and communication aids.

Furthermore, the use of non-technical aids requires a great deal of practice and a high degree of concentration and cognitive effort from all involved interaction partners, so that using these possibilities of Augmentative and Alternative Communication is usually limited to relatively few and short interaction sequences. Other than that, the successful use of non-technical but also simple electronic Augmentative and Alternative Communication aids requires the affected persons to have intact perception abilities, motor skills and behaviour control as well as sufficiently developed symbol and speech comprehension.

Further significant disadvantages of non-technical as well as of many electronic aids is the fact that these methods do not or only insufficiently show care givers whether the interaction partners were able to follow the contents of the communication attentively or to understand instructions correctly. Precise feedback on the degree of fatigue and attention as well as the depth of information processing is important if people with disabilities are to be given the best possible opportunity to independently translate instructions into targeted actions. Care givers have to be able to know whether instructions have

been given clearly enough. In addition, it can be necessary to immediately check for comprehension of instructions. In these types of situations, newer machine-supported expression and communication aids, which are activated and controlled by eye and gaze movements (so-called "eye-tracking") or an arbitrarily induced change of electrical excitation patterns in the brain of the affected person (so-called "neuro-feedback"), have turned out to be suitable aids. Such methods facilitate:

- machine-based substitution of speech-replacing gestures
- a targeted and conscious influence on the environment (e.g. choice of letters, words, signs or pictures),
- feedback (so-called bio-feedback) on the physiological state of excitement (e.g. alertness or degree of cognitive effort) of the interaction partners and on the quality of their cognitive and affective information comprehension processes (e.g. regarding strength of attention, depth of mental processing of information or emotional involvement).

Machine-supported expression and communication aids, which can also function as bio-feedback systems, include mobile eye and gaze movement systems (eye tracker) and electroencephalography (EEG) systems. For a long time, these methods were mainly used in biopsychological, neuropsychological, medical and neuroscientific research and diagnostics. Meanwhile, they have been successfully developed into mobile machine-supported communication and feedback tools in the fields of care-giving. Due to their easy handling, they are increasingly used in areas of integration assistance in order to improve the social participation of people with special assistance needs (especially people with multiple disabilities) and the interaction with their care givers when it comes to topics such as living, working and receiving support.

Nowadays, standard smartphones or mini tablets and the high-resolution cameras built into these devices enable simple video-based registration of eye and gaze movements (Albrecht et. al. 2013). In order to achieve additional improvements in temporal and spatial resolution, high-resolution front-facing

cameras and infrared LEDs are installed in standard communication devices or in simple glasses frames (so-called "eye-tracking glasses") for the purpose of Augmentative and Alternative Communication. These cameras expose the eye to infrared light, enabling very accurate video detection of the dark pupil. The position and diameter of the pupil is recorded at a data recording rate between 80 and 300 *Hz* (for mobile systems) ("Dark Pupil Tracking", Richardson/Spivey 2004). Data on the position and the expansion of the pupil can be registered as a measure of attention and vegetative excitation processes. Additionally, the position of the corneal reflection, which appears in the camera image of the eye tracker as a small bright spot in the area of the iris, is often also captured. Using the corneal reflection data, head movements, which as motion artefacts disrupt the registration of eye and gaze movements, can be balanced and controlled (Duchowski 2003). An alternative and cost-effective method of mobile eye tracking is electrooculography (EOG). Using this method, two to four registration electrodes are positioned above, below and lateral to the eye. In doing so, changes in electric tensions caused by the activity of the eye muscles that set the eye in motion can therefore be recorded (Rohner 2002).

In general, rapid ballistic changes of visual targets, the so-called saccades, can be captured during eye tracking. The saccades are followed by relatively stable resting phases of the eye, the so-called visual fixations (Huey 1900). With the help of saccades, people can shift the focus of their visual processing from a narrowly defined area of the visual field to an alternative visual target, which thus becomes accessible for deeper processing. On average, healthy adults produce about three to five saccades per second. Depending on organismic conditions, cognitive processing requirements and characteristics of the perceived stimuli, these saccades differ in number, latency, duration, amplitude and velocity (e.g. average velocity and maximum velocity) (Folta/Mähler 2011; Folta-Schoofs et al. 2015: 109 f.). Here, the latency of a saccade is the time interval between the presentation of a visual target and the beginning of the motoric implementation of a saccade. It usually ranges between 250 and 1000 *ms* and is considered a sensitive cognitive indicator as it reflects neuronal processes of movement, decision and attention control (Groner/Groner 1989). Latencies of more than 600 *ms* indicate a reduction of general alertness (vigilance) or fatigue. On the other hand, latencies between approximately 250 and 600

ms can be interpreted as evidence for prominence (salience) or behavioural relevance (e.g. in the sense of an associated reward) of stimuli. Hereby, slower saccade latencies usually correlate with a higher salience and behavioural relevance of stimuli or stimulating situations. Longer saccade latencies can be interpreted as signs of decision conflicts and uncertainties or emotional blockade. Saccade latencies shorter than 80 *ms* are usually classified as anticipatory saccades and reflect the following situations:

- inattentiveness,
- impatience,
- impulsive behaviour (as a sign of an insufficient central behaviour control),
- fatigue.

The amplitude of the saccade represents the physical distance between two visual fixations, i.e. the starting point and the target point of a saccade. It is usually measured in degrees of visual angle (°), with the measuring unit being the angle that results from viewing distance and size of physical stimuli. The duration of a saccade refers to the time the eye needs to move from one fixation point to the next. Typically, the saccadic maximum speed increases with the duration of the saccade. The saccadic maximum speed is defined as the maximum speed during the performance of a saccade and is recorded in degrees of viewing angle per second (°/*s*). In general, saccades are characterised by a short temporal duration (approx. 15 to 120 *ms*) and a maximum speed of approx. 100 to 600 °/*s* (Kömpf/Heide 1998; Leigh/Zee 1999). The maximum speed of a saccade is influenced by a person's mental load and attentional status (App/Debus 1998; DiStasi et al. 2010; Galley 1998). It increases as soon as the person's cognitive load increases (it decreases with fatigue or inattentiveness). Khan et al. (2000) furthermore reported an increase of saccadic maximum speed, which correlated with an increase in general cognitive stimulation, i.e. alertness. Information on processes of perception and information processing can be obtained through the characteristics of saccades, but also through feedback on the position, number and duration of fixations. Therefore, the feedback of various eye and gaze movement parameters can provide a real-time profile

of a person's information processing. This profile supports care givers who are familiar with the interpretation of the reported parameters. It helps them in their attempt to correctly assess their interaction partner's mental receptiveness, mental strain and cognitive and affective condition.

Cognitive and affective processing in the human brain is accompanied by characteristic electric activity patterns (voltage fluctuations) of nerve cells that are located in the brain tissue right below the skullcap. Accordingly, such processes can be reported back using an EEG neurofeedback system. This reporting often accompanies eye tracking using eye tracking glasses or EOG electrodes. Such a feedback system typically consists of two to four registration electrodes (identical to EOG electrodes) that are applied to standardised areas of the scalp, usually to the left and right of the centre of the head. In addition, a reference electrode is needed, which should be as unaffected as possible by task-based brain activity. It can, for instance, be applied to the earlobe or above the mastoid bone which is located behind the auricle. In certain areas of the cerebral cortex (relative to the reference electrode), the EEG registration electrodes can be used to register brain-electrical activity with high temporal resolution (typically between 250 and 1000 *Hz*). The amplitudes of the craneo-electrical activity are in the micro volt range; these are associated with mental processes. Registration even works through the cranial bone and the scalp. The electrical tension curves measured in this way represent sinusoidal amplitudes and frequency changes, which represents the "basic activation" of active nerve cells. They can be tracked "online" (i.e. parallel to data acquisition and usually in parallel to feedback from eye tracking or EOG parameters). Based on their characteristic vibrancy or frequency, they are categorised as delta, theta, alpha, beta and gamma waves and can individually be filtered out of the continuously registered EEG (so-called "spontaneous EEG") using the Fourier analysis (Berger 1929). The determined frequencies can then be associated with certain mental conditions, comparable to the eye and gaze movement parameters recorded during eye tracking, e.g. approach or avoidance motivation, cognitive effort, alertness or fatigue. In areas of care or nursing, in particular the amount of alpha and beta waves is used as neurofeedback signal. Here, alpha and beta waves are in an inverse relationship: A higher number of alpha waves (8 to 13 *Hz*) is seen as a sign of fatigue and is typically accom-

panied by a reduction of the amount of beta waves (13 to 30 *Hz*). By contrast, an increase in the amount of beta waves (with a reduced number of alpha waves) occurs under the influence of sensory stimuli and mental, emotional or physical activity (or mental strain). Gamma waves (> 30 *Hz*) can be observed during particularly demanding cognitive activities that require a very focused (or concentrated) attention.

In addition to using the EEG as a neurofeedback system, this method can be used directly for communication, especially when people are unable or insufficiently able to consciously and purposefully control their muscles. This applies for instance to people who suffer from muscular diseases or so-called locked-in-syndrome. In these cases, the EEG enables an examination of the pre-motoric neuronal program of movement planning, the activation of which immediately precedes a concrete movement (of the muscles). Instead of motor neurons sending the motoric commands to the muscles, EEG systems transmit the recorded neuronal signals to control mechanisms which then can be used to simply operate computers or simple technical devices for Augmentative and Alternative Communication (e.g. communicators with voice output or electronic letter boards) using one's own "thoughts". In order to record the "thoughts" successfully, the affected persons first have to take part in neurofeedback training for several weeks. After successful completion, simple yes/no differentiations can be achieved, curser control (e.g. choosing letters, words, signs or pictures) is enabled and devices and switches (e.g. TV, light switches, etc.) can be operated with the help of one's own "thoughts". This requires the affected persons to have intact abilities of perception, action planning and action control as well as a sufficiently developed or intact understanding of symbols and language.

The methods of electroencephalography and eye tracking with a smartphone, eye tracking glasses or EOG electrodes are non-invasive registration methods that can be used without health risks even by new-borns, infants and toddlers. Moreover, these methods of machine-supported communication and feedback systems have a high degree of practicability. Mobile eye tracking systems simply have to be calibrated at the beginning of the registration in order for the system to "identify" which positions of the pupil and corneal reflection are related to which room coordinates. For calibration, it is necessary

to successively fixate at least five points in the room (one in each corner and one in the middle). With a good understanding of the instructions, this usually takes a few minutes before data registration (and thus feedback of eye and gaze movement parameters) can begin. Eye tracking using EOG is slightly more complex in terms of preparation: Here, the registration electrodes need to be applied and the electrical conductivity of the electrodes needs to be enabled. Again, calibration of the system is necessary at the beginning of the data acquisition process. Comparable to the eye tracking systems, the preparation time required for continuous EEG measurements also takes just a few minutes, since only a small number of (up to four) registration electrodes have to be applied to the scalp and the electrical conductivity of the electrodes has to be ensured. This time expenditure can be further reduced by the use of user-friendly (but more expensive) active or dry electrodes.

Suitable mobile eye tracking systems are available on the market for less than 10,000 euros (as of spring 2018). A 5-channel EEG neurofeedback system, which can be used to simultaneously conduct an EOG and a measurement of brain activity using two EEG registration electrodes, is available for a similar price. Although the systems have become considerably cheaper in recent years, it is still a significant monetary investment for many providers of integration assistance and their funding agencies. Furthermore, in the initial phase, several weeks of training and supervision as well as regular advisory and training activities are required prior to implementation of the technology (e.g. in learning support or in the workshop area of institutions of integration assistance). This ensures that care givers use the methods correctly and that the reported parameters can be adequately interpreted in their entirety. On the other hand, the use of bio-feedback systems can, on the relational level, significantly improve interaction and intensify the relationship between user and care giver. In instructional and learning contexts, the reported parameters can be used to adapt the form of teaching-learning contents to the respective predominant organismic and mental conditions of the learner. As a result, the bio-feedback system also becomes a didactic tool that helps to teach learning contents in a "brain-friendly" way. Some people with severe motor function impairments are no longer capable of linguistic and non-linguistic forms of communication, even if speech comprehension and central nervous conditions

for motor monitoring and control are maintained. They cannot use endogenous and non-technical communication and expression aids. For this group of people, EEG-based communication and feedback systems are currently the only way to create any (though limited) opportunities for social communication and participation.

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Oliver Musenberg

Augmentative and Alternative Communication

1 Defining the term and its historical background

The term *Augmentative and Alternative Communication* (AAC) and its German adaptation *Unterstützte Kommunikation* (UK) refer to all tools and aids related to communication for children, adolescents and adults who are either temporarily or permanently unable to communicate verbally or are only able to do so to a limited extent. Even though the international term Augmentative and Alternative Communication is more precise, the expression Unterstützte Kommunikation has been established as a generic term in German-speaking areas. "Alternative Communication" refers to methods of communication that replace the common use of language, such as for instance Braille or sign language. "Augmentative Communication", on the other hand, refers to additional methods of communication such as Sign Supported German (LBG) or structured visualisations by means of pictures (see Wilken 2018).

Over the last 30 years, Augmentative and Alternative Communication has become an independent, primarily application-oriented field in the context of special education. Over time, efforts have been made to advance theory building in the context of Augmentative and Alternative Communication (see Renner 2004; Lage 2006) as well as to enhance empirical research (see e.g., Boenisch 2016a). Considering that an *inclusive education system* focuses on educational policy and educational science, we can observe that professional discourse is beginning to dissolve its boundaries, since Augmentative and Alternative Communication is also increasingly being addressed beyond the field of special education. Furthermore, Augmentative and Alternative Communication is gradually spreading beyond facilities for the disabled or special education. In addition to the term *special education*, there is also the older expression *remedial teaching* as well as the more recent terms *integrative edu-*

cation for people with disabilities, *rehabilitation education* and *aided education* to describe the scientific field and profession. Even though these terms have different historical origins, they are often used interchangeably. In Germany, the scientific field of special education is divided into different disciplines. These disciplines have developed in the course of the historical emergence of the professional field and the formation of institutions aimed at specific groups of persons. Furthermore, the current diction of the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany (Kultusministerkonferenz) lists these disciplines as different special education focuses (see Sekretariat der Ständigen Konferenz der Kultusminister 1994). It was primarily these special education focuses on physical and motor development (see Boenisch 2016b) as well as cognitive development (see Musenberg 2016) that initially inspired the development of Augmentative and Alternative Communication in Germany (to learn more about the critical discussion of disability-specific classification systems see Walgenbach 2018).

The *International Society for Augmentative and Alternative Communication (ISAAC)* plays a key role in the promotion of Augmentative and Alternative Communication in educational fields. ISAAC is a membership organisation based in Toronto, Canada, and was founded in 1983. Its mission is to create global awareness about the interests of people with complex communication needs, to provide information and to promote innovative concepts and research approaches (see ISAAC 2011–2018). Since 1990, there has also been an ISAAC branch in German-speaking countries and regions, namely the *Society for Augmentative and Alternative Communication eV* (*Gesellschaft für Unterstützte Kommunikation e.V.*). The society hosts regional as well as national conferences and issues the *Handbook of Augmentative and Alternative Communication* (*Handbuch Unterstützte Kommunikation)* as well as the journal *Augmentative and Alternative Communication* (*Unterstützte Kommunikation*) (see Gesellschaft für Unterstützte Kommunikation e.V. 2015).

It is important to differentiate the concept of Facilitated Communication (FC), developed by Australian author Rosemary Crossley, from the term Augmentative and Alternative Communication. Facilitated Communication refers to supported typing or supported written output: "In Facilitated Com-

munication there is always a communication partner and a facilitator who jointly operate communication aids. These communication aids are usually either alphabet boards, typewriters or computers, all of which allow for utterances in written language" (Nußbeck 2018: 239; English translation of the German original). The extent to which the facilitator influences the content during the production of a text is critically discussed in this approach (Janz/Klauß 2012).

2 Identifying the target audience and defining the methods

The following three examples illustrate the diversity of both the target audience and the specific methods of Augmentative and Alternative Communication:

Ms. S. lives in a facility for the disabled. During the day she attends a sheltered workshop for people with disabilities. Her motor skills and cognitive abilities are impaired. She communicates with her caregivers by uttering sounds and by reaching for objects and people. The educational assistants are often not able to understand Ms. S.'s physical signals, which they interpret as pre-intentional (unconscious). Instead, they attempt to support intentional (conscious) behaviour. In order to develop intentional behaviour, Ms. S. can use simple switches to turn electronic devices (e.g., music, fan) on and off. Thus, she learns about self-efficacy and the relationships between cause and effect.

Due to a gradually progressing form of motor-neuron disease (amyotrophic lateral sclerosis/ALS), well-known physicist Stephen Hawking (1942–2018) lost, among other things, the ability to communicate verbally. As an alternative, the physicist used a speech-generating device to communicate.

Jacob attends year four of a primary school. He was diagnosed with childhood autism and so far, he has not been able to communicate verbally. He

is able to express whether he agrees or disagrees through clear gestures. Furthermore, he possesses an age-appropriate ability to perceive speech. In order to communicate more complexly, also with his classmates, Jacob uses an analogue communication board with many symbols and phrases. He points at these symbols and phrases to ask or answer questions and to comment on situations. The complexity of the communication board is gradually expanded, also with the help of the classmates who can suggest new additions.

Thus, methods of Augmentative and Alternative Communication address a heterogeneous audience whose common ground is that their ability to communicate verbally is either permanently gone or temporarily impaired. Alternative methods of communication have varying functions. They are used

- to replace spoken language for individuals who are able to perceive speech normally,
- to acquire symbolic skills,
- to enhance the perception of speech,
- to supplement partially existing spoken language,
- to acquire the ability to read (see Lage 2016: 375 f.; English translation of the German original).

Limitations in the ability to communicate may be due to innate or acquired impairments and can have various causes, such as

- Cerebral palsy
- Autism spectrum disorders
- Developmental language delays
- Cognitive impairments
- Traumatic brain injury and stroke (e.g., resulting in aphasia)
- Neurological disorders
- Stroke
- Ataxia, dyspraxia,

- Temporary medical conditions such as the need for a tracheostomy tube
- … (see e.g., ISAAC 2011–2018)

The early years of developing Augmentative and Alternative Communication focused on an individual's communicative skills and saw the promotion of communication as a dyad, meaning a one-to-one relationship or individual support. In the past ten years, however, there has been an increasing focus on social surroundings, communication partners and situations (see Light/McNaughton 2014; Hömberg 2018) as well as on aspects such as bilingualism and multilingualism.

The German Gesellschaft für Unterstützte Kommunikation e.V. also relates the definition of the target audience directly to the social context as well as to matters of participation:

> "There are people who experience limitations regarding verbal communication with their surroundings due to innate or acquired impairments. Some of them have extensive disabilities in various areas of development, while others are only impaired in their communication with strangers – they are, however, understood by people they know and trust. Participating in society as well as leading an autonomous and self-determined life may be significantly limited for all of them. By using Augmentative and Alternative Communication, said people can considerably improve their communicative skills" (Gesellschaft für Unterstützte Kommunikation e.V. 2015).

In order to systematise Augmentative and Alternative Communication, we distinguish between unaided and aided AAC as well as between low-tech (non-electrical) and high-tech (electrical) communication aids in the case of aided AAC (see Kristen 2005; Tetzchner/Martinsen 2000).

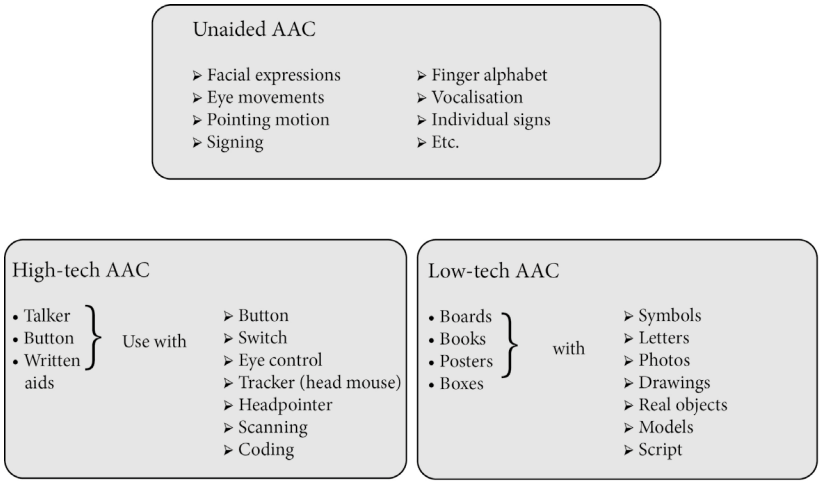

Figure 1: Overview of communication aids (Heidtmann 2010: 347; English translation of the German original)

Unaided AAC:

Unaided AAC includes gazes, body movements and posture, facial expressions, gestures, signs and sign language, sounds, remnants of spoken language as well as individual signals and signal systems. Thus, unaided AAC represents a wide range of forms, from very basal (e.g., body movement) to highly complex (sign language). In addition to German Sign Language, easier signing systems have been developed in the context of Augmentative and Alternative Communication, such as Sign Supported German which derives from German Sign Language. Etta Wilken developed another approach, namely so-called sign-supported communication: The signs used in sign-supported communication are also primarily components of German Sign Language, "but they are specifically chosen to be easy to use and as clear as possible to understand. Therefore, young children and people who are more severely impaired are able to learn and remember the signs more easily (…). Since both symbol systems – speech and signing – have similar cognitive requirements, signs facilitate speech development and enhance the mutual awareness between a child and their caregiver" (Wilken 2018: 77; English translation of the German original).

The fact that unaided AAC is independent of additional, external tools and that it can be used spontaneously is a major benefit. It is, however, a disadvantage that unaided AAC sets certain requirements for communication partners, such as motor and visual skills as well as the knowledge of sign language or the individual symbol systems. Furthermore, the basal systems of unaided AAC (e.g., glances, facial expressions) are not able to convey complex issues (see Heidtmann 2010: 347).

Aided AAC, low-tech and high-tech communication aids:
Low-tech communication aids used in aided AAC include various collections of symbols that can incorporate written language, real objects (reference objects, see Wagner 2007), pictures and images. Collections of symbols are, for example, designed as portable communication boards or folders (e.g., expandable ring binders) using standardised collections of symbols (e.g., Picture Communication System) or individually created pictures and images. With the help of these tools, the user may communicate a message through *direct or indirect selection*. Direct selection means, for example, that the user selects an image by directly pointing or looking at it. If the user does not possess the necessary motor skills to select a symbol directly or if the fixation of the user's gaze is not clear enough, symbols can also be chosen through indirect selection. In this case, the communication partner uses, for example, a finger to slide along the symbols of the communication board (so-called partner-assisted scanning) until the AAC user signals for the partner to stop, for example by uttering a sound or making a small movement.

This distinction between direct and indirect selection is also applicable to high-tech communication aids. The user of a simply structured speech-generating communicator can directly select images and symbols, for example by using a finger. Then the communicator produces the associated word using natural or synthesised speech output (e.g., "Go Talk"). Furthermore, the user can directly select symbols on a screen with the help of eye tracking: A camera tracks the movement of the eye, allowing the user to directly select images, symbols, letters or written language by fixating on them with their eyes. If the AAC user does not possess the necessary motor skills for direct selection, communicators can also enable indirect selection, for example, by using a cursor that successively moves along all symbols shown on a screen (scanning). The

AAC user stops the cursor when it reaches the appropriate symbol (e.g., by using a head or knee switch or by sucking on or exhaling into a small tube). To some extent, conventional computers with touch screens and especially tablet computers are alternatives to the special communicators mentioned before. They are increasingly utilised in Augmentative and Alternative Communication and have the advantage that they are not 'special' devices, but that everyone can generally use them, for example in school (see Lamers/Terfloth 2013) (to learn more about the conflicts between universal design and individual solutions see Womser-Hacker's article in this volume).

High-tech communication aids do not only include complex communicators, but also simple, individually usable switches. With these switches, the users are able to break circuits and thus switch electrical appliances on and off (e.g., "Power Link"). Furthermore, AAC users often utilise simple "communicators" that can play a previously recorded text (e.g., "BIGmack") or multiple short texts in a row if the user repeatedly presses the switch (e.g., "Step-by-Step").

In comparison to unaided AAC, the communication aids used in aided AAC have the disadvantage that users do not always carry such external tools around with them and that, in the case of electronic aids, they require power. Moreover, they can be quite expensive; but they also have many benefits. Through speech-generating communicators, users are able to overcome physical distance from their communication partners. Furthermore, communicators and computers offer the possibility to produce complex messages on the basis of various coding systems.

3 Communication development and participation

In order to appropriately apply methods of Augmentative and Alternative Communication, it is important to be able to evaluate the communicative skills of children, adolescents or adults (to learn more about diagnostics see Scholz/Wagner/Haag/Herale 2014; Kane 2018). Thus, making people with very profound cognitive impairments use different symbols (e.g., a picture of a ball to symbolise "play") may be inappropriate if they do not possess a recognisable understanding of symbols (yet).

After briefly describing the concept of communication development following Wilken (2018), the "participation model" (Beukelman/Mirenda 1998) is used to analyse specific situations and their communication barriers in order to establish a close link between the concepts of *development* and *participation*.

Starting with aspects related to the development of communication: Wilken (2018) analyses communication development of children until they reach the milestone of verbal communication when they are two years old. She distinguishes between 1) pre-intentional behaviour, 2) intentional behaviour, 3) conscious communication, 4) conventional communication, 5) symbolic communication and finally 6) verbal communication. The following table provides an overview of these six stages of communication development, connects each to a certain age and briefly describes them in terms of how the child and the communication partner behave.

1. Pre-intentional behaviour	
Child: shows activity (movements, crying, making sounds), sounds are expressed	Reference person: understands behaviour and sounds as "messages", same interpretation enables intentionality for the child
Disability changes activity	*Disability complicates interpretation*
2. Intentional behaviour (developmental age of about 5 months)	
Child: experiences in interactions lead to expectations, active co-creation of rituals, attention is still one-dimensional, differentiated vocalizations	Reference person: creates rituals, enables interrelated action in everyday situations, supports attention, promotes referential eye contact
Disability impairs cooperative behaviour	*Disability restricts joint actions*
3. Conscious communication (developmental age of about 9 months)	
Child: pays attention to things and partners, directs attention (eye contact), pointing and goal-directed behaviour, action-related vocalization	Reference person: responds verbally and with actions, comments on own and child's activity, shows and demonstrates
Disability affects attention and possibilities for action	*Disability affects joint activity and safe interpretation*

4. Conventional communication (developmental age of about 10 months)	
Child: conventional signals, rituals and gestures, declarative pointing, imitation of single sounds, sound duplications, protowords	Reference person: pointing and naming, situational and action-related language
Disability leads to discrepancies in the development, limited active influence and reduces the experience of competence	*Disability complicates the assessment of child competences and developmentally appropriate offers*
5. Symbolic communication (developmental age of about 13 months)	
Child: conventional gestures and facial expressions, single words	Reference person: reinforce, extend, support comprehension and repeating
Disability alters facial expressions and gestures, impairs the acquisition of language in a specific way	*Appropriate reinforcement for alternative forms of communication often difficult*
6. Verbal communication (developmental age of about 24 months)	
Child: several words are connected, building syntax and grammar, increasingly standardized articulation	Reference person: expands the child's expressions according to the intended meanings, reinforces and corrects false creation of rules
Disability impairs active linguistic influence, restricts language-bound cognitive processes	*Disability causes problems of the appropriate adjustment to the child's interests, questions and needs*

Table 1: Communication development according to Wilken (2018: 75 f.)

While the initial focus was on people with disabilities and their individual deficits in terms of communication, that focus was gradually and systemically expanded. The focus is no longer only on individuals and their specific means of expression, but rather on the fact that communicative *situations* are increasingly becoming the basis of methods in Augmentative and Alternative Communication (see Lage 2016: 375). While developmental diagnostics and support remain necessary and useful, they are supplemented by a stronger focus on possibilities of participating in specific everyday situations. With their participation model, Beukelman/Mirenda (1998) have crucially contributed to the establishment of this perspective, which focuses on specific situations and barriers.

The focus on a person's participation in concrete situations of various areas of life forms the basis of the *participation model*: "It is about how a person with communication impairments is able to participate in everyday situations and activities of different areas of life compared to peers without disabilities" (Antener 2012: 01-024-001; English translation of the German original).

Using the example of Inge, a pupil who cannot talk and goes to an inclusive primary school, and following Braun (2018: 156 ff.), the steps explained in the participation model will be described below.

Creating a list of activities:
As a first step, a list of all the activities in the school day is created and one specific activity is described more precisely: 1) morning circle, 2) local history and environment, 3) break, 4) maths, 5) lunch break, 6) sport, 7) after school club.

One of the list's activities is chosen and described: During the morning circle, 1) the pupils greet each other, 2) they choose a song to sing, 3) they talk about what they did at the weekend and 4) they end the morning circle.

Evaluating the participation possibilities of Inge's classmates:
The classmates each greet the person sitting next to them and wish each other a good morning. They suggest songs and talk about what they did at the weekend. They conclude the morning circle with a verbal ritual.

Evaluating Inge's participation possibilities:
Inge takes part in the greeting ritual using hand signals, but she does not greet her classmates verbally. She can participate in the selection of a song using yes-no-questions. Thus, the choice is limited to what is offered verbally. Inge does not talk about the weekend herself, but listens to what is read from the notebook that her parents use to briefly document what she did over the weekend. She again uses her hand to participate in the conclusion of the morning circle.

On the basis of this evaluation of participation possibilities, the next step identifies *individual barriers* and *opportunity barriers.*

Individual barriers primarily refer to the current skills of a person using Augmentative and Alternative Communication. Opportunity barriers describe the (limiting) circumstances (e.g., related to politics, knowledge or attitude) that have to be anticipated. In Inge's case, her individual barriers arise from the fact that, due to her impaired motor skills, she cannot communicate through signs and direct selection is only possible for her through large-format aids. Opportunity barriers are reflected in the limited availability of high-tech communication aids in the school as well as in the teacher's lack of experience with AAC. Still following Braun (2018), it is now possible to formulate first "ideas for intervention," for example: Inge should have the opportunity to actively greet her classmates (BIGmack), to choose songs autonomously (a communication board with pictures/symbols for different songs), to talk about the weekend by herself (creating, for example, communication boards depicting people and activities) as well as to actively conclude the morning circle.

Participating in the activities of the school day can lead to the perception of communication as a meaningful tool and to the development of motives for communicative action. It is thus not a question of isolated functional training, but of education. The following chapter on Augmentative and Alternative Communication in the case of people with so-called severe and multiple disabilities also places a special emphasis on this aspect.

4 Augmentative and Alternative Communication in the case of severe disabilities

In the early years of Augmentative and Alternative Communication, the development of various low-tech and high-tech communication aids did not focus on people with severe and multiple disabilities. Currently, people who have not (yet) displayed intentional behaviour and who are not able to communicate through simple symbols are only very slowly being considered in the discourse on Augmentative and Alternative Communication (see Hennig 2011: 274). In general, the field of (special) education has only begun addressing people with severe disabilities in more recent years. For example,

the "old" German federal states (the 10 states of former West Germany) did not establish or implement compulsory education for children and adolescents with severe disabilities until the 1980s. In German-speaking countries, the concept of basal stimulation (1996), developed by Andreas Fröhlich at the end of the 1970s, is considered to be the first concept of support for people with motor and cognitive impairments. Fröhlich's approach refers to findings from the fields of developmental psychology, physiotherapy as well as physiology of the brain. He classifies the target audience of his concept as "severely disabled" and thereby always refers to "complex impairments of the whole person concerning all their means of expression and experiences. Emotional, cognitive and physical, but also social and communicative skills are significantly impaired or modified" (Fröhlich 1996: 11; English translation of the German original).

Finally, Fröhlich puts communication at the centre of the development model that he created together with Ursula Haupt (see ibid., 50). Basal stimulation aims to initiate processes of perception through a variety of stimuli and distinguishes visual, tactile, vibratory, thermal and somatic communication as well as communication related to the senses of taste and smell (see ibid., 51 f.). At about the same time, Winfried Mall developed the concept of basic communication, which is based on Gestalt psychological references, primarily addressing people with a so-called severe cognitive disability (see Mall 1998). Both concepts share common aspects with the current approach of *Intensive Interaction* (see Hewett 2018) and can be seen as important driving forces for the later inclusion of people with severe disabilities in the development of methods and measures of Augmentative and Alternative Communication – basal stimulation because it emphasises a "somatic dialogue" and basic communication because of its "cycle of primary communication" (Mall 1998: 3; see also "pre-reflexive dialogue" in Fornefeld 1989). Mall visualises this cycle as follows:

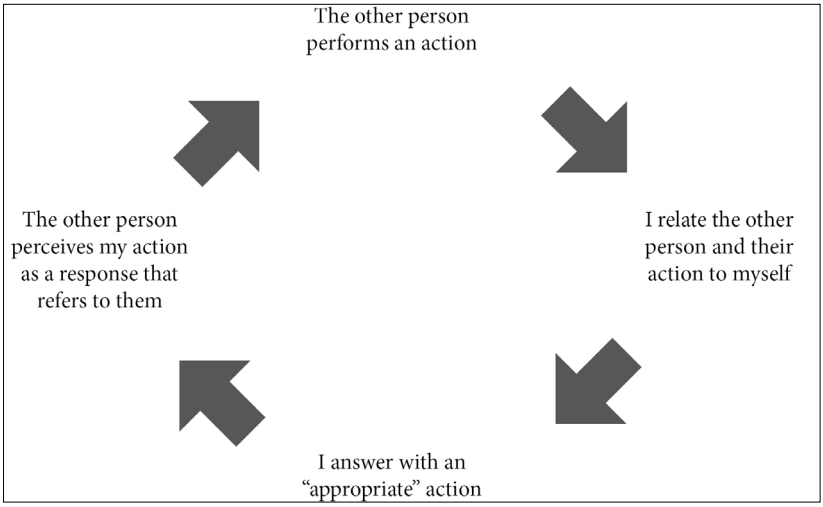

Figure 2: The cycle of primary communication (according to Mall 1998: 34; English translation of the German original)

This primary communication describes the attempt to transform pre-intentional behaviour into intentional behaviour and conscious communication.

In the example mentioned above, Ms. S. does not yet demonstrate conscious behaviour or rather, outsiders are not able to identify her gazes and movements as conscious communication (e.g., consciously pointing at an object in order to make a request). Conscious communication is accompanied by the gradual expansion of triangulation, the referential gaze and divided attention (see Hennig 2011: 276). This means, for example, being able to refer to a third party (e.g., a cup of coffee on the table) while a communication partner is present and to express the wish to take a sip of coffee: "The milestone of triangulation frequently becomes a boundary stone of communicative development for people with severe disabilities" (Hennig 2011: 276; English translation of the German original).

Ms. S.'s behaviour is located primarily in the field of pre-intentional behaviour. The initial developmental aim is to create the foundations for the development of intentional behaviour; in other words, to enable the experience of being able to achieve something by oneself and to affect the environment by

one's own actions. For this purpose, the previously mentioned simple high-tech communication aids (PowerLink, BIGmack, …) can be used. A switch (PowerLink) can be attached to a wheelchair's headrest, for example. Whenever Ms. S. operates the switch with her head, for example, the CD player is turned on and starts playing her favourite music. When she operates the switch again, the music is turned off. Even if Ms. S. initially only operates the switch accidentally instead of intentionally, if she keeps repeating this action, she is able to experience that her own actions have an effect. Thus, it is possible for her to realise that it makes sense to communicate. However, Hennig (2011) draws attention to the fact that it is also possible to experience similar cause and effect relationships in terms of contingency through playful forms of social interactions. Therefore, the added value of using technical devices on this basal level of communication should not be overrated (see ibid., 289). Furthermore, people with severe disabilities demonstrably prefer social effects over other effects, making it reasonable to use simple speech-generating keys, especially in order to initiate social processes (calling someone, catching someone's attention…). Thus, the users receive social feedback and experience self-efficacy (see ibid.).

In connection with Paul Watzlawick, the field of special education, where the concept of Augmentative and Alternative Communication was developed and further differentiated during the last approximately 25 years, has favoured a broad understanding of communication. Following the first axiom "*One cannot* not *communicate*" (Watzlawick/Beavin/Jackson 1996: 53, emphasis in original; English translation of the German original), the equation of behaviour and communication offers the possibility of an inclusive understanding of communication that ultimately enables everyone to participate in communication. Due to this optimistic interpretation, it was temporarily forgotten that communication also requires reasons, occasions and content. At the turn of the century, Klauß (2002) had already drawn attention to the fact that the first axiom of Watzlawick's communication theory resembled a "dogma of special education". Considering communication to be without precondition and equating it to any behaviour entails the danger of neglecting the educational needs for communication: According to Klauß, if everyone constantly communicates even without precondition, communication basically does not have to be supported. It is thus only a functional problem: The pedagogical communication

partner would then only have to learn to understand the other person's constant messages and provide the missing tools (technologies). This would, however, disregard significant conditions of communication, namely that a person 1) has something to communicate (communication requires content), 2) wants to communicate (communication requires a reason), 3) is able to communicate (communication requires a channel and a comprehensible sign system) and 4) needs a communication partner who is interested in the person's message and is able to understand it (see Klauß 2002). Therefore, dialogically establishing a relationship (e.g., in terms of "primary communication") is a precondition for communication. However, communication also has to offer opportunities to develop personal needs, requirements and preferences. In the context of severe disabilities, communication and education are closely linked, since, here, the emphasis is on "identifying the simplest forms of symbol formation as such and recognising them as a part of education" (Ackermann 2010: 234; English translation of the German original), in their cognitive as well as in their affective-emotional dimension (see ibid.: 235).

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Uta Benner and Annika Herrmann

Sign language interpreting

1 Introduction

Sign language interpreting is currently experiencing an unprecedented level of attention even though the profession has already been taught for more than 30 years. The reasons for this development include various different legal, scientific as well as cultural aspects. The need for sign language interpreters continues to grow not least due to the German Act on Equal Opportunities for Persons with Disabilities (Behindertengleichstellungsgesetz, BGG) and the UN Convention on the Rights of Persons with Disabilities (CRPD). In addition, the scientific approach to sign language interpreting is becoming increasingly important from the perspective of translation studies, especially in international contexts. Finally, cultural influences and the associated development of a situational understanding of the role of an interpreter are essential. In this article, we will provide an overview of the topic of sign language interpreting.

2 Sign languages and sign language communities

Sign languages are natural and complex languages with their own grammars. They are country-specific and, within a country, sometimes have own dialectal variants. Therefore, it is impossible to refer to *the* sign language, but instead to different sign languages worldwide. They are produced and perceived in a visual-manual modality, i.e. they are articulated with hands, body, head and facial expressions and perceived with the eyes (cf. i.a. Bellugi/Fischer 1972). Spoken and sign languages differ in language-specific areas, but not cognitively since they harness the same neurological basis (cf. i.a. Klima/Bellugi 1979, Poizner et al. 1987). If we look at different sign languages, we can see that

they differ greatly from one another on various levels; for example in their lexis, as in the individual signs, and in word order, i.e. in relation to sentence structure (cf. e.g. Woll 1983, Meier 2002, Perniss et al. 2007). In other areas, such as morphology, i.e. the internal structure of a sign, there are conversely also some common aspects across all sign languages (cf. e.g. Wilbur 2000, Aronoff et al. 2005).

2.1 German Sign Language (DGS)

German Sign Language (DGS) is the main language of deaf people in Germany and is shared by members within the deaf communities. Even though the age of different sign languages cannot be completely reconstructed due to the lack of a written form and a scarcity of historical documents, there is the hypothesis that sign languages have existed since before spoken languages (cf. Armstrong et al., Armstrong/Wilcox 2003), it is generally assumed that sign languages in the documented and later in the educational sense are between 300 and 400 years old. In Germany, scientific research on DGS began in the 1970s and 1980s (cf. Prillwitz 1986, 1988). DGS is a linguistically autonomous language with a complex grammar and basically independent of spoken German (cf. Happ/Vorköper 2006, Papaspyrou et al. 2008, Eichmann et al. 2012). Since 2002, DGS has been officially recognised as an independent language in the German Act on Equal Opportunities for Persons with Disabilities (BGG § 6) (see Chapter 5.2). In Austria and the German-speaking part of Switzerland, other sign languages specific to those countries are used: Austrian Sign Language (Österreichische Gebärdensprache, ÖGS) and Swiss-German Sign Language (Deutschschweizer Gebärdensprache, DSGS) (cf. Skant et al. 2002, Boyes Braem 1995).

2.2 Sign language communities and sign language culture

Sign language communities define themselves primarily through a common culture, which is essentially shaped by the sign languages of the chosen visual-gestural modality. The community as a whole includes deaf, hard-of-hearing and hearing sign language users, although different signers can be distinguished and sub-categorised: for example, deaf native speakers, deaf late learners, people who are hard-of-hearing, children of deaf adults (CODAs),

social workers, interpreters, other DGS users, etc. The constituting characteristic of the German Sign Language community and the sign language culture, however, always remains DGS and visual communication. Without going into the details of sign language culture in this context, it should be mentioned here that in Germany, there are cultural achievements in the field of sign language history, art, theatre, poetry, humour etc. This culture enables a strong identification through specific conventions, which are passed down from generation to generation (cf. i.a. KUGG Bundesvereinigung zur Kultur und Geschichte Gehörloser e.V., Vogel 2010).

3 Translation studies and sign language interpreting

Although translation studies is a rather young discipline, translation and interpreting are principally an age-old topic. Translation is always necessary when people of different languages and cultures meet. If communication partners themselves do not have the ability to respond in the language of the other partner, language mediators need to be brought in. Since this phenomenon is a very old one, it is assumed that translation is one of the oldest topics and professions in human history (cf. Černý 2002: 3, Woodsworth 2006: 39). However, this does not apply to the same extent to research thereof. Translation studies as a discipline has only become established in the last decades (Snell-Hornby 2006: 37 f.), even though there has been repeated discourse on translation-related topics throughout history (such as Luther's epistle on interpreting or Goethe's theoretical discourse on various forms of translation) (cf. Woodsworth 2006: 41 f.).

Sign language interpreting is also considered a rather young discipline. In Germany, the professionalisation and development of a professional image only began in the 1970s (cf. Hillert/Leven 2012: 425). But even here, the topics of deafness and sign language have historically been known for a very long time. After an initial boom in the 18th century with the first instances of sign language research, sign languages were still barely tolerated from the end of the 19th century onwards. Sign languages were considered inferior and were

banned from public perception as far as possible. Only in the middle of the 20th century did scientific interest in sign languages reawaken (cf. Benner 2012: 151–156). Linguistic research on DGS was also conducted in Germany (cf. Prillwitz 1988). This was accompanied by an emancipation movement of deaf people, who demanded more and more rights of participation. In order to advocate for their interests, sign language interpreters were required. In the course of this development, first examinations and apprenticeships were initiated, which finally led to first academic degree courses (cf. Hillert/Leven 2012: 425).

From the perspective of translation theory, sign language interpreting differs only marginally from interpreting into spoken languages. However, the aspect of an additional language modality as well as the diverse fields and situations of application make an interesting contribution to translation studies.

3.1 Translation studies

The term "translation" stems from the Latin word *translatio*, which stands for transfer, translation or conversion, and has been used in the German-speaking academic context as a generic term for translating and interpreting since Otto Kade (cf. Snell-Hornby 2006: 37). While the terms "translating" and "interpreting" have been used rather synonymously in the last centuries, there has been a clear division of the terms in its German-speaking context since Kade (1968), because even if translating and interpreting are related disciplines, there are very significant differences. Nowadays, Kade's definition is uncontested among experts and as a result, translation is now considered to be the transfer (translation) of a fixed text. This feature causes further characteristics, such as a fixed text being permanently present meaning it can therefore be repeated as often as desired. In this way, the transfer from a source language into a target language, the actual translation, can be checked and corrected at any time. In interpreting, by contrast, the original product is offered only once, which means that the translation can only be checked to a limited extent and the ability to make corrections is also severely limited due to the lack of time (cf. Snell-Hornby 2006: 37). Nevertheless, the term 'translation studies' initially remained the "generic term for the science of translation and interpreting" (ibid: 38, English translation of the German original). In the meantime, however, the term "trans-

lation studies" has been established in the professional world and refers to an interdisciplinary approach to interpreting and translating (ibid.).

The challenge in the field of sign languages lies precisely in this terminological distinction. No universally used writing system has yet emerged, as these visual languages were long suppressed minority languages and still are today. Although there have been proposals for notation systems since the first research on sign languages, none of these systems have been used in everyday life by a majority of sign language users. Translation in the field of sign languages referred and still refers primarily to interpreting. Although technical innovations also permit permanent fixation of linguistic utterances, these are very difficult to correct. For this reason, there is no direct comparison to translations into written languages. In many cases, it is most likely to be a combination of interpreting and translating. In terms of translation theory, however, this phenomenon has hardly been researched to the present day.

In the field of interpreting studies, publications of the past years have shown that sign language interpreting has forged its way into the discipline (e.g., Gile 2009; Nicodemus/Swabey 2011). Research on sign language interpreting is being taken increasingly seriously while making an important contribution to knowledge acquisition within the discipline. One reason for this is that sign language interpreting occurs in almost all areas of life. This is not least due to the fact that a real reduction in the communication barriers of deaf people can be achieved almost exclusively through sign language interpreting. So it is not surprising that the website *Taubwissen (engl. Deaf Knowledge)* http://www.taubwissen.de – a collection of information about the lifeworld, history and culture of deaf people – locates this topic in the area of everyday life (cf. Taubwissen, 2008). From a translation theory perspective, the diversity of the fields of application as well as the diversity of the communication situations and participants offer interesting research topics. It is precisely the debate on these areas that has led to new role models and interpreting models (e.g. Cokely 1995; Dean/Pollard 2011; Llewellyn-Jones/Lee 2013).

The relationship with the customer is taken into account also in translation studies in general (cf. Gile 2009: 26 ff.), but this topic is much more controversial in sign language interpreting. The question of how sign languages can be cultivated and maintained as minority languages of quite small language

communities consistently arises. Sign languages are still learned by most users as first languages, but not necessarily as native languages. In addition, so far there have only been a few cases of sign language classes in schools. Even though most sign language interpreters learn the respective sign language as a second language, they have, in contrast to most deaf people, a well-founded language education. Nevertheless, there is often no possibility for them to immerse themselves completely in the language – there is no such thing as a deaf country (the starting situation is similar in many countries, see, for example, the comments of Napier et al. 2010: 5–6). Therefore, in some places within the sign language communities the term "Interpreter DGS" is used (cf. Hillert/Leven 2012: 451; English translation of the German original). There is also the question of the extent to which interpreters should participate and engage within the communities. Involvement seems to be generally desired, but the question remains at what point it is appropriate to draw a line between professional and private life. Within a small language community you will inevitably run into your customers if you want to interact within the community. Napier et al. (2010) describe the relationship between interpreters and the sign language communities as symbiotic. Both parties are dependent on each other: the interpreters to acquire linguistic and cultural skills and the members of the sign language communities for accessible communication (ibid. 9).

In the context of minority languages and a long history of oppression, questions of power also play a significant role. Often sign language interpreters are better trained than many of their deaf clients (fortunately, the number of extremely well trained deaf people has increased in recent years). In addition, there are dynamics within the communication situation and between the communication partners, which also often comprise aspects of power (cf. Hillert & Leven, 2012). These questions are being discussed more and more frequently in research on community interpreting in translation studies.

3.2 Types of sign language interpreting

Interpreting in itself is a highly complex task that requires a wide range of skills. Within the field of translation studies, the field of interpreting studies therefore deals specifically with the requirements for interpreting and analyses various aspects of interpreting. The requirements can also vary greatly depending on

the type of interpreting. In sign language interpreting, three types of interpreting are primarily applied: Consecutive interpreting, simultaneous interpreting and the so-called sight translation, which refers to a mixed form of translating and interpreting.

Simultaneous interpreting is certainly the most common type of interpreting within sign language interpreting. While simultaneous interpreting in spoken languages always requires additional technology, the different modalities of the languages involved in sign language interpreting permit a less complicated use of this type of interpreting. Among experts, simultaneous interpreting refers to the almost simultaneous transmission of the message. This means that output is continuously produced in both the source and target language. This type of interpreting therefore requires simultaneous listening and analysis as well as reproduction and monitoring of a message (Napier et al. 2010: 28; BDÜ n.d.). Various interpreting models also deal with the requirements for simultaneous interpreting (e.g. the Effort Model, cf. Gile 2009, the model for simultaneous conference interpretation according to Setton, cf. Setton 1999). Due to the high demands, two interpreters usually work together.

Although simultaneous interpreting plays the most important role in sign language interpreting, consecutive interpreting also has its place. Consecutive interpreting involves interpreting in sections. During the speaker's presentation of the message, the interpreter takes notes which then form the basis of the interpretation (cf. Andres 2002). In some interpreting situations, consecutive interpreting may be more appropriate and may contribute to the accuracy of the transmission. For example, Russel (2005: 151) reports that in court contexts, consecutive interpreting leads to more accurate translations. During interpreting situations, information is structured and weighted; therefore the message presented must be understood (cf. Andres 2002: 214). This includes the speaker's intention, which is easier to comprehend if entire sections are presented. Even though consecutive interpreting is used in sign language interpreting, notations are much less common here (Napier et al. 2010: 27). In sign languages, eye contact between sender and receiver plays an important role, which makes it difficult to take notes (ibid.).

Sight translation is also a common variant in sign language interpreting. Here "a written text is translated orally by the interpreter extemporaneously

– or after a minimal preparation time" (Viljanmaa 2012: 346). This type of interpreting is also occasionally used in sign language interpreting, when the text is read out loud and then interpreted into sign language. However, the terminology here is quite inconsistent. This is certainly also due to the fact that, according to Otto Kade's definition, sight translation is neither pure interpreting nor pure translating, but the fleeting transmission of a fixed text. In translation studies, however, this type is usually attributed to interpreting (ibid.). In the everyday working life of an interpreter, sight translation occurs in a variety of situations: when reading a manuscript or minutes and very often in a medical context when filling out forms or information sheets.

The choice of the type of interpreting depends largely on the communication situation and the needs of those involved.

3.3 Studying sign language interpreting

Soon after the establishment of part-time training courses for sign language interpreters, it became apparent that these were only suitable as post-qualifications for experienced interpreters. As a result, various interpreting study programmes were established in Germany from the 1990s onwards. In 1993/1994, the first sign language interpreting degree programme in Germany was established at the University of Hamburg. This was followed in 1997 by degree programmes at the Magdeburg-Stendal University of Applied Sciences as well as in 2000 at the University of Applied Sciences Zwickau and in 2003/2004 at the Humboldt University of Berlin (Hillert/Leven, 2012: 425). In 2015 the Landshut University of Applied Sciences launched a degree programme in Southern Germany and in 2017 the University of Cologne also included sign language interpreting in its programme. Sign language interpreting can be studied part-time at the Hochschule Fresenius University of Applied Sciences in Idstein. Most degree programmes offer sign language interpreting as a Bachelor's degree (Hamburg, Cologne, Landshut and Magdeburg). Occasionally, sign language interpreting is also offered as a consecutive Master's degree (Berlin, Idstein). The University of Applied Sciences in Zwickau offers sign language interpreting as a diploma degree. In addition, the University of Hamburg and the University of Applied Sciences in Magdeburg offer a specialised Master's degree based on the Bachelor's degree.

The allocation of the degree programmes also seems problematic at many universities. Thus, still none of the degree programmes are offered at institutions that also train interpreters of spoken languages. Overall, all degree programmes are faced with the challenge of having to develop expertise in interpreting within a short period of time. The disadvantage here is that sign language cannot usually be acquired as a foreign language at school. Most of the first-year students therefore have either no or very few language skills. Since interpreting is a highly complex task that requires diverse and differentiated skills, first-year students need a quick grasp, a high degree of reflection capacity as well as a willingness to reflect, flexibility, resilience, mental and physical stability and openness. In addition, a strong interest in the culture and communities of deaf people as well as the joy of learning a foreign language are indispensable.

Since language and cultural skills as well as interpreting skills have to be acquired within a short period of time, the studies are usually very time-consuming. In addition to attending the courses, students are expected to work hard on their own and to complete a lot of individual training.

4 The professional sign language interpreter

The goal of most sign language interpreters is to work as freelancers. However, there are also some possibilities for permanent employment in academic or institutional establishments such as counselling centres, etc. Both fields have their own requirements and special features in relation to the different needs and competences of both the interpreter and the client.

For freelance interpreters, there are various national sign language interpreting centres that organise and forward the distribution of jobs. Regional associations for the deaf and some professional associations also offer the services of sign language interpreters. In most cases, these lists are confined to federal state borders, are not yet organised on a nationwide basis and are rarely adapted to the specific needs of customers. Career entry in the transition from training and internships to everyday working life is often characterised by challenges. In this regard, a close interlocking of training institutions and professional associations is desirable in order to adapt and link needs and

offers. In everyday life, the need for sign language interpreters is still very high and the order situation is usually good. What is essential is good teamwork with the so-called co-interpreter and a sustainable, objective and fair feedback culture (cf. Werther 2015), which is still not applied regularly in a productive way. Ongoing further training and, if necessary, specialisations are essential for the professional profile in the field of sign language interpreting. They are usually accomplished on an initiative basis and are sometimes mandatory and subject to quality control (see Chapter 4.4).

4.1 Hearing and deaf sign language interpreters

Currently, all Bachelor's and Master's degree courses in Germany that train sign language interpreters are designed for hearing sign language interpreters. The working languages are DGS and German and, depending on the training, also DGS, German and English. Training as a deaf sign language interpreter (Tauber Gebärdensprachdolmetscher, tGSD) has so far been offered in Hamburg as a part-time training course, which uses university module structures to prepare students for the state examination at the Centre for Teacher Training (Amt für Lehrerbildung, AfL) in Darmstadt (cf. Mitterhuber 2016). There are deaf sign language interpreters who interpret between two sign languages (for example, DGS and Turkish Sign Language (Türk İşaret Dili, TID)), interpreters who interpret between DGS and German Written Language and also interpreters who focus on both directions, for example, DGS and International Sign (IS) (cf. also Boudreault 2005 on the topic of deaf interpreters in general). After the state examination, deaf sign language interpreters receive the certificate to work as an interpreter. The tGSD are centrally organised in a professional association of deaf sign language interpreters called Berufsverband der tauben Gebärdensprachdolmetscher e.V., TGSD. Especially interesting in the current context of accessible communication is team interpreting in a hearing and deaf GSD team, for example, at international meetings (cf. Bentley-Sassama/Dawson 2012). For these different constellations and settings, in which hearing and deaf interpreters interpret simultaneously and depend on each other, a special feedback culture and reflection on teamwork is also essential in order to promote long-term cooperation and to achieve the best possible results for

clients in terms of both content and socio-cultural aspects (see also Chapter 4.4 on supervision).

4.2 Code of Professional Ethics (BEO)

The Code of Professional Ethics (Berufs- und Ehrenordnung, BEO) for sign language interpreters was first established in 1995 (cf. B.A.G. der GebärdensprachdolmetscherInnen 1997). The document, which recently was revised by the German Association of Sign Language Interpreters (Bundesverband der GebärdensprachdolmetscherInnen Deutschlands e.V., BGSD e.V.), contains guidelines, values and standards to which an interpreter, who is for example registered in an association, is committed in order to uphold the reputation of the profession. It deals with collegial and professional behaviour, order processing, behaviour towards customers and promoting trust between all parties involved. At the moment, there is no institutionalised establishment as a contact point for monitoring compliance with these directives, so that quality control is still solely subject to voluntary self-commitment. The BEO is intended for deaf and hearing sign language interpreters as well as freelancers, employees and trainees.

4.3 Interpreting associations

Since sign language interpreting was officially professionalised, various professional associations have emerged. Most of them operate regionally on the federal state level and date back to the beginnings of the professionalisation of this profession. It was in these associations, most of which were initially active as working groups, that the first codes of professional ethics were developed (see Chapter 4.2). Many of the regional organizations have joined the BGSD, which emerged in 1997 from the German Working Group of Sign Language Interpreters (Bundesarbeitsgemeinschaft der Gebärdensprachdolmetscher(innen)) (Hillert/Leven 2012: 426). In Germany, there is the singularity that, in addition to the BGSD e.V., there is another national association, the TGSD e.V., the professional representation of interests of deaf sign language interpreters (see Chapter 4.1). Both national associations are members of the European Forum of Sign Language Interpreters (EFSLI), which was founded in 1987. On an international level, the World Association of Sign Language Interpreters

(WASLI) takes care of the needs of sign language interpreters (an overview of the associations can be found at http://www.dgsd.de/berufsstand.html#2, see Braun et al. 2017).

The professional associations see it as their primary task to provide information about the profession and explain its social relevance. They work towards uniform regulations in the field of interpreting and are committed to regulated access to the profession, high-quality education and training, appropriate payment and working conditions.

These professional associations, but also the Federal Association of Interpreters and Translators (Bundesverband der Dolmetscher und Übersetzer e.V., BDÜ) and the Associated Interpreters and Translators in Northern Germany (Assoziierte Dolmetscher und Übersetzer, ADÜ), are therefore important contacts for funding agencies and associations for deaf people and advocate for a nationwide offer for sign language interpreters. In order to achieve these goals, the professional associations also influence decision-makers.

There is a great shortage of sign language interpreters in most regions of Germany. Many positions cannot be filled on the first attempt. Since most sign language interpreters are freelancers and usually overbooked, it can be difficult to find interpreters in emergency situations. Some professional associations have established an emergency stand-by service for this purpose on their own initiative (for example, the BGSD Bayern e.V. (BGSD Bayern n.d.)).

4.4 Further education and supervision

Dean and Pollard (2013: XIII–XIV) also describe interpreting as a *practice profession*. This means that experience and training are an important aspect of professional practice. Thus, the acquisition of an (academic) degree is not the end of the education of sign language interpreters but rather the beginning. Constant training is therefore a fundamental element for sign language interpreters. Hence, many professional associations offer further education for their members. Further education is also obligatory in some associations. The way associations handle this obligation may vary. In some professional associations, non-fulfilment leads to being erased from relevant lists through which interpreters can be booked, whereas other associations award the interpreters with a quality certificate for fulfilling this obligation.

Sign language interpreters are exposed to high levels of stress in their professional practice and are often assigned to work under difficult communicative circumstances. In the last few years, the awareness that working interpreters have to take care of their physical and psychological health during professional practice has increased. In the process, supervision proved to be a suitable instrument to minimise one's own load and to reflect on one's own work in a safe framework in order to improve it (cf. Chase/Omoyele 2017; De Beer/Bruns-Heij 2017). Offers of supervision appear only occasionally at the moment. Furthermore, the knowledge about the relevance of supervision remains marginal both for sign language interpreters as well as for the sign language communities. There is also a need for further increased clarification in this field (cf. Benner/Böhm 2017).

5 Accessible communication for deaf and hard-of-hearing people

5.1 Recognition of DGS

It has already been mentioned in Chapter 2.1 that DGS was recognised as an official language in Germany in 2002 in the context of the German Act on Equal Opportunities for Persons with Disabilities (BGG). Various linguistic and neuroscientific studies since the 1960s have gradually documented that sign languages are complex and independent languages (i.a. Stokoe 1960, Poizner et al. 1987, Huber/Klann 2005, Campell et al. 2008). The linguistic and neurological body of evidence is thereby clear as well as the legal foundation for DGS. However, an official recognition of DGS as a minority language in Germany has not yet taken place.

5.2 German Act on Equal Opportunities for Persons with Disabilities (BGG)

The German Act on Equal Opportunities for Persons with Disabilities (BGG) came into force in Germany in 2002 (for the legal situation in the field of accessible communication see the contribution of Lang in this volume). The BGG is meant to ensure the equal and self-determined participation of people

with disabilities in society. In the context of this act, German Sign Language is officially recognised as an independent language in Section 6. At the same time, the right for suitable communication aids, i.e. sign language interpreters, is found in Section 9. Thus, deaf people have the right to accessible communication in their everyday life, education and professional practice and can demand this from the respective responsible institutions. This application is still linked to great efforts but it has led to enormous progress in the field of equality for deaf people in recent years. Nevertheless, coverage of the need for specially trained interpreters in different professional fields is not always financially and professionally viable. For the equal participation of all people in our society, further active commitment to legal and societal change is needed.

5.3 UN Convention on the Rights of Persons with Disabilities (CRPD)

The Convention on the Rights of Persons with Disabilities (CRPD) was passed by the General Assembly of the United Nations (UN) at the end of 2006 and came into force in May 2008 (see the contribution of Lang in this volume). It includes the affirmation of general human rights as well as specific regulations about the human rights of people with disabilities. Article 21 deals with the right to freedom of opinion and expression, regardless of the form of communication. The right to use sign language is explicitly stated in Article 21 (also Braille and supplementary communicative forms are mentioned there). The costs thereof are borne by the public authorities. Thus, a framework on the entitlement to sign language interpreters was defined at the level of the UN.

5.4 Accessible communication and sign language interpreting in daily life, education, work, academic and international contexts

Deaf people are confronted with communication barriers time and again in their everyday life. The availability of sign language interpreters contributes to the reduction of these barriers in many areas with the assignments of sign language interpreters being very diverse. Their work covers the entire spectrum of human life: whether it is telephone interpreting for daily errands, doctor's appointments, parent-teacher meetings or team meetings – sign lan-

guage interpreters contribute to accessible communication in all these areas. In recent years, communicative barriers were reduced in particular regarding professional life with career options for deaf people increasing. Sign language interpreters are therefore a part of the daily life of deaf people. This is often very different for hearing communication partners. Many of them are not familiar with the subject of interpreting (see Napier et al. 2010: 9). Doubts and fears must therefore first be reduced.

Interpreting in an academic context has increased as well in the last years. More and more deaf people are academically active and use interpreters for their academic work. This also includes participation at international conferences and giving speeches. These contexts represent a special challenge, since terminological knowledge and a second foreign language (mostly English) are necessary. Consequently, additional qualifications are always a necessity in these kinds of contexts. Since such offers barely exist, many deaf professionals take these further qualifications into their own hands (see speeches of deaf professionals in Germany, e.g. in the STEM-sector). The development of programmes for the coordination of professional deaf customers and specialised interpreters constitutes a desideratum (see Hauser et al. 2015 on the subject of *Designated Interpreters*).

5.5 Responsibilities for accessible communication with sign language interpreters (social welfare offices, integration offices, companies, schools, universities etc.)

Another obstacle along the road to accessible communication is that deaf people have to ensure secured communication in most circumstances. Most of the time, it is their own responsibility to look for sign language interpreters for upcoming appointments. This responsibility can also be shouldered by public agencies or companies. The task of looking for a sign language interpreter however presents a burdensome challenge for deaf students or parents of deaf children going to an inclusive school. The task of organising the appointments is also commonly accompanied by dealing with the expenses. For this purpose, it is necessary to submit applications and statements about specific needs. New concepts are necessary for accessible communication in society. These concepts

have to demonstrate how to provide sign language interpreters without a great deal of effort.

5.6 Challenges of interpreting for special groups (e.g., children, elderly people, refugees)

Additional special requirements when interpreting occur mainly while interacting with multiple minorities (cf. Leigh 2012), e.g., deaf children, elderly people and refugees. In these situations, particular language and social skills are needed as well as respective experience and a special situational sensitivity. Current research work of students for final theses and international projects deal with e.g. the challenges of interpreters when working with children going to an inclusive school or the language use of deaf elderly people, who often tend to use a special mixed form of speech, Signed German (Lautsprachbegleitende Gebärden, LBG) and DGS due to oral education. During the BEO conference in January 2018 in Berlin, there was a discussion on establishing and recording complementary behaviour guidelines as an addition to the general BEO dealing with each respective group.

6 Summary: Diversity as an opportunity

Sign language interpreting is an officially recognised field of work that boasts a tremendous number of requests due to the currently large need. There are systematic educational opportunities for future sign language interpreters throughout Germany as well as degree programmes, appropriate associations and various paths to specialisation. Sign language interpreting is both a cognitive and a social-communicative challenge depending on the nature of the interpreting mode (simultaneous, consecutive, sight), the particular job requirements during different situations and the respective customers. Laws and frame-setting regulations concerning the right of using sign language as a means of communication (BGG, UN Convention) make the social participation of deaf people in Germany possible through deaf and hearing sign language interpreters. Consequently, the diverse competences and socially relevant qualifications of deaf people become evident. A major German but

also international network, standardised directives and a constructive feedback and supervision culture contribute to accessible communication within the sign language community.

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Conchita Otero Moreno

Community interpreting as a means to overcoming communication barriers for people with German as a second language: Areas of application, requirements, professionalisation

1 Introduction

In Germany today, we cannot deny that we are living in a migration society with thousands of migrants facing major integration difficulties due to existing language barriers. Although the German Immigration Act of 2005 provides different mechanisms to improve the active integration of newly arrived immigrants, with all of these mechanisms being practical and necessary, they nonetheless only become effective in the longer term (integration and language courses). However, the act does not contain any offers that immediately provide support or help to eliminate the language barriers that these population groups with German as a foreign or second language are confronted with in everyday situations. Texts from the public services and administration sector such as applications or forms contain communication barriers that are hard to overcome, especially shortly after arrival in Germany (see the article by Rink in this volume). The communication barriers in combination with the lack of cultural knowledge can only be reduced after many years of living in the country as well as after the migrants have had intensive contact with the German language and culture. Furthermore, many studies in migration linguistics have shown that a certain and often large portion of the migrants follow the acculturation strategy of separation and do not integrate linguistically or culturally in their host country. This can be observed in all immigrant societies and in different magnitudes (Estévez Grossi 2018).

With this knowledge and given the fact that in the last years more refugees and migrants from different countries have come to Germany than in previ-

ous years, the state now has to deal with an immense organisational challenge regarding language hurdles for migrants. Even though language and orientation courses are offered, graduates of these courses still find themselves not directly able to linguistically cope with all the different kinds of situations they are confronted with. The German Federal Office for Migration and Refugees (BAMF) explains in its "Report on Integration Course Figures for the Year 2017" that only about half of the participants of these integration courses pass the exam at language level B1 (BAMF 2017). However, it still remains to be seen whether migrants who pass this exam are fully able to communicate in official administrative situations. In these specific interaction situations, for example communicating with German authorities, language mediators are needed to translate or interpret written or oral communication in order to ensure a successful interaction. If there are no suitable language mediators or interpreters (used synonymously in this chapter in the interest of simplification) for language combinations that so far have not been needed frequently but which now show a disproportionately high demand (e.g. Arabic, Pashto, etc.), a practical solution usually needs to be found at short notice. In Germany, there is already a high number of refugees and migrants who have, due to the length of their stay in Germany, a good understanding of the German language and also attended language and integration courses. They represent a considerable potential that could be harnessed for these tasks if they are trained specifically for these language mediating situations. Due to the lack of interpreters in specific language combinations, it is becoming increasingly common that non-professional volunteer language mediators are hired as interpreters between German authorities and foreign citizens.

Both groups – professional and non-professional interpreters – need the knowledge and skills that are best acquired through professional training in order to work successfully. In addition to the already established translation and interpreting university programmes, which have existed at several German universities for decades, it is therefore necessary to develop and implement targeted, selective and workable solutions that have to be designed to meet the respective needs. Since the curricular processes at universities as well as other public educational institutions are long and complex, given the current political developments it is the task of the affected municipalities and other institutions

to find remedies and provide short-term alternative education suggestions in order to address this unique situation.

In this chapter, the term "Community Interpreting" will be initially explained in the context of alternative, adjacent and competing terminology. A community interpreter's activities and field of work will be defined in more detail in contrast to other types of interpreting. The next step is to present the areas and fields of applications of community interpreting focusing on communication with authorities. Finally, this chapter focuses on the importance of the professionalisation of interpreters and various ways to achieve this goal.

2 Community Interpreting: A Definition

The terms "translation" and "interpreting" have been in use since ancient times. In recent years, however, the fields of activity of translators and interpreters have undergone major changes, as have the many different terms used to describe them. For the subject area described here, these include the following:

> conference interpreting, community interpreting, court interpreting, consecutive interpreting, interpreting for public services and authorities, bilateral interpreting, social interpreting, language mediation, local interpreting, liaison interpreting, intercultural translation, business interpreting, dialogue interpreting, cultural interpreting, contact interpreting, public service interpreting, ad hoc interpreting, language and integration mediation, cultural mediation, hospital interpreting, healthcare interpreting, escort interpreting, *retour* interpreting, delegation interpreting, escort and liaison interpreting, media interpreting, telephone interpreting, speech-to-text interpreting, whispered interpreting, sign language interpreting …

Other terms could also be added to this list. The fields of work sometimes specifically mentioned in these terms (e.g. hospitals, courts, business, conferences, authorities) allow for conclusions about the context in which this type

of interpreting activity is performed. For example, a conference interpreter will primarily interpret at international conferences or congresses, while a court interpreter will interpret at a trial with foreign witnesses or defendants, etc. Other terms refer to the way in which an interpretation is provided (e.g. ad hoc, return, bilateral, consecutive).

However, there is general agreement on the target group for this type of interpreting:

> Community Interpreting enables people who are not fluent speakers of the official language(s) of the country to communicate with the providers of public services so as to facilitate full and equal access to legal, health, education, government, and social services. (Carr et al. 1995, quoted in Mikkelson 1996)

Community Interpreting is a relatively new discipline within the field of Translation Studies, to which the research community has only been devoting increasing attention since the 1990s (for a comprehensive overview, see Estévez Grossi 2018). The beginning of scientific engagement with community interpreting can be dated back to 1995, the year when the first conference of *The Critical Link* was held in Canada (see Pöchhacker 2004: 41–42).

Bowen (1998: 319; English translation of the German original) defines community interpreting as "the interpretation for individuals or small groups (families) […], mostly immigrants, refugees or migrant workers, for communication with authorities and social welfare offices, and at schools, in health sectors, etc. of the host state". The term was coined by a working group of the Institute of Linguists in London and was created following the expression *community work*, which is used in the USA for different services provided by laypeople (cf. Bowen 1998: 319). However, different countries use different names for this phenomenon, which vary considerably in their conceptual scope. This is why in an English-speaking area it is more common to come across terms such as *community interpreting, cultural interpreting, ad hoc interpreting, contact interpreting, public service interpreting, dialogue interpreting, liaison interpreting, escort interpreting, legal interpreting, medical interpreting*, etc. (cf. Gentile et al. 1996: 110; Roberts 1997: 8). In Scandinavia, we find

terms such as *contact interpreting* or *dialogue interpreting* (Wadensjö 1998) that interestingly include court interpreting. In Spain, there are terms like *interpretación social, interpretación comunitaria* and *interpretación en los servicios públicos,* with the last term (interpretación en los servicios públicos) being the one to prevail in the academic field (cf. Abril 2006: 24). The situation in German-speaking countries is somewhat more complex in this respect. In addition to Community Interpreting, the term "official interpreting" is also used in Germany, which does not only include interpreting in social institutions, but also interpreting in health and educational institutions. In Austria, on the other hand, the main term used in this context is "municipal interpreting", a term proposed by Pöchhacker and now standardised (Pöchhacker 2000).

In addition, the terms "language mediation" and "cultural mediation" are defined and used differently, depending on the author or the subject. Language mediation is often considered to be a superordinate term of inter-lingual translation and interpreting (Estévez Grossi 2018: 61). On the other hand, cultural mediation takes into account the sociocultural differences between the cultures concerned and intercultural communication. This way cultural misunderstandings can be clarified. When it comes to the term "mediation", especially in the field of Community Interpreting, the focus of the person carrying out the language and cultural mediation is placed on helping to resolve conflicts (cf. Pöchhacker 2008: 18). In other countries, such as Italy, the professional titles and the mediator's or interpreter's tasks are strictly separated from each other and precisely defined. Switzerland uses the term "intercultural translation". Here again, the focus is on intercultural communication and thus on linguistic mediation between different cultures; on the other hand, "translating" is also intended to bring the written form of communication to the sight, since interpreters working in the various institutions very often have to translate written documents spontaneously (impromptu).

This variety of terms results in inconsistent usage of the terms for this form of language mediation. As Ozolins (2010: 200 ff.) notes, this is by no means a trivial problem. The terminological diversity should rather be seen as an expression of the efforts to define this discipline and the tasks associated with it more precisely and to differentiate it from related fields. No consensus has yet

been reached on this matter. However, the search for "unity within diversity" (Pöchhacker 1999: 127; English translation of the German original) should not concentrate on the terminology problem alone. It is rather a desideratum to gain insights into the professional profile and the job description as well as the precise determination of requirements for professionalisation.

However, in order to advance this professionalisation, there must be at least a basic consensus on what constitutes community interpreting's activity and how it can at least be approximately defined. For this purpose, the inherent characteristics of community interpreting have to be characterised and systematised so that educational and professional goals can be clearly formulated and quality standards can be defined. One of the main characteristics of community interpreting is its interdisciplinary nature. Accordingly, every linguistic mediation action is also to be understood as a complex socio-communicative interaction which in no way can be examined within a single or even fixed discipline. Estévez Grossi (2018: 63 ff.) refers to different disciplines in which studies on community interpreting can be carried out and quotes Wadensjö's term *dialogic discourse-based interaction*. Wadensjö (1998) explores the role of language mediators by drawing on approaches from sociology and applied linguistics (e.g. discourse analysis) (Estévez Grossi 2018: 64 f.). In his article "The Interdisciplinary Approach in Community Interpreting Research", Vargas-Urpi (2011: 47) also lists five disciplines whose instruments and concepts can be applied to research on community interpreting: anthropology, sociology, applied linguistics, communication sciences and psychology.

Based on the AMS brochure "Job opportunities – Studies – Languages" (www.ams.at/biz), the Austrian professional association for interpreters and translators defines the job description of the community interpreter as follows:

> Community interpreters enable access to public facilities for people whose mother tongue is not that of the host country […]. They translate and interpret in the service of the community for individuals or small groups (families), mostly immigrants or refugees, in conversations with authorities and at social welfare offices, also at schools or in the health sector. Particularly, interpreters with rare language combinations are in

> demand. (Brochure of the Austrian Public Employment Service 2015: 62; English translation of the German original)

Pöchhacker takes a closer look at the community interpreter's field of activity and expands it as follows:

> Community interpreting refers […] to mediated communication in every kind of 'institution' – in the broadest sense: not only to offices and authorities, courts and hospitals, but also to counselling centres of 'private' associations, medical practices and law firms, even to commercial establishments. In principle, it is about interpreting in municipal institutions, in all situations of daily life in the community (municipality). (Pöchhacker 1997: 52; English translation of the German original)

Gentile et al. (1996: 117) had already emphasised that the term was too general, regarding all these fields of activity that it encompassed. We also see evidence of this assumption in the numerous terms used in English-speaking countries (*public service interpreting, community interpreting, dialogue interpreting*, etc., see above) whereby the common feature of the terms is that they describe an interpreting activity that is not performed at a conference (see Roberts 1997: 8).

Another important distinguishing feature of the community interpreter, especially with regard to the intercultural requirements, is the considerable importance of the cultural factor, which Andres presents as:

> Recognising the particular relevance of culture in mediation distinguishes community interpreting from court interpreting, where the emphasis is still on the transmission of words, but communicating cultural differences is only one and often an even controversial factor among others. (Andres 2008: 404 f.)

Other authors also see mediation between the cultures as a special task of community interpreters, especially when compared to conference interpreters (Gentile 1996: 111). This particular task of cultural mediation in community

interpreting is reinforced by the fact that the communication is usually more personal than in conference or court interpreting (Roberts 1997: 11), since community interpreting deals with a *face-to-face situation* and allows cultural differences to emerge more clearly. The Transkom study summarises this aspect once again and points to another important factor – the existence of different positions of power between the parties:

> The language and culture mediators are the link or bridge between the two parties. Their task is to balance the asymmetrical power gap between the parties and to contribute to the reduction of linguistic and cultural barriers. (Transkom study 2007: 58)

In addition, there is often an unequal language level and an unequal level of knowledge, education and experience that can lead to communication problems and misunderstandings.

Community interpreting is therefore a special kind of interpretation. In the interpreting situation, two sides meet, who in contrast to other types of interpreting, have a unique relationship. Normally, cultural aspects, expectations and attitudes are not entirely consistent. Bahadir addresses this specific circumstance:

> Any interpreter, whether medical interpreter, conference interpreter, delegation interpreter or court interpreter is imbedded in contexts. He/she is an enculturated and socialised person, has a certain perspective on his/her environment and represents a position as a person. Perspectives and positioning are dependent on situational factors. The interpreter and the interpreting process being imbedded in contexts causes irratation […] as this positioning means being dependant on hierarchies, power relations and social, political and cultural influences. (Bahadir 2020: 189; English translation of the German original)

The following table, which summarises and compares the features of conference interpreting and community interpreting, clearly illustrates the most important differences:

Conference Interpreter	Community Interpreter
professionalisation of the profession	often without proof of qualification
respected activity	less prestigious
equal communication partners	different positions of power
professional body	without lobby (yet)
languages: English, French, Spanish	minority languages, exotic languages
high level of education	refugee and migration field
well-paid	low-paid
monological interpreting into mother tongue	interpreting in both languages
team work	working alone
large audience	usually for two people
most common technique: simultaneous interpreting	conversation interpreting (consecutive), occasionally whispered interpreting
note-taking	note-taking as a reminder, but not constantly
topics are known, preparation is possible	unpredictable contents, hardly any preparation possible: flexibility
face-to-face less significant	face-to-face very important

In the following section, interpreting for public services and authorities will be discussed as the form of interpreting that neither takes place in court nor in a conference and which focuses on interpersonal and intercultural communication.

3 Roles of the Community Interpreter in Interactions

Community interpreters can take on several different roles in the course of their work – even within the same conversation – that go beyond mere language mediation. In contrast to conference interpreters who normally have no direct contact with their communication partners in the soundproof booth,

community interpreters have a conscious or unconscious influence on the conversation due to their presence and visibility: for example, they explain certain terms where necessary and thus already have their own interpretation as a basis and often take over the moderation of discussions. This emphasises the interpreter's active role which usually cannot be limited to passive, neutral language mediation. This active role takes on different forms depending on the situation, but not all converge with the professional ethics of interpreting (see below). Following Abril (2006: 96 ff.), we can identify the following roles:

- *Conduit:* Interpreter as a "mouthpiece". The focus here is on verbatim reproduction and consequently, on the role of the neutral language mediator. This is the role of the interpreter *per se*, the most common and also the most fundamental.
- *Clarifier:* If the role of *conduit* is not sufficient, the interpreter has to transition into this role in order to guarantee communication. It consists of explaining certain concepts that are not understood, for example if they do not exist in the target language (well-known examples in the German language: legal decisions, the youth welfare office, Certificate of No Impediment (Ehefähigkeitszeugnis), or concepts which the client does not understand). The interpreter intervenes and can independently request additional explanations, that are then conveyed.
- *Cultural broker*: The interpreter takes on this role if a cultural framework needs to be created in which a specific message is to be understood. This role is only used if the cultural differences complicate communication. The interpreter explains what may be hidden behind single words, differences in body language, etc.
- *Advocate:* This is the most active role for interpreters (i.e. working for the client's interests or taking sides) which aims at guaranteeing the quality of the interpreting job and is rather on the fringe of the job. In principle, it can only be assumed if a systematic barrier is found that is an obstacle to the fulfilment of the client's concern. It is usually concentrated on providing missing information that is important for the party, so that the situation can be solved to satisfaction.

The transitions between these roles can be fluid in practice and are therefore not clearly defined:

> The role of the community interpreter today is ill-defined or, more commonly, too vast. He is often expected to be not only a mediator between two languages, but also a help-mate and guide, cultural broker and even advocate or conciliator. In other words, he wears many hats. (Roberts 1997: 12)

Language mediators often have to intuitively decide which role(s) they will take on in the situation (Abril 2006: 96 ff.). The interpreter's roles, as they actually occur in practice, are shown in the following diagram based on Leanza (2005: 186 f.):

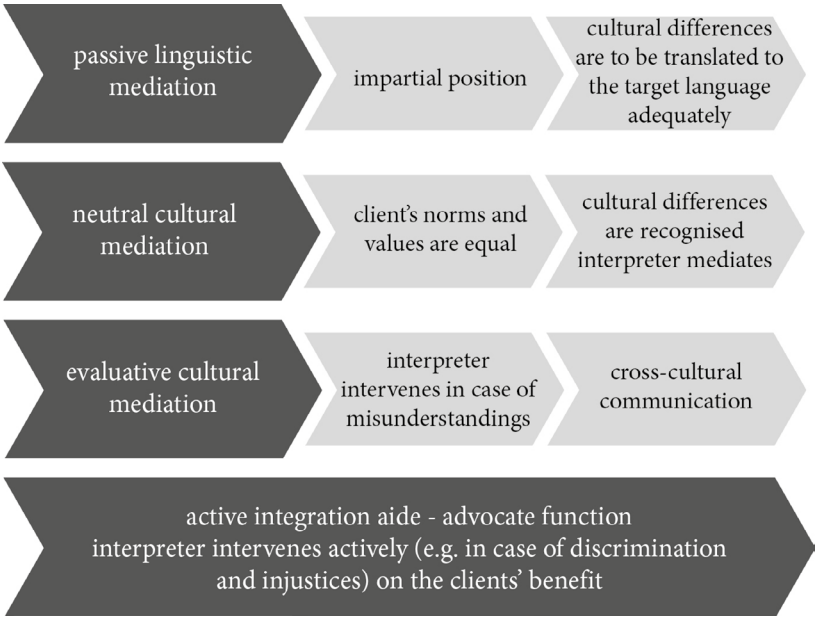

Figure 1: Interpreter's roles according to Leanza (2005)

It should be emphasised once again that the evaluative forms of interaction with regard to professional ethical guidelines are problematic (see below).

If we were to depict this model as a pyramid, the role of *conduit* would be on the bottom and that of *advocate* at the top. The further we move up the pyramid, the more active intervention of the interpreter is required. The interpreters' protagonist role becomes increasingly prominent and therefore receives further attention placing the interpreters in the centre of attention and even allowing them to independently speak FOR the clients. The community interpreter is therefore always *conduit* and often only a *conduit* if s/he also takes on the other roles mentioned, for example, to create the cultural framework for the communication partners as a *cultural broker* or to intervene as an *advocate* for the parties. This model is based on Roat et al. (1999: 15–23), who developed a manual for interpreters in the medical field. The manual was adopted as a standard by the California Healthcare Interpreter Association (CHIA) and can also be applied to other areas of community interpreting (see CHIA 2002).

4 Settings for Community Interpreters

In connection with interpreting for public services and authorities, the settings refer to the different environments in which community interpreters carry out their work. Taking into account the big differences between the term's breadth within the terminology of the subject, and also taking into account the practice that differs between the different countries, we concentrate on Germany, specifically on the field of authority communication in the public services and administration sector: For instance, at the local registration office (Einwohnermeldeamt), at the Immigration Office, at the registry office, but also at migration services or at the employment agency.

The "public services and administration sector" refers to those state institutions or offices that are responsible in the widest sense for the fulfilment of legally prescribed tasks. Since these institutions fulfil public tasks and laws or legal provisions, their actions are bound to precise rules, which initially affect the different discourse types of interpreting and last but not least also the respective written and oral mediation of information, which exhibits certain

specific characteristics. It must also be pointed out that the boundaries between "authorities" and other institutions (service providers, companies) are becoming increasingly fluid and the features mentioned below can therefore also be applied to other areas.

In the field of authorities and public offices, the community interpreter is confronted with a particular use of language that differs considerably from everyday language. Interpreters face challenges both in written texts such as applications, forms, legislation, etc., and in spoken communication. Knowledge of and familiarity with the peculiarities and characteristics of the common types of discourse in administration are therefore a precondition for being able to adequately master interpreting assignments. Since this area is naturally characterised by a large amount of written communication, just think of the numerous forms and leaflets the community interpreter cannot avoid acquiring knowledge of these types of written texts (for the characteristics of legal texts see Baumann's article in this volume). This applies to both a general familiarity with the field and its types of text, as well as to concrete preparation for the individual interpreting assignments. In this case, interpreters can conduct research before an assignment, for example, on expected legal terminology or the text types "form texts, legal decisions". If the place of deployment is a local registration office (Einwohnermeldeamt), terms such as *mandatory field, right of objection, registration form* may be used. Such terms often require knowledge of the German administrative machinery (e.g. mother's legal status, German Data and Transmission Act). Some single texts occur particularly frequently in this context. For example, every tenant must present the "confirmation of tenancy" from the landlord on an official form when registering. Such texts can be further examined as part of training courses with the participants and ways of dealing with them can be developed. The legal consequences for the undersigned should be explicitly discussed as well as the characteristics of the administrative language (clear mediation of information, accuracy, compressed, abstract and impersonal style). This way, the training participants are given a perspective on other, similar texts that they will encounter in the course of their work.

The interpreters can often view and prepare the necessary documents in advance. This also applies, for example, in the case of an assignment at the

registry office and relates here, among other things, to the form "power of attorney to give notice of impending marriage", which is a distinctive example of legal-administrative communication, and also when a "request for an exemption of provision of a certificate of no impediment" or an "application for recognition of foreign judgments in matrimonial matters" must be made. For forms, the correctness and completeness of the data must usually be confirmed by signature; an infringement regularly constitutes an infraction. Here, interpreters are in demand as mediators who provide information about the requested act and its possible consequences.

One of the initial points of contact for foreign citizens is the Migration Advisory Centre of different agencies (e.g. Caritas), as well as the Immigration Office. The new immigrants receive support during the integration process in Germany, as well as the necessary information regarding their language, professional and social integration. This also includes arranging integration courses that are often offered individually by the advisory services. Since many foreign citizens, especially in the beginning of their time in Germany, do not speak German, they are often accompanied by interpreters.

In connection with the application for an integration course, interpreters can prepare for possible questions from their clients using the website of the Federal Office for Migration and Refugees. The website features, for example, frequently asked questions about the integration courses and required forms can also be downloaded.

Experience has shown that applications for certain benefits such as unemployment, sickness or child benefits are often an important part of interpreting consultancy work, both in the Migration Advisory Centres with social workers who provide advice to foreign clients or in Jobcenters in Germany. The form for applying for unemployment benefit is a text that has to be dealt with again and again, so community interpreters should acquire knowledge in order to be able to adequately fulfil their assignment. The interpreters must provide additional explanations where needed and use further interpreting methods (see below for interpretation techniques).

5 Professionalising Community Interpreters

Some municipalities in Germany have recognised the social relevance of the topic discussed here and the need for action. Therefore, they have designed training measures that are based on the specific needs and the urgency of the current situation. For example, in Braunschweig and Wolfsburg, training courses for language mediation in the public services and administration sector are held at regular intervals (see the websites of the city of Braunschweig and Wolfsburg). In these cases, the teaching content and aims of these training measures are developed from special situations that are most comparable to part-time training measures or further education outside of universities. Bilingual people, who do not have translator or interpreter training, can benefit from such qualifications as they probably have completed training and education in a different area and may already be working as language mediators. After having successfully participated in these professionalisation measures, the data of the participants with their language combination and further information (gender, age, professional qualification, etc.) are entered into an interpreter database. Employees of various municipal institutions have access via the Office for Migration Issues in Braunschweig and the City of Wolfsburg's Department of Integration (see also intercultural city administration in Wolfsburg).

6 Contents of Professionalisation Training Courses

Since this target group lacks a variety of required competences and skills before the training course, the content of the course must be determined and will introduce the participants to this field and help them to acquire the required competences and skills. These are in particular:

- interpreting competence
- language competence and cultural competence in their mother tongue and in German
- specialised knowledge and professional ethical principles

Also important, however, are:

- institutional background knowledge in the fields of social affairs, education and health
- knowledge of principles and aims of institutions in the host state
- knowledge and principles of the laws of the country
- knowledge of the role and requirements for community interpreters
- theoretical basic knowledge in the fields of translation theory, linguistics, sociolinguistics, pragmatics and discourse analysis
- broad general knowledge

Due to budgetary and time constraints language teaching is not offered in this type of training. Therefore, the participants are required to have sufficient language skills, which are tested in the selection process for the courses.

Another difficulty is certainly also the differing degrees of prior knowledge of the participants, which would be too cumbersome to evaluate before the training course. Therefore, it is not easy to choose topics and to decide how intensively they must be taught to ensure that the course is neither too easy nor too difficult (Hale 2005: 175 f.).

In the following, some common content that are part of such professionalisation training is presented. In addition to a short overview of communication strategies, interpreting techniques and the professional ethical foundations are explained.

6.1 Communication Strategies

Overall, interpreters must be able to apply communication strategies in order to enable communication. The following concepts are of particular importance:

- Client-oriented linguistic action
- Scenic explanations (pre-formulating of linguistic actions and atomisation of steps)
- Paraphrases, repetitions
- Adoption of perspectives without interpreters making autonomous decisions

- The client must not be reduced to a passive or dependent role. Accordingly, any kind of paternalism must be avoided. The interpreter cannot make decisions, the client or the administrative employee must decide. The interpreters establish communication and are only responsible for this task.

Especially the last issue is often not intuitively comprehensible for interpreters who are part of the community for which they are performing the interpreting tasks, which is why it must be part of their professionalisation training. Furthermore, interpreting techniques that aim at overcoming linguistic, expert and expert language barriers must be learnt (see Rink's article in this volume).

6.2 Interpreting Techniques

Interpreting techniques play an important role in professionalisation training for community interpreters. These can be distinguished at the macro level, meso level or micro level.

Macro level

Interpreters must learn to:

- … understand the coherence of the situation. This is an important requirement in order to achieve coherence in the target text in accordance with the source text and in consideration of the reception situation. Interpreting form texts is particularly challenging as they have a distinctly pronounced target text embedding due to the joint process of completing the form (Rink 2020 and the article by Maaß in this volume).
- … steer and interact with the dialogue partners in an explanatory manner. Most of the time, occasional queries will be necessary from both sides.
- … successively adjust the linguistic realisation to the dialogue partners: the specialised German "language of bureaucracy" must be translated into a very concrete, simple style in the target language and, when working in the opposite direction, must be adjusted to the respective linguistic form of (German) forms (see micro technique).

Meso level

One of the characteristics of communication with authorities is that their representatives are committed to their functional roles and need to act according to these roles. Here, communication is often based on different components. As an example, filling in a form together includes the following steps:

Dialogue + form + information sheet

One expert language feature of the German language of bureaucracy is that it is mostly characterised by addressing the reader in a very distant and impersonal manner which must be offset by the interpreter in the communication situation. Another challenge for interpreters is the terminologisation of everyday language (Rink 2020). In these contexts, everyday language is assigned a specialised meaning (vocabulary shaped by expert terminology) while terms of everyday language use are occupied with specialised terminology:

Terminologisation of everyday language in German:
Unterbringung: which in everyday language refers to "accommodation" but in certain context can also be used to mean "commitment" in the sense of → compulsory institutionalisation in the secure unit of a psychiatric clinic
Betreuung: which in everyday language can refer to "care" or "support" but in legal contexts can also mean "legal guardianship", as in → legal representation of an adult in need of aid under consideration of his or her own will

Specialised terminology for terms of everyday language use:
parents → legal guardians
children and adolescents → minors
older people → seniors/elderly dependents

Micro level

Potential challenges can arise at all linguistic levels here.

At the level of **phonetics** or pronunciation, the correct understanding and reproduction of names and specialised terms is important. In this case, interpreters must learn note-taking techniques as well as transliterations that are common for their working language, but also techniques for coping with such problems (e.g. asking for the spelling or writing down entire words).

At the level of **lexis/word choice**, dealing with specialised terminology is important. It has already been mentioned that examining the specialised terminology that is relevant for the interpreting job, as well as preparing for the individual fields and subjects is part of the professional standards. Especially for community interpreters working outside their subject area, dealing with specialised terminology is a special challenge that must be focused on in training courses in order to learn the respective techniques and strategies (e.g. explanation, paraphrase, generalisation) as well as techniques to correct a possible loss of information later in the course of the interpreting job.

At the level of **syntax**, techniques for forming understandable sentences (avoiding complex sub-clauses) as well as for developing an information structure are part of the training.

At the level of **pragmatics**, style and perspective must be considered: address, dealing with questions and queries, use of impersonal expressions, labelling of own questions.

At the **text level**, the development of the entire conversation, avoiding sub-themes and side issues, integrating summaries and the development of a conversation that is understandable and successful for both parties is important.

It stands to reason that dealing with common documents (see above) should be taught in training courses. Through role playing, it is possible to practice and work on essential aspects of a successful conversation with interpreters. First, the group can observe the conversation with an emphasis on the behaviour of the participating persons and can answer the following central questions at the same time:

1. The behaviour of administrative employees or specialists: Which behaviour has a positive influence on the collaboration with the interpreter? Which behaviour is a disturbing factor for the conversation?
2. Similar to the specialist, the interpreter's behaviour is also observed: Which behaviour has a positive influence on the collaboration between the dialogue partners and interpreters? Which behaviour interrupts the communication process?
3. The client's behaviour: Which impact does the behaviour of the administrative employee and of the interpreter have on the user or the client?
4. Roles of the dialogue partners: Are the respective roles of the dialogue partners clear (clients and/or – if available – carer, interpreter, administrative employee)? Are those roles clarified beforehand? If yes, how?
5. Possible change of roles: Is there a change of roles during the conversation? Do the persons really change their roles during the conversation? What is the reason for it? Is it beneficial for the conversation or does it hamper the conversation?
6. If it comes to a change of roles: Are the dialogue partners informed about the change of roles and is all information given to all participants?

To analyse the actual conversation in the interpreting constellation, the following aspects must be considered:

- Course of conversation as a whole: single stages, flow of conversation, taking control in the conversation (who manages the conversation?), turn-taking (how is the change of each contribution communicated?), balance of the contributions (is there a dominance between the dialogue partners? How is this dominance shown and articulated linguistically?); involvement of the participants (do participants feel out of place? How is it shown?); protagonism of the participants.

- realisation of verbal communication: choice of words, specialised vocabulary, flow of speech, single sequences, breaks, silences, prosody.
- nonverbal communication: What is striking? What are the postures, facial expressions and gestures? Which conclusions can be drawn from posture?

6.3 Professional ethical foundations

In addition to the communication strategies and the actual interpreting techniques, the professional ethical foundations are a particularly important component of professionalisation training. Especially interpreters who belong to the same group as the client often intuitively consider themselves as an advocate or are treated as such. It is very important for professional interpreting that the future experts understand that they can indeed assume the function of cultural mediator, but are however, not advocates for the clients. Therefore, teaching professional ethical foundations is an essential requirement for professional interpreting.

Community interpreters cannot refer to a code of ethics yet even if different professional organisations have developed their own directives. The interpreter's behaviour must therefore be guided by the acknowledged and established professional ethical principles e.g. as they have been required for conference interpreters by the International Association of Conference Interpreters (AIIC) since 2018. Their code of professional ethics determines standards for professionalism, confidentiality and integrity. In Germany, the Federal Association of Interpreters and Translators (Bundesverband der Dolmetscher und Übersetzer) represents the affiliated associations. The aim of its guidelines is, among other things, to nurture trust between the parties and to ensure quality, the reputation of the profession and proper ethical behaviour. ADÜ Nord (associated translators and interpreters in northern Germany), whose members are from Hamburg, Schleswig-Holstein and Lower Saxony, created a code of professional ethics with the purpose of maintaining the reputation of the association and the interpreters and translators associated with it in light of the unprotected occupational profile. The following categories are central for professional interpreting according to these regulations:

- **Confidentiality:** Interpreters are bound by professional secrecy and must follow the obligation of confidentiality. They may not use the acquired information for their own purposes.
- **Loyalty of profession:** The interpreter must only accept assignments that he or she is able to handle. To ensure high-quality work, the interpreter needs the respective information material from the client.
- **Neutrality:** The interpreter must not express his or her opinion; whether if it is about their own work or about the dialogue partners.
- **Respectful interaction with the dialogue partners:** Every dialogue partner is treated equally, with respect and dignity regardless of nationality, age, skin colour, social status, religion and political or ideological mindset.
- **Commitment to worthy working conditions:** Respectful behaviour towards the profession (for oneself and colleagues) and prevention of disloyal competitive conduct.

Moreover, interpreters must consider the following aspects of the working situation:

- **The work environment:** They must ensure punctuality and appropriate clothing; possible mishaps are taken into account.
- **Dealing with the dialogue partners:** Interpreters react according to their role, present possible problems and act with foresight; they are actively involved in the management of turns and the dialogue (different scenarios are always considered).

The interpreter's tasks derive from the mentioned professional ethical directives. In concrete terms, he or she must abide by the following rules:

The interpreter

1. … transmits everything that is expressed during the conversation without adding, changing or leaving out information.

2. … is neutral during the interpreting job. His or her personal mindset must not influence the interpreting process.
3. … only focuses on the interpretation and does not make own decisions in the situation.
4. … maintains confidentiality.
5. … is not responsible for the truthfulness of information that is exchanged between both dialogue partners.
6. … represents neither of the involved parties.
7. … is required to state:
   - whether he/she is related to or married to one of the parties
   - whether he/she is involved in the present case
   - whether he/she has previously acted on behalf of one party
8. … is obligated to inform if he/she cannot complete the task to a satisfactory level.

Professional secrecy implies:

1. All information that the interpreter has access to through his/her work is confidential.
2. Professional secrecy involves everyone: employers, colleagues and family members.

Even after completion of the interpreting job, professional secrecy is maintained (see ADÜ Nord 2009).

As already mentioned, due to lacking binding instructions for interpreters in the public services and administration sector, the preceding codes of ethics of the listed organisations represent orientation guidelines that are mainly intended to help the interpreter make individual decisions based on the respective context and the according and always unique situation. To that end, Hale (2005) states:

> Interpreters will always need to use their discretion and better judgement to make the appropriate decisions for each situation, led by the general guidelines of the code of ethics.

Nevertheless, despite the recommended directives of correct behaviour, inner conflicts and border cases can occur in the daily work that cannot be determined by the rules of professional conduct or guidelines, and for example in the case of neutrality conflicts, may require a specific ethical analysis. Interpreters, who work in e.g. administration, take responsibility for their own actions and mostly act according to the specific situation. This makes it difficult to identify individual cases and to refer to the rules of professional conduct because supervisor authorities beyond the professional associations are normally missing. Some experts disagree with the feasibility of adhering to complete neutrality in practice and are of the opinion that an interpreter cannot completely stand back and become invisible (Bahadir 2001), because his or her mere physical presence would cause a "nonpossibility for interpreters to be nonpersons" (Bahadir 2001: 4). In the end, they are caught in the conflict between neutral positions and the shared knowledge of an insider. However, others see the neutrality of the interpreter endangered by clients who employ the same interpreter's services, developing a relationship of trust between the client and the interpreter over time which could challenge impartiality (Stanek 2011: 150).

Regarding the interpreting situations that are portrayed here, it shows that the interpreter cannot only be non-invisible, but is an important active part of the dialogue because s/he is mostly responsible for managing the conversation, and in addition, explaining ambiguous concepts and removing cultural comprehension problems. In doing so, adopting a moderate attitude is necessary as well as minimal independent interventions in the communicative situation. However, even if interpreters follow the professional ethical directives mentioned above, it is mostly up to the interpreter's personal judgement to make independent decisions in order to master the various communication situations, which is also due to the impossibility of anticipating all possibilities of the interpreting job.

7 Conclusion

This article attempted to define the field of community interpreting and to delimit it from other types of interpreting. Furthermore, some concrete examples of strategic proceedings in the public services and administration sector were presented and training contents for possible professionalisation measures for community interpreters were outlined as they are already practiced by some municipal administrations in Lower Saxony. In public institutions in an immigration society that focuses on the integration and participation of its citizens, the promotion of projects of this kind, which serve to improve communication between the new immigrants and the native citizens and to promote the immigration procedure, is gaining more and more importance. For this reason, our society carries a great deal of responsibility with regard to the realisation and establishment of such positive and necessary offers, of which it can only be hoped that they are not merely of a selective nature, but that they will be institutionalised by the responsible political persons in the near future.

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Media areas and text types

Alexander Kurch

Production processes in subtitling for the deaf and hard-of-hearing and audio description: Potentials of partly automated process acceleration with the help of (language) technology

1 Introduction

In the last few years, German public broadcasters have implemented a considerable range of additional accessible content in their television programming and made it available in their media libraries (e.g. see the Rhineland-Palatinate state parliament 2017 and Heerdegen-Wessel in this volume). However, the process of designing audiovisual media that would be accessible for people with sensory impairments in public institutions and private companies is still in its early stages with public awareness for the necessity of these services also still lacking. This applies to content with audio descriptions, subtitles, sign language interpreting and translations in (German) Easy Language.

Particularly in the age of digitisation, the variety of medial offerings is steadily increasing, mainly through various providers in the private sector. Nevertheless, these providers face financial and personnel challenges with regard to how an additional offer of accessible content could be produced and implemented across the nation.

In the future, this will require faster production processes at lower costs in order to meet the need for accessibility in all areas. The intensified research into and development of technological aids and an increasing use of machine learning techniques open up new opportunities in this context that will be of particular help in the areas of subtitles for the deaf and hard-of-hearing and audio descriptions.

The aim of this article is to provide an overview of the current production processes in the German-speaking countries. Furthermore, this article exam-

ines possible and partially already existing semi-automatic processes (Ger. Teilautomatisierungsprozesse, TAP) in terms of how far the potentials of different technologies in combination with machine learning techniques can be exploited in the area of accessible translation of audiovisual media.

2 Subtitling for the deaf and hard-of-hearing (SDH) and audio description (AD)

By transcribing and broadcasting auditory content in the form of subtitles, subtitling for the deaf and hard-of-hearing (SDH) provides people with access to information that they cannot normally receive, or only inadequately, due to a hearing impairment (Hezel 2009 and Mälzer/Wünsche in this volume). Audio description involves transferring visual information to spoken language for blind and visually impaired people (cf. Jekat 2016: 70 and Benecke in this volume). These forms of audiovisual and intralingual transfer can be applied beyond film and television in a wide variety of areas where accessible content needs to be created.

The production processes for creating these two accessible options require a large number of steps, some of which are extremely time-consuming and expensive. This therefore raises the question of how (speech) technology can be used to accelerate these processes so that more content with SDH and AD can be implemented in a shorter time. In this context, there are already technologies namely speech recognition and speech synthesis that allow for automated conversion of speech into text or text into speech and offer more cost-efficient production alternatives, nowadays as commercially affordable software-as-a-service (SaaS). First, however, let us closely examine the production processes currently used in Germany for the creation of SDH and AD in order to provide an understanding of the qualitative demands of current SDH and AD practice and to gain an overview of the applicability of speech recognition and speech synthesis in this context. Then, approaches to technology-enhanced production of SDH and AD will be presented.

2.1 Current production processes for subtitling for the deaf and hard-of-hearing in Germany

2.1.1 Post-production of SDH

There are already a range of different computer-assisted subtitling programs for the post-production of subtitles that enable a rapid creation of SDH. These programs offer their users numerous functions that make it possible to produce intralingual subtitles relatively quickly. As per the standards and style guides of the client, the necessary technical specifications can also be taken into account.

The technical components of a subtitling software allow the entry of basic values for the display time of subtitles, which facilitate optimal reading speed for the recipient (usually measured in characters per second). This software can automatically calculate the display time of subtitles on the basis of characters and number of lines and generate the minimum time interval between the individual subtitles. In addition, the program automatically distributes the text of the subtitle to two lines, so-called segmentation, which is performed exclusively according to the number of characters per line and is not based on syntactic and semantic aspects. The next step comprises the linguistic editing of the text by an editor in order to produce high-quality subtitles that can be perceived with as little effort as possible, a task that cannot be performed automatically by the software.

The linguistic editing of subtitles includes a wide variety of tasks: unless the subtitle editor has a dialogue book, all spoken and other audible parts of the broadcast material must be transcribed at the beginning, i.e. all spoken utterances and noises. When the original sound is transferred into subtitles, a transmission from oral to written language takes place. Therefore, the subtitled text does not necessarily correspond to the text in the original audio. The subtitle editor makes corresponding changes in such a way that there is as little loss of information as possible.

This may entail the elimination of spontaneous language features, such as filler words, empty phrases, hesitations as well as repairs of sentence breaks, unfavourable, difficult-to-understand syntax and other linguistic revisions, to name just a few examples. The word-for-word transmission of the original

sound into subtitles is not possible due to time and space restrictions. The reason for this is that the production of subtitles requires compliance with client-specific requirements regarding display time and number of subtitle characters. It is therefore necessary to select the auditory input according to primarily content-bearing components and often to restructure the text in order to ensure optimal readability of the subtitles.

Emotions, subtext, connotations to what has been said (e.g. (angry), (ironic), (loudly)), as well as sounds and music should also be subtitled in brackets as non-verbal, para- and extralinguistic elements. Furthermore, a switch in speaker must also be indicated in brackets and partly marked in a different colour by the subtitle editors, enabling recipients to assign the individual subtitles to the respective speaking actors in the frame as quickly as possible.

In addition, the textual content of the subtitles must be distributed across the two lines of a subtitle (segmentation). In this respect, recommendations of "good subtitling practice" (Ivarsson/Carroll 1998, Díaz-Cintas/Remael 2007) provide a great deal of assistance with regard to linguistic processing in terms of optimal segmentation making the subtitles easier to read for recipients.

Above all, technical processing of subtitles by editors focuses on time coding. To achieve precise fading in/out times, a time stamp is required for the start and end of the subtitles that is based on the client's respective specifications for display time of a subtitle. As a rule, subtitles should appear as synchronously as possible with the image and sound of the source material or lip-synchronously with the spoken original sound.

It becomes clear that post-production of subtitles for the deaf and hard-of-hearing is very complex for the responsible editors, even if a subtitle software specifically designed for this purpose is used. The manual work takes a lot of time owing to the written implementation of all spoken and other auditory content in the form of subtitles, time coding, colour assignment for speaker change, as well as segmentation of each individual subtitle. Help is available in the form of automatic speech recognition (ASR), which has already become established in the field of live subtitling, but has so far only been used sporadically in post-production.

2.1.2 Production of SDH and speech recognition

Speech recognition (ASR) is currently used primarily in live subtitling for broadcasts or events for which no content can be prepared in the form of pre-produced subtitles due to the demand for real-time information ("Aktualitätsdruck", Lindner 2016: 313), as is the case in post-production of subtitles. Here, subtitle editors must "create the content by means of speech recognition at the exact moment when it […] takes place" (ibid. 312; English translation of the German original). For this reason, ASR software has become a significant tool in public broadcasting in recent years, where it is used for the production of live subtitles on television (Käber 2016); and beyond broadcasting in the areas of written interpreting (see VerbaVoice GmbH, Witzel in this volume). The task of ASR in this context is to convert "a speech signal into a textual form" (Pfister/Kaufmann 2017: 28; English translation of the German original), i.e. "a spoken text should be recognized by the system and, for example, be put out in the form of a written text" (Fellbaum 2012: 306; English translation of the German original). However, the question arises to what extent speech recognition can be integrated as a computer-aided tool for increasing productivity in the post-production of SDH.

First, a distinction needs to be drawn between speaker-independent, speaker-adaptive and speaker-dependent ASR. ASR software achieves best results when a personal user profile is created for the respective user and set up for specific subject and expert areas (domains) (cf. Pfister/Kaufmann 2017: 334, Fellbaum 2012: 307).

Speaker-dependent and speaker-adaptive ASR systems differ from speaker-independent systems in their multitude of functions, which allow the extension and maintenance of user-specific language profiles in just a few steps. This increases the recognition accuracy and/or reduces the recognition error rate, especially for words and terms that are unknown to the created voice profile and thus to the system. Due to the speaker-adaptive component of the ASR, the systems become increasingly better adapted to the respective user (Fellbaum 2012: 309).

In the case of live subtitling, the applied ASR is a hybrid form of speaker-dependent and speaker-adaptive speech recognition system. The transmission of auditory content can be achieved through the simultaneous use of a subti-

tling software and a speaker-dependent and speaker-adaptive ASR software. Thus, by means of so-called "respeakings", the reproduction of auditory content through the spoken word of a subtitle editor can be converted into subtitles with the aid of a microphone and the above-mentioned computer applications. According to an ASR provider, time savings of up to 66% can be achieved by dictating instead of typing transcriptions (Nuance 2015).

As an alternative to speaker-adaptive ASR, there are now some providers of speaker-independent, automatic transcription systems and editors that add time stamps to the spoken word and achieve a recognition accuracy of 80% to 90% with accordingly good audio quality. With an integrated editor and other functions, as well as automatic subtitle generation, these solutions promise a significant increase in productivity (i.a. Nuance, TRINT 2016, Myers 2018, 3Play Media 2018).

However, as stated above, beyond the pure reproduction of the spoken content and additional information, further human-machine interactions are required for the next steps. These include:

- textual editing and restructuring of the original sound in terms of mode-switching from oral to written language
- transmission of non-verbal, para- and extralinguistic information
- (re)structuring and clarification of overlapping parts of the conversation
- filtering out interfering and background noise
- insertion or correction of punctuation marks
- colour coding of speaker changes
- segmentation optimisations of the subtitles for optimal reception where required
- corrections of the speech recognition output in case of faulty recognitions

Fully automatic speech recognition would therefore reach its limits in many respects with regard to SDH, which in turn makes the human component indispensable.

2.2 Current production processes of AD in Germany

2.2.1 Post-production of audio description

Production of an audio description begins with a review of the film material and the time periods during which there are silent pauses for the audio description or there are noises, music etc. that require image descriptions (Jekat 2016: 82). Ideally, this is done in a team of one or two sighted authors and a non-sighted team member, whereby the composition and number of team members varies from one AD service provider to another. If only one author creates the AD text, at least one blind or visually impaired AD editor must check and approve it for flawless functionality. After adapting the AD script, the individual AD passages are recorded by a professional speaker in a recording studio. In the recording studio, a sound engineer, sound designer and sound director are usually involved in the process. Finally, the original film sound is balanced and mixed with the AD for the final audio described version of the audiovisual source material (cf. Benecke 2014: 14 ff.).

There are also a few software systems that can aid in this form of accessible post-production (Jekat 2016: 82). As with the subtitling software, these systems allow for time coding. In this case, however, the focus lies on the time periods during which no spoken content is available or no film sound can be heard and which are therefore suitable for recording AD passages. Nicolai accurately describes this process as the "acoustic subtitling of visual media" (ibid.; English translation of the German original). The AD text can be entered in these time-coded periods and recorded with a microphone for testing purposes, namely to check whether the description fits into the specified time slot. In this way, adjustments can be made if necessary, i.e. the audio description will be shortened or revised. In some of these AD programs, the entire audio described version can be produced and exported as a broadcastable format (Jekat 2016: 83).

2.2.2 Post-production of AD and speech synthesis

As an alternative to "traditional" AD, software solutions have recently been developed that, in addition to the above-mentioned functions, reproduce the AD text with an artificial voice in different languages and by speakers of different sexes. This is possible, on the one hand, due to a locally installed software

for speech synthesis. On the other hand, there is the possibility of using text-to-speech synthesis (TTS), that is available via cloud-based Platform-as-a-Service applications (PaaS) (i.a. Video To Voice GmbH, Mieskes/Martínez Pérez 2011). In contrast to ASR, this TTS software converts orthographic text input into a spoken speech signal (Pfister/Kaufmann 2017: 27). This production process is known as TTS AD (Szarkowska 2011). In this paper, the abbreviation TTS AD is used for audio description with text-to-speech synthesis.

In addition to the "pure" AD text, further information can be added to optimise the prosodic expression of the speech signal, e.g. information on speed, pitch and intonation, emphasis for the prosody and intonation of individual letters, words and sentence segments. Thus, the embedding of TTS, as an alternative to recording the voice of another person, allows the reproduction of AD passages with an artificial voice. This language technology can also be used to test the optimal length of the AD text in the available time periods. This is done on the one hand by selectively listening to the respective AD text fragment with the help of an artificial voice, on the other hand by an automated calculation of the approximate time length of the AD segment based on characters used. In this way, the AD editor is informed whether the audio description that is to be reproduced via speech synthesis fits into the available time span for the respective AD passage.

In the case of financial restrictions, the AD segments reproduced by speech synthesis can be automatically merged with the original audiovisual material in the course of this production process. Some of these multifunctional applications can automatically balance original sound and TTS AD. However, this alternative still differs significantly in its quality from "traditional" AD. It is therefore crucial to determine which formats – or in this sense, which "AD text types" – can use this alternative production option, which also requires further research. Nevertheless, this technology can be used as a more cost-effective way of providing access to audiovisual media for people with visual impairments, who would otherwise not be able to access AD because of financial hurdles. In this context, Szarkowska also stresses (2011: 146):

> "TTS AD is by no means intended to replace the audio description practice currently in use. Rather, it aims to supplement it and to increase

> the number of audio described films and audiovisual programmes made available to people with visual impairments."

The acceptance of TTS AD as an alternative to AD has been confirmed in various studies (Matamala 2016: 279 ff.), including a study in German-speaking countries, which also showed that a human voice is generally preferred (Kurch 2016: 59 ff.).

However, the use of language technologies as a tool for intralingual translation shows that it is overall worth taking a closer look at recent technological innovations. In particular, the symbiosis of machine learning techniques and language technology for capturing, understanding and generating the natural language has increasingly found its way into research, industry and society in recent years (Härtel 2016: 68). The combination of these two areas and the intensive research showed remarkable results. The following chapter therefore deals with the question of the extent to which machine learning techniques (ML) in combination with language technologies can support intralingual translation.

3 Semi-automatic processes for the post-production of subtitling for the deaf and hard-of-hearing and audio description

In the course of various research projects in Spanish-speaking countries, experiments were carried out with extremely innovative approaches on the partial automation (Teilautomatisierung, TA) of various intralingual translation tasks for the production of accessible audiovisual media (Álvarez Muniain 2016: 205 ff., Matamala 2016). Over the past few years, ML has increasingly been tested for semi-automatic processes (TAP) of various workflows, especially in subtitling. Some commercial solutions have already been developed in this area that allow for semi-automatic generation of subtitles for audio and video files. These solutions include various technologies that automatically convert the spoken word into text and text into words, and record assignments to each written and spoken word using time information and adding time stamps.

Occasionally, the input and output times of the subtitles still require minor post-processing by the respective editors, including the human transfer services mentioned above. However, the following statements should be viewed as a theoretical outlook in terms of a best practice, in which the currently existing potential is highlighted.

The synergy of various language technologies and ML has achieved some very promising results. These allow for a time-efficient and thus more cost-efficient production of accessible media content in the field of SDH and AD (Álvarez Muniain 2016, Matamala 2016). The potentials of these technologies in terms of a best practice workflow will be outlined in the summary below. In the following overview, different tested semi-automatic processes will be applied, which are able to automatically fulfil the above-mentioned requirements to a certain extent through a combination of ML with various (language) technologies.

Technologies in audio and speech signal processing are already being successfully used today, e.g. when interacting with smartphones and navigation devices via voice input and output. Nowadays, audio content analyses enable the automatic extraction of semantic information from audiovisual content that includes analysis of speech, music and/or sound segments. And there are numerous related technologies. In the current application example of these technologies, comprehensive data records of existing, accessible audiovisual productions are required. In this case, these are data of existing SDH and AD. The data is fed into the respective system in order to learn from them (ML : SDH and AD data set). Using this information, the system can apply what has been learned to new audiovisual material (AV text : SDH± AD). This means that the spoken contents of subtitles and audio descriptions can be automatically transcribed and timed (with time codes) that were not used as learning material for the ML and are therefore unknown to the machine.

The usefulness of an AD transcript can be explained by the fact that it could be used in cases where an interlingual translation (TL) of the respective AV text is required. As a result, the AD would not have to be rewritten from scratch (Jankowska 2015) and could also be produced as TTS AD. This production method must, however, be checked to ensure that it is associated with the desired time and cost-saving advantages and meets the given quality requirements for the AD production.

Using the information-enriched material provided through the machine learning process, the transcription and time encoding can be generated automatically for an audio file, including metadata that contain information about punctuation, capitalisation, speaker separation and assignment of speaker IDs, sentence segments etc. (Álvarez Muniain 2016: 45). To do this, the processing of the new audiovisual materials undergoes several steps, which can relieve subtitlers or translators of audio descriptions of much of their work.

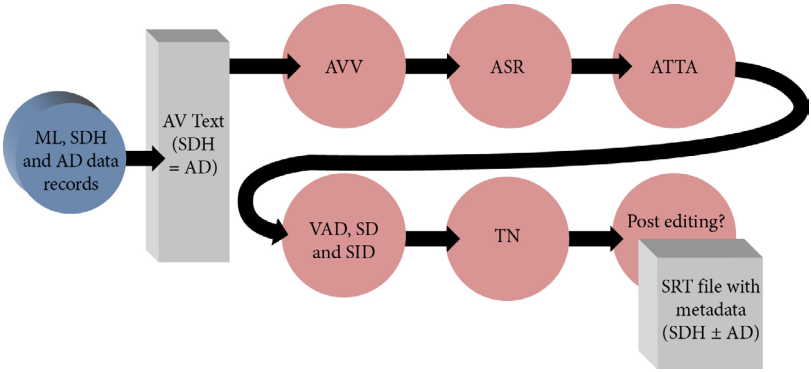

Figure 1: Pipeline for the pre-processing of the AV text using ML and (speech) technology

By means of audio pre-processing (Audiovorverarbeitung, AVV), the contents of the material are recognized as linguistic or non-linguistic components. The language parts are then transcribed via ASR. Subsequently, the transcribed speech components are assigned to the spoken signal of the audio track, whereby the acoustic and textual parts are linked word for word and time coded (so-called audio-to-text alignment, ATTA). Furthermore, acoustic, prosodic and linguistic information is extracted from the ASR output. This information may help to identify the different speakers within the AV material in order to identify them (voice activation detection, speaker diarisation and speaker identification, VAD, SD and SID, Matamala 2016: 273 f.).

In the next step, text normalization (TN) such as punctuation, capitalization and the conversion of numbers, dates and quantities (e.g. monetary units and percent) etc. is implemented. Since the system does not work flawlessly,

human control and revision in the form of post-editing are still required to ensure correct transcription, time encoding and speaker assignment for all content. This can then be saved for example in an SRT file format including metadata for further processing.

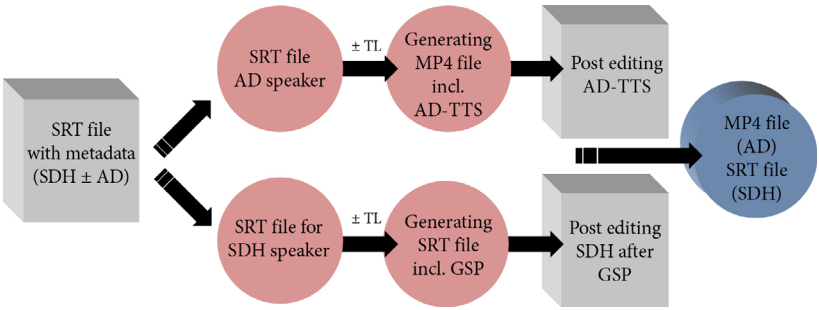

Figure 2: Processing of the SRT file including post-editing of AD and SDH files

The metadata from this SRT file can be used to extract the respective language units, which can be assigned to either SDH or AD. It may be necessary for an editor to select the speaker parts manually or to check the correct assignment of the language units to the respective speaker IDs (for example the AD speaker as speaker ID) (ibid. 274). Due to the "learned experience" via input SDH files, characteristics according to a "good subtitling practice" (abbr., GSP, cf. i.a. Ivarsson/Carroll 1998, Díaz-Cintas/Remael 2007) or the specifications of agreed standards for an intralingual SDH (cf. i.a. ARD, version 2015) can also be applied to the material to be processed. Thus, an automatic generation of SDH can be created including various aspects such as:

- synchronicity of the SDH with the image and sound, which remains as lip-synchronous as possible and close to the original text
- adequate display time calculation and time coding of individual SDH by characters and lines according to the required base values for adequate reading speed of SDH, e.g. readable characters per second
- segmentation requirements
- colour assignment of speakers and voices

- compliance with orthographic guidelines, standards, directives and style guides

Since the preliminary work of the system is by no means error-free here either, the SDH must be checked for errors and corrected within the scope of post-editing. Moreover, unrecorded additional linguistic information such as sounds, music, non- and para-verbal content should be added in brackets. In this way, a corresponding SRT file could be created in an accelerated procedure for the AV material to be processed.

In the case of the AD, the respective AD segments, which may be intralingual translations, must be generated as MP3 files for auditory output using TTS and checked in terms of whether the output meets the qualitative requirements. If this is not the case, the above-mentioned optimisation measures can also be carried out in a post-editing process (see 2.2.2). After a final review of the appropriate length of the AD components within the existing dialogue pauses, these parts can be automatically merged with the AV material and exported as an alternative TTS AD audio described version to the "traditional" AD as an MP4 file.

4 Conclusion and outlook

The previously mentioned alternative production methods highlight in what sense it is possible, by today's technological means, to produce cost-effective and time-effective SDH and AD for audiovisual material and which further approaches would be conceivable. Every finding, especially outside of the German-speaking countries, has to be tested and applied in terms of efficiency and production improvement concerning German SDH and AD productions, in order to scientifically fathom the actual cost and time savings. Only then can a valid statement about the possible acceleration and reduction of the workload for the editors in the field of SDH and AD be made. Thus, there are still research desiderata that have to be investigated. Furthermore, the outlined implementations could have a positive impact on accessibility and hence achieve progress in regard to a more accessible media landscape.

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Bernd Benecke

Methods and Technologies of Audio Description for Film and Television

1 The problems of creating a text for audio description

An audio description is a set of techniques developed predominantly for blind and visually impaired people, in which the visual information of audiovisual material (film, play, opera, etc.) is transferred into a written text that is then presented acoustically (see also Benecke 2014a: 1 f.). The resulting product is called an *audio described film*, *audio described theatre performance* or *audio described opera*. The text created from the visual information should not interfere with the still available acoustic information of the original product. It has to be expressed in a way that dialogue as well as important music and sound effects (for example the arias in operas) are not compromised. That means it has to be slotted into the available breaks.

The author, in the following referred to as the describer, is therefore confronted with some striking problems:

- **When** can the text for audio description be best integrated in the available breaks between dialogues, music and sound effects? The interaction of acoustic information is of great importance and is very often underestimated. However, it is precisely the audio track that can help the describer as a lot of the visual information is also conveyed through audio (Benecke 2014b): In many films, an *emotional dictionary* of important characters or places is created. That means that for example important people have a musical theme, which is played every time they appear. Or places have a specific *sound design* of noises and sounds that make the place immediately recognisable.

In those cases, audio description is not necessary. Music also plays a crucial role when it comes to establishing a certain mood or conveying emotion, provided that it is *empathetic* music – music that supports the visuals (in contrast to *anempathetic music* that opposes the visual content, see also Chion 1990). But sounds can also cause problems for audio description. Many films create an audiovisual dissonance (ibid.), which means that something different is conveyed acoustically than what one can see on screen (example: the soft voice of a narrator while showing dramatic images).

- **How** must audio description texts sound in order to correspond to the tone of voice used in the original and to fit perfectly into the acoustic information? This is a question about the choice of words, syntax and grammar and of course the chosen linguistic register. This will naturally differ between a sophisticated literary adaptation and an animation or action film, although this does raise the question of whether a more vulgar linguistic register in dialogues of a film must be represented in audio descriptions.
- **What** parts of the extensive visual contents have to be represented in audio descriptions in order to turn spoken text and sound into a coherent product? This selection process is usually the most extensive and demanding task for the describer. First, they have to concentrate on clarifying the following points: Where are visual contents located, temporally as well as spatially? In short, it concerns the question: Where and when (regarding the time of day) are things taking place? After that, they need to establish who or what is present – which people, which important items or buildings etc. And lastly, the question concerning the possible plot: What is happening in the visual part of the original product? What needs to be included in the text?

As Chapter 4 of this article also deals with why a description is necessary, this will not be discussed at this point.

2 Solutions based on national guidelines and rule sets

Over the course of the last years, national guidelines and rule sets were compiled in order to clarify the questions listed in Chapter 1. Examples are the *ITC Guidance on Standards for Audio Description* from the UK or the Spanish *Requisitos para la audiodescripción* (AENOR). In Germany, rules concerning audio description were first established in 1997 and revised in 2004 (Dosch/Benecke 2004). The latest sets of rules for audio description were introduced in 2015 by the public broadcasters of Germany, Austria and Switzerland and are binding for all audio described films on their channels (available on the "Barrierefreiheit" page of www.ndr.de). In addition, they are intended to be taken into consideration for audio descriptions of cinema films.

A number of publications (Vercauteren 2007, Puigdomènech/Matamala/Orero 2010, Rai, Geening, Petré 2010) take a closer look at, and compare, different guidelines. They generally came to a surprising result: Although audio descriptions are quite different in terms of style, vocabulary and presentation across different countries (and even within German-speaking countries), which highlights the cultural component of a country's audio description (and adds an interesting component to the question of translatability), existing guidelines have similar standards. This does not only affect the basic rule of only allowing audio descriptions in-between dialogues and important music and sound effects but also the demand for answers to the aforementioned where/who/what questions. There is also a consensus when it comes to questions of details:

- Main characters and important places should receive an in-depth description in an appropriate spot.
- Mentioning colours as well as explaining ambiguous sounds are also part of audio description.
- Writing on buildings or signs and overlays must be included in the description, as well as the *credits* at the beginning or end.
- Subtitled sequences receive a voice-over, which is spoken either by the narrator of the audio description or (depending on the film) by one

or more additional voices. The same applies to subtitling in theatre or opera.
- Audio descriptions should not explain, judge or interpret.

The more formal standards, which are important for the how, are also similar in most cases. For example:

- The audio description text is written in the present tense.
- New terms are introduced with an indefinite article.
- Technical terms can be used but they have to be introduced and explained.
- Technical film terms are omitted, rather their effect is to be described.

Despite there being similar requirements for audio descriptions, especially in Europe, different descriptive styles and techniques were able to blossom, which shows that guidelines are written and discussed but that they only play a secondary role in everyday life, since the requirements provide the describer with a lot of flexibility. Therefore, it was essential to look at audio description from a European point of view. This took place in 2011 within the EU-funded research project ADLAB (Audio Description Lifelong Access for the Blind), which will be presented in the next chapter.

3 Strategy instead of rules: The ADLAB Guidelines

Applied for and led by the University of Trieste, the EU-funded project took place from October 2011 to September 2014 (www.adlabproject.eu). In addition to universities from Portugal, Spain, Belgium and Poland, the public broadcaster VRT for Flemish television in Belgium as well as the Bayerische rundfunk from Germany took part in the project. Initially, as indicated in Chapter 2, the project concentrated on achieving a European overview of the different activities and main points in the field of audio description. The final report (ADLAB 2013a) is available on www.adlabproject.eu and can be found in the section "deliverables". It provides the greatest resource of informational material on audio description in

Europe to date. Another so-called "work package" deals with the varied analysis of an audio description text (for this, the American block buster "Inglorious Basterds" by Quentin Tarantino was chosen); the results of this analysis have since been published in a book (Maszerowska/Matamala/Orero 2014).

This was followed by the first Europe-wide test on the preferences of the target group. Audiences consisting of blind and visually impaired people in the participating countries were shown different versions of the audio description (in their respective languages) of two scenes from "Inglorious Basterds". Afterwards, they were asked some questions in a survey concerning the comprehension of the scenes and their preferences. These research results are very informative: The general consensus was that the names of the actors should be presented with the characters they play during the opening credits of the film, with the same being done for the names of the author and voice actor. However, there was some disagreement when it came to the following points: should written text on screen be explicitly announced and how, and when should a film character be introduced by name.

> The respondents' preferences were as follows: actors' names should be given along with the characters they play in the opening credits (presumably to strengthen character identification), names of the AD author and the AD voice talent should be read out in the opening credits. There were no clear preferences as regards information sequencing and fragmentation as well as description/narration. The results were inconclusive in the case of announcement of text-on-screen and character identification, as neither the explicit announcing of text-on-screen or the lack of it nor naming characters immediately or only if introduced in the film had a significant effect on the replies to comprehension/information recall questions. (ADLAB 2013b)

To conclude the project, European guidelines were established for audio descriptions. Thanks to the discussion of the results of the text analysis and the target audience tests, it showed that strict guidelines and directives did not seem very productive or user-friendly. In the German translation, they are still called "Richtlinien" (guidelines), which, in the context of the project, are to be

understood as strategies and suggestions for recurring problems, rather than strict rules. A detailed analysis is required for this as well:

> This analysis consists of a close examination of the source material, including background research about the text and its production. […] All the decisions you make regarding the AD will always be co-determined by the particular context in which a given narrative event (e.g. the introduction of a character) occurs and often there will be more than one option regarding how to describe it. The purpose of section 2, AD scriptwriting, is to help you make your own decisions and identify appropriate strategies. Each chapter in this section is dedicated to one particularly thorny issue regarding AD scriptwriting (Characters and action, Spatio-temporal settings, Genre, Film language, Sound effects and music, Text on screen, Intertextual introduction: basic audio description concepts 17 references, Wording and style, Cohesion) and follows the same basic structure. (http://www.adlabproject.eu/Docs/adlab%20book/index.html#intro)

The ADLAB guidelines derive from a university setting and have a linguistic style that differs from the guidelines that were developed from practical experience and that were mentioned in Chapter 2. Because of this completely new approach, the ADLAB guidelines can offer even an experienced describer new perspectives and strategies, which would normally be overlooked by describers in their daily audio description work. This is also true for the Audio Description Evolution Model ADEM (discussed in the next chapter), which is based on scientific theories of translation and intertwined with the long-term experience of audio describers.

4 Audio Description Evolution Model (ADEM)

Compared to the rule sets and strategies for writing an audio description text as mentioned in the previous chapters, the Audio Description Evolution Model (Audiodeskriptions-Entwicklungsmodell, ADEM) is very different (Benecke

2014a: 43–44). This model uses experience (among other things the importance of the analysis of sound discussed in Chapter 1) and combines it with the "Methoden des wissenschaftlichen Übersetzens" (Methods of Scientific Translation) by Gerzymisch and Mudersbach (1998).

In order to do this, the question of **why** needs to be added to **when**, **how** and **what**: Why is something being described? To this end, Benecke (2014a) draws on the term *experienced impression* (Willi Bühler 1937: 153–154). ADEM, therefore, is based on the assumption that the describer has had a specific experience or an *experienced impression* when looking at the original, which he or she wants to pass on to blind and visually impaired audiences with the help of audio description.

This embeds audio description in the context of translation studies and considers it a *partial translation* (Benecke 2014a: 44), on the basis that we have a coherent original product consisting of picture and sound – the film without audio description. Over the course of the audio description process, the visual information is translated into (spoken) text information, whereas the audio information stays mostly the same. Both the spoken text and the unchanged audio have to fit together coherently in the target product, which means the original is only translated partially and the non-translated segments have to form a logical unit with the translated segment. Based on the organon model (Karl Bühler 1934: 28), Benecke comes up with three communication models that describe and visualise the steps of the audio description process (Benecke 2014a: 49–50).

These preliminary considerations are followed by a methodical implementation consisting of the following steps:

The underlying goal of action of a describer is to convey to a blind or visually impaired audience through audio description the describer's *experienced impression* when she or he was watching the original product. In order to do this, there are three questions to be answered beforehand:

1. Who is the anticipated recipient of the audio description? What requirements do the blind or visually impaired audience bring along for the understanding of the audio description? It could be a film for children, who might have (because they have been blind since birth)

no or only a small image memory – in contrast to an adult, who was sighted for years and therefore can still remember a lot through his or her memories. It could be a play intended for a demanding and informed adult audience etc. The intended recipient has a big influence on the required amount of information in an audio description.

2. What are the requirements and restrictions for sound? This question deals with the questions from Chapter 1 on alleviations through the *emotional dictionary* and *empathetic music* or additional hindrances through *audiovisual dissonance* or *anempathetic music*.
3. What is the overriding "meaning" of the original from the describer's point of view? This question is associated with the *experience* or *experienced impression* of the describer: what is the original about from the describer's point of view? For example, the film "The Lives of Others" can be understood as a film about the German Democratic Republic (GDR) during the 1980s but also as a film about the failure of an actress in the political system or about the transformation of a Stasi agent to a "good man". All are right but the choice of one of these possibilities changes the content of the audio description. This interpretation can be formulated as a *knowledge system* or *holon*, according to Gerzymisch and Mudersbach (1998). Such a holon provides a better overview and is also needed for step 6. An example for a holon for the film "The Lives of Others" can be found in Benecke (2014a: 89).
4. After taking a look at the original as a whole and clarifying the question what the describer thinks it is about, the individual sequences of the description are examined in detail. For a film, this would be the description of the single scenes of the film. These should be closely analysed and the results listed in a clear and concise manner. Completing an *aspect matrix* lends itself to this, according to Gerzymisch and Mudersbach (1998). This is a table that vertically features the scenes in chronological order and the most important aspects of the film that have an influence on the audio description horizontally. Such aspects are, e.g., the length of dialogue breaks and the intensity of the plot, which needs to be verbalised during the dialogue

breaks. Furthermore, it can be noted whether there are important sound and music cues in the scene, if names of people or places are being mentioned, whether there are ambiguous sounds or the like. The entire *aspect matrix* for "The Lives of Others" can be found in Benecke (2014a: 91 f.).

5. While interpretation and *aspect matrix* can be easily integrated into the practical work of audio description (see Chapter 5), it seems that creating so-called *synchronic visual maps,* proposed by Gerzymisch/Mudersbach (1998), is not very convenient in practice. Although such a map can offer important information regarding the plot and relationships within the original, the practical creation of it takes a lot of time, which means the effective advantage is limited. In Benecke (2014a: 96) a *synchronic visual map* can be found for the film "The Lives of Others", which visualises an important contextual connection (a red colour ribbon causes red fingerprints on a Stasi report, which reveals the Stasi man as rescuer). But it can also be seen that such a map takes a lot of effort to create, especially for an entire film.
6. Now, the *holon* created in step 3 will be intertwined with the *aspect matrix* of step 4 to form a diagram that visualises which subitems of the holon are found in the sound, or in the picture or in both. This allows the describer to draw swift conclusions about what information is important for the audio description within this interpretation and aspect analysis – because it is only the information that appears in the image. What appears in the sound can be ignored for the audio description – but elements that only appear in the image are of particular importance for the audio description.
7. How the important parts identified in step 6 will be incorporated into the audio description is presented in the *action diagram of the plot* (Benecke, 2014a: 68–69). It is a flow chart that assesses how and where an important detail can be added to the audio description. This detail then passes through a number of instructions, which can be answered with *yes* or *no*/*sometimes*. For example, instruction A asks again about the appearance of the detail that has to be described

> in the soundtrack. This is followed by, for example, questions about the appearance in a so-called *coherent description* (a spontaneous first audio description, which allows the blind or visually impaired audience to achieve a coherent understanding of the film) or the physical possibility to add the description of the detail to a concrete place in-between dialogue breaks. The flow chart also allows the addition of an important detail with the help of the so-called *intended hyper description* (Benecke 2007; 2009). This is used if an important detail cannot be implemented in the same place as the visual equivalent in the audio description due to reasons of space, and searches for a place in the original, where the information can be coherently implemented in the audio description, even though there might not be a visual counterpart to it. One example is the aforementioned important hint to the red ribbon in "The Lives of Others". It is only visually depicted once in the film and at a moment that does not allow for an audio description. With the help of an *intended hyper description* and the use of the *aspect matrix,* it is possible to identify the scenes in which the typewriter can be seen and a big enough dialogue break is available in order to introduce the red ribbon in the audio description, even though the detail cannot be seen on screen.

Similar flow charts help with the description of formal features (black-and-white film, flashback, slow motion, etc.), the naming of characters and places or the identification of long dialogue breaks in order to describe important characters and places more comprehensively (see Chapter 1).

ADEM acknowledges the individual component when providing an audio description; furthermore, ADEM facilitates comprehension of the steps taken and the decisions made in a later analysis of the audio description.

Lastly, ADEM also introduces a didactic perspective. The training of describers rests on a concrete course of action, which introduces the trainee to the requirements of creating an audio description step by step. The last chapter deals with the impact ADEM has had on the training of new describers in the real world.

5 The impact of guidelines and ADEM on the training of new describers

The presentation and discussion of guidelines is often an integral part in training seminars and training units for audio description. To what extent this applies to the ADLAB strategies mentioned in Chapter 3 is still debatable. The audio description development model ADEM presented in Chapter 4, however, is part of the training of new film describers and has proven successful so far. ADEM is a fixed item on the agenda in seminars for audio description at the *University of Applied Languages* at the SDI München (*https://www.sdi-muenchen.de/kurse/seminare-training/film-uebersetzung*):

On the first day of the seminar, the participants work on the basis of a general introduction into the topic and discuss the guidelines. This is usually conducted with the help of a less complex film example like a short clip of a TV show. The findings are discussed and – if possible – compared to a professional audio description of the clip. On the basis of these first practical experiences with audio description, there will be a thorough introduction to the ADEM model and method on the second day.

The participants receive a second more complex film clip, usually from a cinema film, and are asked to create a *holon* and *aspect matrix* after seeing the clip once. The extent to which the *holon* will be formulated in the end depends on the progress of the seminar and the individual work pace of the team. The describers are required to have the chosen *holon* available for the text production and to consider it so that the *holon* can have a noticeable impact on the text of the audio description. This applies every time decisions have to be made on what part of the content the audio description will focus due to the short dialogue breaks. An example from practice:

The future describers received the first 20 minutes of the film "Inglorious Basterds" to work on and were asked to create a *holon* for those 20 minutes and use it for a description. A short summary of the 20-minute clip: The SS officer Landa pays a visit to Monsieur LaPadite and his daughters in occupied France in order to ask about the whereabouts of a Jewish family from the area. During a long conversation, Landa puts LaPadite under so much pressure that he caves and reveals the hiding spot of the family under the floor of his house. The *holons*

from multiple seminars using this clip can mostly be put into two categories: "The fear of the LaPadite family" and "The threat caused by the Nazis".

A team of describers who chose the first *holon*, offered the following audio description for a sequence at the beginning of the clip:

> The father looks at the vehicles. He wipes his forehead and beard with a dirty handkerchief. His clothes are worn out. The father looks sorrowfully out of dark blue eyes and goes to the house.

Another team chose the second *holon* and offered the following description:

> The father lowers his gaze. The escorted limousine has almost reached the house. While the vehicles drive up, he cools his face and neck with water. The military vehicles, two motor bikes and a car, reach the hill of the house. […] Three soldiers face the colonel, who sits in the back of the open car.

Similar differences can be found in another part of the clip:

> The daughters, one blonde, two brunette stand solemnly and silently with clasped hands in the room. (from the team with the holon The Fear of The LaPadite Family)

> Colonel Landa wears a long leather coat and carries a briefcase. He has an angular face and an intense stare (from the team with the holon The threat caused by the Nazis).

In both cases, the describers had to decide what information they want to convey in the short dialogue break in order to give the blind or visually impaired audience the same *experienced impression* as themselves. This decision was made by choosing the *holon*. This example illustrates how the even unconscious decision of a *holon* can push the audio description in a certain direction and in this case, this means focusing on either the fear of the threat-

ened family or (which might be the better choice for the film as a whole) on the threat of the Nazis and especially the respective colonel.

But completing the *aspect matrix* can also make the work of the describers easier, which is already shown in the relatively short 20-minute sequence of the film. The *aspect matrix* allows the rapid identification of parts of the film that pose a bigger challenge due to short dialogue breaks and an intense storyline (and might need the help of the *holon*). Names and descriptions of important characters (in this case especially SS colonel Landa) can be noted and used for a later scene in the film.

ADEM can therefore take a complementary role in the training of new authors. In order to analyse an audio description, *holon* and *aspect matrix* provide hints for the trainer as to why a description took place the way it did.

The interaction between the rule sets and guidelines (Chapter 2), of the ADLAB strategies (Chapter 3) and of the ADEM method (Chapter 4) offers the describer a broad spectrum of possible solutions for the problems in producing an audio description text mentioned in Chapter 1.

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Nathalie Mälzer and Maria Wünsche

Audio Introductions

1 Introduction

Audio introductions provide additional auditory information to audio-visual media texts and can be listened to before watching a film or performance. Audio introductions have been around since the 1980s. They were first trialed in the US but have also been established in Europe since the early 1990s (see Di Giovanni 2014: 1). In the beginning, they were mainly used in the performing arts, i.e. for opera, ballet and theatre performances (cf. Orero/Matamala 2007: 7 f., York 2007, Weaver 2010, Fryer/Romero-Fresco 2014: 11). Following the initiative of Fryer and Romero-Fresco in 2013 (cf. Romero-Fresco/Fryer 2013, Di Giovanni 2014, Hammer et al. 2015), audio introductions are now also for being created films and documentaries.

Introductions to works of art such as musical or theatre performances have been known for some time. They precede the performance and are either presented live or accessed as an audio file on the websites of theatres (see Schauspiel Frankfurt or Deutsches Theater Berlin). Introductions of this kind, which are also called audio introductions, are intended for a heterogeneous audience. The type of audio introduction discussed in this article is specifically created for a blind and visually impaired audience. However, this does not necessarily exclude a broader target group. Fryer and Romero-Fresco (2014: 26) underline that these audio introductions can be used as an additional offer of information by audiences without sensory impairments. In terms of content, audio introductions and introductions to art performances resemble one another: Both types of introductions offer a summary of important information on for example, plot, background and formal aspects of a film, opera performance or theatre production (cf. Benecke 2014: 21 and Orero/Matamala 2007: 7 f.). Audio introductions are considered complimentary material to the audio description

of a film (Di Giovanni 2014: 1) or a play (cf. Szarkowska/Jankowska 2015: 261). In addition, further accessibility options may be offered as well. These offers include, for example, touch-tours in the theatre for people who are blind or visually impaired (Orero/Matamala 2007: 11; Fryer 2016: 160). The tours are provided by some theatres prior to the performance, offering the possibility to access the stage and touch the scenery, costumes and props. Experiments have also been carried out in cinemas, where objects related to characters or plot elements in films were distributed for blind or visually impaired audience members to gain further information about the film, either via sense of touch or even through senses of smell and taste (cf. Jüngst 2016). Audio introductions are mostly listened to prior to the reception of an audio-described film or theatre performance. In terms of content, they focus more on the visual style (the how) rather than on the plot (the what) (cf. Di Giovanni 2014: 2).

This article provides a description of text type characteristics of audio introductions and addresses their key functions (part 2). In addition to the content structure of audio introductions (part 3), different areas of application and their technical implementation are introduced (part 4). Part 5 addresses central linguistic features of audio introductions. Part 6 provides an overview of remaining research gaps.

2 Features and Functions of Audio Introductions

An audio introduction is a text that is conveyed auditorily and that is spoken by one or more persons. It has a length of about 5 to 15 minutes (Fryer/Romero-Fresco 2014: 11). The text can be provided to audiences either live or as a pre-recorded audio file. In the latter case, the text can be quite elaborate and contain multiple speakers, sounds, music or quotes from the media text that the audio introduction refers to (Fryer/Romero-Fresco 2014: 11). Audio introductions are usually neither chronologically connected to nor embedded in the original text; instead, they form an independent, self-contained metatext (cf. Fryer/Romero-Fresco 2014: 12).

Audio descriptions (see Benecke in this volume), in comparison, are partial, intersemiotic translations of an artefact, or, according to Benecke (2014),

partial translations that are chronologically connected to as well as (in the case of films) embedded in the original text: They consist of non-cohesive verbal text elements that are received simultaneously to the corresponding original text. Visual, non-verbal elements of an audio-visual product such as a film or a play, to which blind or visually impaired audience members have limited or no access, are translated into acoustic and verbal signs. This additional information is conveyed in-between the dialogues of a film or a play. Music and sounds that are plot-relevant are not talked over to ensure that the original text can be experienced fully, and that the audio description does not suppress important information. As a consequence, there is less space available for audio descriptions than would be necessary in order to optimally describe all the important visual details of a film or theatre performance.

When choosing the elements they want to describe, audio describers must therefore limit themselves to narrative aspects at the visual level of a film or performance that are essential to understanding the plot (cf. Remael/Vercauteren 2007). Such aspects are, for instance, descriptions of the setting, the characters and their physical appearance, as well as descriptions of their actions and reactions (cf. Benecke 2014: 16 f.). As a result, aesthetic aspects or background information are often neglected (Benecke 2014: 21). Benecke therefore includes the audio introduction in his audio description development model (Audiodeskriptions-Entwicklungsmodell, ADEM) where it can be used as a last resort for cases in which it is not possible to include all the relevant information from a scene in the audio description of a film (Benecke 2014: 78 and 84). The interplay between an audio introduction and the existing audio description plays an important role in the creation of these two elements. Benecke therefore pleads for authors of audio descriptions to also create the respective audio introduction (cf. ibid. 21).

It would, however, be a misconception to consider audio introductions simple workarounds. Audio introductions cannot give advance plot indications to solve the challenges that occasionally occur in audio descriptions for film and television. Their function is rather to provide a blind or visually impaired audience with further information about the artefact, such as information that is either not compatible with the time constraints or that is regularly neglected in audio descriptions. Various empirical studies suggest that the comprehen-

sion of an audio described film may be significantly improved if audience members also listened to the audio introduction (cf. Fryer/Romero-Fresco 2014: 13 f.).

Furthermore, audio introductions may also help to diminish barriers even if no audio description exists for that artefact yet.

According to Remael/Reviers (2013) and Fryer/Romero-Fresco (2014), audio introductions have several text functions. Their main task is to provide a better understanding of audio-visual artefacts. Consequently, audio introductions are primarily informative, because they provide general facts about the production of a film, a play or opera production, about the duration of the piece, the names of actors and characters or about the filming locations, setting, scenery and costumes. Descriptions of aesthetic features of a film or performance may also be added.

Audio introductions can also contain self-referential instructions for the audience, if, for instance, there is information on how to play the audio file (cf. Remael/Reviers 2013 and Fryer/Romero-Fresco 2014: 11). Finally, they are intended to inspire the audience to watch the film or to visit the performance they refer to (Fryer/Romero-Fresco 2014: 12).

3 Contents of an Audio Introduction

How are audio introductions generally structured? Due to fewer time constraints, audio introductions can convey information about an artefact that not only pertains to its narrative level. Therefore, our focus lies and as mentioned above, on the stylistic characteristics and background information provided in audio introductions. To this day, there are no specific guidelines or recommendations in German-speaking countries that prescribe which information should be included in an audio introduction. Based on existing audio introductions, we can, however, draw conclusions for practice. As a principle, the contents and structure of audio introductions always depend on the film or performance it is referring to.

Examples of German-speaking audio introductions in films are available on the website of the University of Hildesheim (cf. Universität Hildesheim

n.d.). Contrary to what has been stated before (Fryer 2016: 155), the audio introduction to the movie "The Wall" (Pölsler 2013) is not available on DVD. Nor is it a translation from English into German (Fryer 2016: 155), but an original text created by students of the master programme "Media Text and Media Translation" (German: Medientext und Medienübersetzung). This text was later translated into English and has since been made accessible online.

In terms of content, a distinction must be made between audio introductions for theatre and film.

Audio introductions for theatre or opera mostly contain relevant information from the printed programme. They provide information on the duration of the performance and list the names of actors and the production team. In addition, set design, costumes and characters are described. Furthermore, the style of a production and aspects such as acting or directing style may be included (cf. Romero-Fresco/Fryer 2013: 289). Fryer also recommends addressing moments in the performance which may be frightening for blind or visually impaired audience members. These might include sudden loud noises such as shooting or effects that are difficult to contextualise, such as the use of fog machines. Strong lighting effects such as strobe lights are also included in this list (cf. Fryer 2016: 158), because people with visual impairments may nonetheless perceive them, potentially causing them to interpret these effects as a source of danger.

The contents of audio introductions for films are comparable to those for theatre performances. They usually include descriptions of characters, filming locations and, if available, information about the (literary) original work. Background information about the director, the screenwriting or awards may also be included. Furthermore, a description of cinematographic features, e.g., camera work, editing, light and colours is desirable since these features are mostly banned from audio descriptions (Fryer/Romero-Fresco 2014: 12). The target group has repeatedly expressed a desire to be informed about existing film reviews. However, so far, this has not been realised (cf. Hammer et al. 2015, Fryer/Romero-Fresco 2014).

Romero-Fresco and Fryer (2011: slide 13) recommend the following structure for an audio introduction: A short introduction, followed by a synopsis,

explanations about the visual style and descriptions of characters and locations, followed by background information about the cast and production team.

3.1 The Introduction

When listening to audio introductions produced in the UK or Germany, it can be noted that, aside from a greeting and a self-referential indication about the text type, the title of the film is stated first. There is also a note whether on an audio description is available (cf. Fryer/Romero-Fresco 2014: 23). Informing the listener about the duration of the audio file may be important as well and should be mentioned at the beginning. The director of the film and the release year are also regularly included.

3.2 The Synopsis

The presentation of the storyline should not be too detailed (Fryer/Romero-Fresco 2014: 22) as audience members may view it as an unnecessary spoiler or may feel that it undermines the suspense in the film or performance. It may, however, be difficult to fully forego information about the plot. Without mentioning the basic narrative framework, initial conflict or individual character constellations, it is difficult to connect information about locations and characters in a meaningful way. Results from an empirical study suggest (Fryer/Romero-Fresco 2014: 13) that information about characters is better processed and remembered if it is presented in a logical or narrative context instead of as a mere list. The synopsis itself is therefore not an end in itself but serves as the structure for further information about characters and locations.

In formulating the synopsis, it is also discussed whether content redundancies between audio introduction and audio description should be viewed as an advantage or a disadvantage. Redundant information in an audio introduction may be perceived as a boring spoiler. However, it seems reasonable to provide the audience with several "anchor points" for the audio description of the film or stage play by deliberately using repetitions (cf. Hammer et al. 2015: 166).

3.3 Character Descriptions

The description of characters may follow the chronology of their appearance or may be arranged according to their plot relevance. Physical features, which may

change throughout the film or performance, might include facial expressions, gestures or proxemics, i.e. the characters' spatial behaviour (cf. Fryer/Romero-Fresco 2014: 18). Such aspects can be described in general or in the form of an example using a scene or setting. Casting may also be significant and therefore noteworthy, for instance, if several characters are played by the same actor, if the cast seems unexpected or if famous actors have a new dubbing voice in German and may therefore be not recognisable by a blind or visually impaired audience. Sometimes, it can be challenging to choose which characters are described. If there are a lot of actors and extras, which is quite common in historical film productions, the authors of the audio introduction may be guided by the question of who plays an important role. Grouping people together who appear in similar scenes or act similarly can also be beneficial. It could also be challenging to choose which information about a certain character should be included. In a crime drama or thriller productions, a character's identity may be deliberately concealed, or the audience might deliberately be deprived of relevant information.

3.4 Locations

The description of locations may be more or less elaborate, depending on the genre. However, Di Giovanni notes that location descriptions are less frequent in an audio introduction because this information is mostly available in the audio description (cf. Di Giovanni 2014: 5). As in the case of character descriptions, it is recommended to use formulations from the audio description in the introduction. This can prove helpful when information from the introduction needs to be retrieved while watching the audio described film. Finally, location descriptions can also include background information on the actual filming locations.

3.5 Visual Style

Some audio introductions do not start with descriptions of characters and locations, but rather describe the visual style of the film. Which elements are included depends on the film on which the introduction is based. Relevant information can include aspects such as editing, colour scheme and light design as well as main camera settings, perspectives or movements. The description

of slow-motion scenes, time lapses, split screens or special effects may also be included in an audio introduction. In cartoons and animated films, further stylistic aspects might be added.

Interesting background information or references to intertextual or interpictorial references can be provided as well, since these aspects are typically not included in audio descriptions. These aspects can be retrieved from film reviews and may be mentioned in the audio introduction after the facts have been verified (cf. Fryer/Romero-Fresco 2014: 22).

Ultimately it will depend on the film or performance and on the authors' decisions, which information is included in the audio introduction, in which order it is presented, which aspects are emphasized and how long the introduction will be (cf. Fryer/Romero-Fresco 2014: 17).

Currently, audio introductions are offered as single continuous audio files. In an empirical study, one suggestion from the target group was to provide different versions (cf. Hammer et al. 2015). Apart from a short version, there could be a detailed version containing further information such as press reviews. An audio file containing individual chapters could allow the users to decide which aspects they wish to have more information about and which information they would rather access after the film or theatre performance. The option to access individual chapters should then be mentioned at the beginning of the file to ease navigation within the file. If a trouble-free navigation can be guaranteed, the overall duration of an audio introduction will play a less important role, since it would be possible for users to skip parts of the text that are less relevant to them.

4 Areas of Application and Technical Implementation

In live contexts, audio introductions may be presented to the audience directly or they may be made available as a text or audio file before the performance (cf. York 2007: 216 f., Di Giovanni 2014: 2). They may also be sent directly to audience members or uploaded on a website. Audio introductions for films can also be provided as audio or text files. An important question in this context

is whether potential users can actually find these files. Broadcasting an audio introduction prior to the programme, as is done in theatres, is not possible for audio introductions created for a film on television (cf. Fryer/Romero-Fresco 2014: 12). Offering the audio introduction on the broadcasting companies' website may be a solution. For instance, Northern German Broadcasting (Norddeutscher Rundfunk, NDR) produced an audio introduction created by the University of Hildesheim for the film "A Girl Walks Home Alone at Night" (Amirpour 2014). Several days before broadcasting, the audio introduction was made available online (cf. NDR n.d.). The audio introduction is still available on this website. It is, however, improbable that audience members who want to watch this film on DVD or at the cinema will actually look for the audio introduction on the website of NDR. A website that gathers audio introductions and makes them available for audiences as text and audio files (such as audiointros.org, which is no longer in operation) would be a welcome initiative. Especially for German-speaking countries, this could further enhance the availability and access to audio introductions for potential users. In this way, audio introductions could be listened to regardless of broadcasting dates. In the empirical study by Hammer et al., the target audience suggested making audio introductions available through apps such as GRETA (cf. Hammer et al. 2015: 174). GRETA (cf. Greta n.d.) provides audio descriptions for feature films that can be connected and subsequently synchronised with the film via smartphone. Furthermore, it is important to make audio introductions available in media libraries of television channels, especially if the film is scheduled to be broadcasted soon and if the audio introduction was produced by the television channel. Audio introductions for theatre performances may be provided via the theatre's websites. Fryer and Romero-Fresco (2014: 26) suggest making audio introductions available as bonus material on DVD.

In addition to the difficult question of where to provide and/or access audio introductions, there is also the question of production of further audio introductions for film and television. It has been emphasised that production costs for this text type are lower and that the production process is less complex compared to that of audio descriptions (cf. Fryer/Romero-Fresco 2014: 27). However, this applies mainly to studio recordings and with regard to copyright

questions. Writing an audio introduction still requires considerable effort and profound knowledge of film or theatre analysis. Although there are different time constraints for both text types, the linguistic challenges when creating audio introductions are in no way inferior to those for audio descriptions.

5 Linguistic Features

Currently, there are no guidelines on how to write audio introductions in German-speaking countries. By using British research literature and audio introductions that have been developed in Germany, we are nonetheless able to compile important aspects. It should be noted that audio introductions are texts that are conveyed auditorily. Fryer/Romero-Fresco (2014: 23) therefore stress that "All [audio introductions] must be written for the ear." Auditorily conveyed texts are fleeting. Therefore, main clauses and active present tense are prioritised. Fryer/Romero-Fresco (ibid.) also suggest writing the text in first person plural to create a closeness between speakers and users. However, most audio introductions do not follow this specification. In addition, complex sentence structures, e.g., inserted relative clauses are avoided. In terms of lexical style and choice, we see a tendency towards concise and expressive wording while redundancies are avoided. An audio introduction may not be subject to the same time and space constraints as an audio description, but it is still important not to overstrain the attention of the users.

In terms of technical vocabulary, there is contradictory information in the research literature. While Weaver suggests that technical terms should be avoided in theatre and opera to retain the performative and narrative character of an audio introduction (cf. Weaver 2010: 5), Fryer (2016: 159) is in favour of using technical vocabulary, e.g., in ballet performances for specific dance steps. Empirical studies have shown that the use of specific vocabulary in audio introductions for films to describe camera work, film editing or lighting is requested by most of the users (cf. Fryer/Romero-Fresco 2014: 25 and Fryer 2016: 159), particularly as their use in audio descriptions is controversial and they are excluded from most guidelines (cf. Perego 2014: 88). Di Giovanni

(2014: 5), however, states that the use of film-specific terminology is problematic in audio introductions and suggests conducting further empirical research.

6 Research Desiderata

Audio introductions have not yet been researched extensively within Accessible Communication. There are therefore several research gaps.

Research literature has repeatedly emphasised that the interplay between audio description and audio introduction has not yet been explored in empirical studies. This also includes the question as to whether the focus of audio descriptions and introductions on visual elements is sufficient to explain suggestive links between sound and image to a blind and visually impaired audience, or whether audio introductions should address this aspect as well. In terms of acceptance and design, it must be noted that previous studies have been carried out with a small number of participants. Statistically sound results that may also take into account the heterogeneity of the target group have not yet been obtained.

In terms of heterogeneity of the target group, there is also the question of what specific needs should be considered when creating audio introductions for visually impaired or blind children. There is also only little research on audio descriptions for children. Whether children like to use audio introductions and which linguistic features need to be used still needs to be analysed.

A recurring question is whether audio introductions are translatable, and if so, which translation strategies should be followed (cf. Di Giovanni 2014: 5). Fryer for instance advocates for the translation of audio introductions. She suggests that their lower cost and shorter production times (cf. Fryer 2016: 155) might help further spread the service. Several empirical studies on audio introductions have been carried out based on audio introductions that were translated from English into Italian or Polish. The introductions received very positive user feedback (cf. Fryer/Romero-Fresco 2014: 12). Background information about the film or performance may be translated into another language without difficulty. However, elements such as film reviews, information on voice actors, if applicable, and information as to whether an audio description

is available must be adapted to the target language and its culture. Deliberate anchor points between audio description and introduction, i.e. wording that can be found in both texts, will, however, be lost in the translation.

More loosely connected to audio introductions is the question as to whether this approach can also be applied to other audio-visual formats. Audio introductions could be created for television series as well, which would involve specific challenges concerning their serial and ongoing character. Regular adjustments to the audio introductions would probably have to be made. The strategies that could be used to create audio introductions for series have not been explored yet.

Finally, the question arises as to whether complementary text types of this kind could be interesting for different target groups, e.g. for people who are D/deaf. Complementary information to SDH (subtitles for the D/deaf, cf. Mälzer/Wünsche in this volume) could be designed as video introductions in sign language and could comment on the auditory elements of a film or a live event: music, sounds, voices, prosody – aspects that are regularly neglected in SDH.

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Nicola Pridik

Visualisation of Legal Content in Easy Language Texts

Legal knowledge has always been imparted through the spoken or written word (Röhl/Ulbrich 2007: 12). This is mainly because verbal language, due to its accuracy, clarity, unambiguity and ability for reasoning, is best suited to dealing with the abstract and, at the same time, complex subject that is law (cf. Bergmans 2009: 4 f.). However, when it comes to communicating legal structures, through which the content often first becomes accessible, even the best texts and presentations reach their limits. They often cannot exhibit the legal structures but can only describe them in a linear manner (ibid.: 7). Legal didactics therefore recommend the complementary use of legal visuals and concept maps (ibid.: 23, Eickelberg 2017: marginal no. 262 ff., Kostorz 2016: 70 f.).

Even Easy Language texts with legal contents reach their limits when it comes to presenting structures. It therefore makes sense to use comparable visualisations here. However, it should be kept in mind that legal concept maps not only facilitate comprehension, but also place special demands on their recipients. For example, they must be able to translate spatial arrangements and connections of text boxes into conceptual contexts (cf. Ballstaedt 2012: 51), recognise a non-linear reading direction and grasp the meaning of pictograms/icons in the respective context. For people with cognitive impairments or learning difficulties, these can be barriers that can complicate reception of the information. This article therefore addresses the question of what requirements legal concept maps must fulfil in order to be comprehensible to the widest possible group of people, which includes the target groups of Easy Language. The explanations are supplemented by three concept maps that show examples of what implementation could look like in practice.

1 Initial situation

1.1 Relevance of legal structures

Anyone who wants to impart legal information in text form has to complete three tasks:

- From the wealth of information on a topic, he/she must select those that are relevant to the target group in the specific situation. The considerations to be made in this context correspond to those on didactic reduction formulated, for example, by Kostorz (2016: 35 ff.) and Eickelberg (2017: marginal no. 133 ff.) for legal education.
- Contents must be put into words in an understandable way. This is equivalent to the characteristic of simplicity in the Hamburger Verständlichkeitsmodell (Hamburg Comprehensibility Concept) (Langer/Schulz von Thun/Tausch 2015: 22 f.).
- The contents have to be displayed in a structured way. The reason for this is that internal order and external structure in particular have an influence on comprehensibility (ibid.: 24 f., see also the contribution by Christmann/Groeben in this volume). This is particularly important for law, because it is largely accessible through its structures. Most legal provisions, together with the rules, guidelines, information and concepts they contain, are interconnected as parts of a structure, refer to each other or presuppose each other. This can be seen particularly well in procedural processes and systematics and also in legal models, i.e. representations that show how certain legal rules or institutions generally function, e.g. an assignment of a claim or a guarantee (cf. Bergmans 2009: 69). Those who know these structures will find it easier to orientate themselves in the law, to understand its contents and to retain them. In contrast, individual regulations in themselves often only seem to be useful.

1.2 Limitations of verbal communication of legal structures

Legal structures in texts can be conveyed in particular through a clear outline, appropriate headings, subheadings and a sensible paragraph structure (for

more on structured writing for lawyers, see Haft 2009). In addition, there is a logical overall structure of the text, a consistent communication of the information and its logical linking (Langer/Schulz von Thun/Tausch 2015: 24 and 69, Nussbaumer 2017, Christmann/Groeben in this volume). Nevertheless, a text as a medium always has a decisive disadvantage: It is not possible for it to present the structures. Even the most complex relationships can only ever be described in linear terms (Bergmans 2009: 7).

In the case of legal texts in Easy Language, the following dilemma, which Bredel/Maaß (2016a: 481 and 489 f.) describe in general for texts in Easy Language, adds to the difficulty: In order to achieve comprehensibility at the sentence and word levels, Easy Language is limited to a maximally reduced language system. At the same time, explanations are inserted into the text to compensate for missing linguistic and global knowledge. Both together, however, make comprehension at the text level more difficult, because the inner cohesion of the text is lost as a result. If the text contains legal information, this inevitably means that the legal structures are also out of the reader's field of vision. This makes it all the more likely that they will not understand the content despite the use of Easy Language.

1.3 Problem of illustrating Easy Language texts with legal content

Currently, many Easy Language texts are illustrated using the set of images of the Lebenshilfe Bremen (Lebenshilfe is a self-help association for individuals with mental disabilities and their families) (ibid.: 285). These are illustrations created especially for Easy Language texts, which have the character of images. They thus represent objects, persons, actions or scenes as a section of reality (Ballstaedt 2012: 20). For texts with legal content, this form of illustration has its limits, because law is abstract and cannot be depicted in this sense. Even if images can be found for individual aspects of the content, this will usually not be sufficient to implement a concept of illustration for the entire text. Ironically, for people who have difficulty reading, this often leaves only imageless texts with difficult-to-understand content to convey legal information (on the limits of the visualisability of abstract objects see Bredel/Maaß 2016a: 278 ff. and Alexander in this volume).

2 What are legal concept maps?

Legal concept maps provide information precisely where the medium of text is limited, namely in the visualisation of legal structures. Bergmans (2009: 21) and Eickelberg (2017: marginal no. 262) refer to them as 'Strukturbilder' (concept maps). Visualisations are realised as elements of text, form and picture are combined with each other, arranged spatially in a particular way and logically connected to each other. The recipient has to work out the structures and connections through syntactical analysis while reading the text, whereas looking at them in a concept map makes the structures and connections immediately obvious (cf. Ballstaedt 2012: 51, Ballstaedt does not refer to them as concept maps but as charts). Concept maps are therefore often easier to understand than information-adequate text (ibid.). They are also suitable for giving an over*view* of content in the truest sense of the word. As a rule, they do not stand on their own, but complement texts or are explained orally.

The examples on the following pages are intended to give an impression of what legal concept maps might look like in an Easy Language context. The respective version in colour as well as background information is available at www.npridik.de/visualisierung-recht-leichte-sprache.

On the legal concept maps in this article:
Figure 1: When you can no longer decide everything for yourself
The concept map explains the terms power of attorney, legal guardianship and Lasting Power of Attorney (LPA) and relates them to each other. In addition, the map contains an appeal to initiate a power of attorney or a LPA as early as possible.

Figure 2: Who gets your money and belongings after you die?
The concept map conveys to the viewer that he/she can influence the inheritance succession during his/her lifetime by making a last will or concluding an inheritance contract. In addition, he/she learns how the succession is regulated if he/she dies without making appropriate dispositions upon death.

Figure 3: Criminal procedure: What happens at a hearing?
The concept map shows how the hearing in the criminal court proceeds. Not only are the individual stages of the process named, but also the actors.

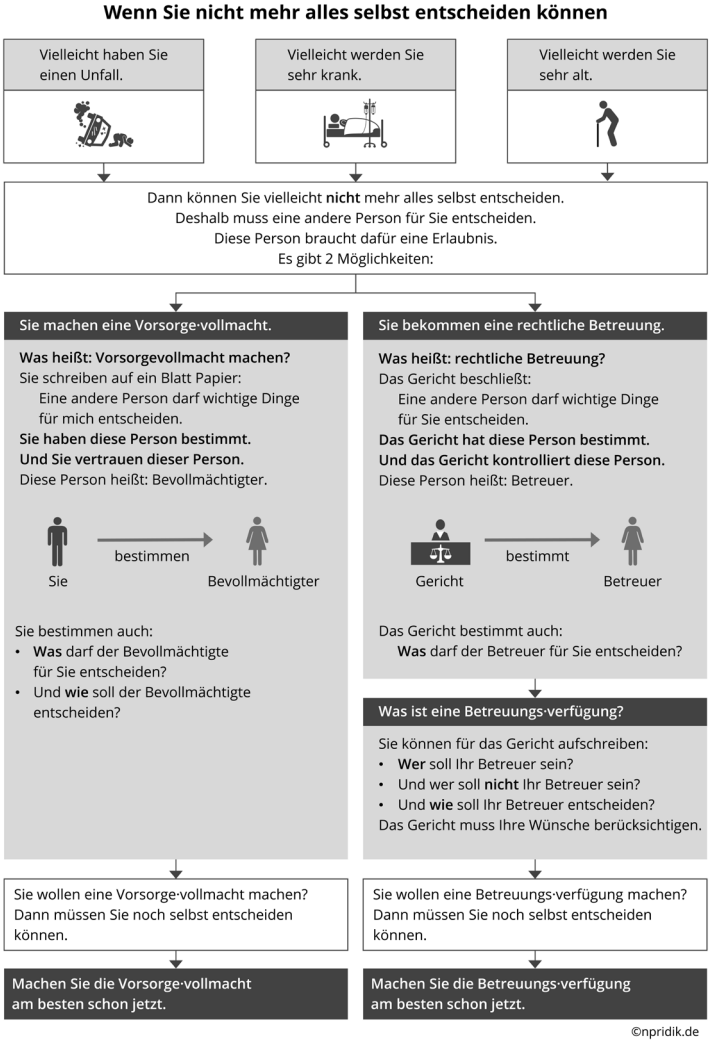


Figure 1: German concept map on power of attorney, legal guardianship and Lasting Power of Attorney (LPA) (version in colour: www.npridik.de/visualisierung-recht-leichte-sprache)

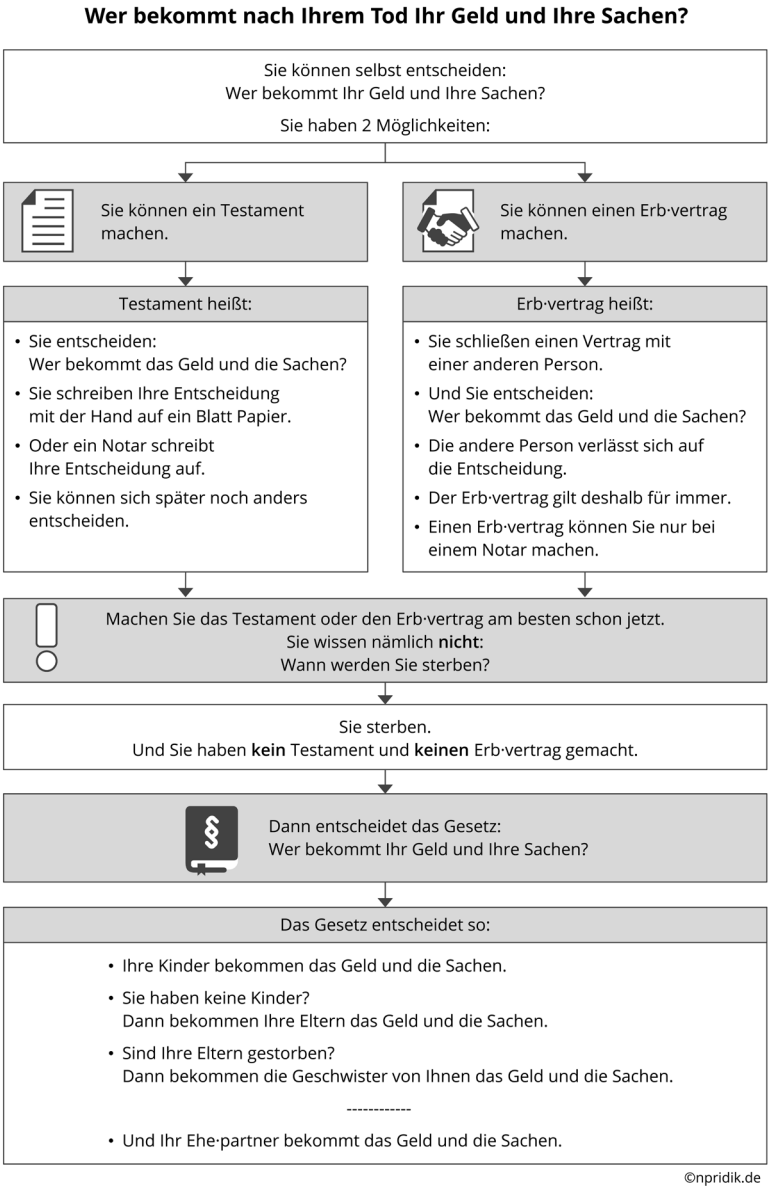


Figure 2: German concept map on inheritance succession
(version in colour: www.npridik.de/visualisierung-recht-leichte-sprache)

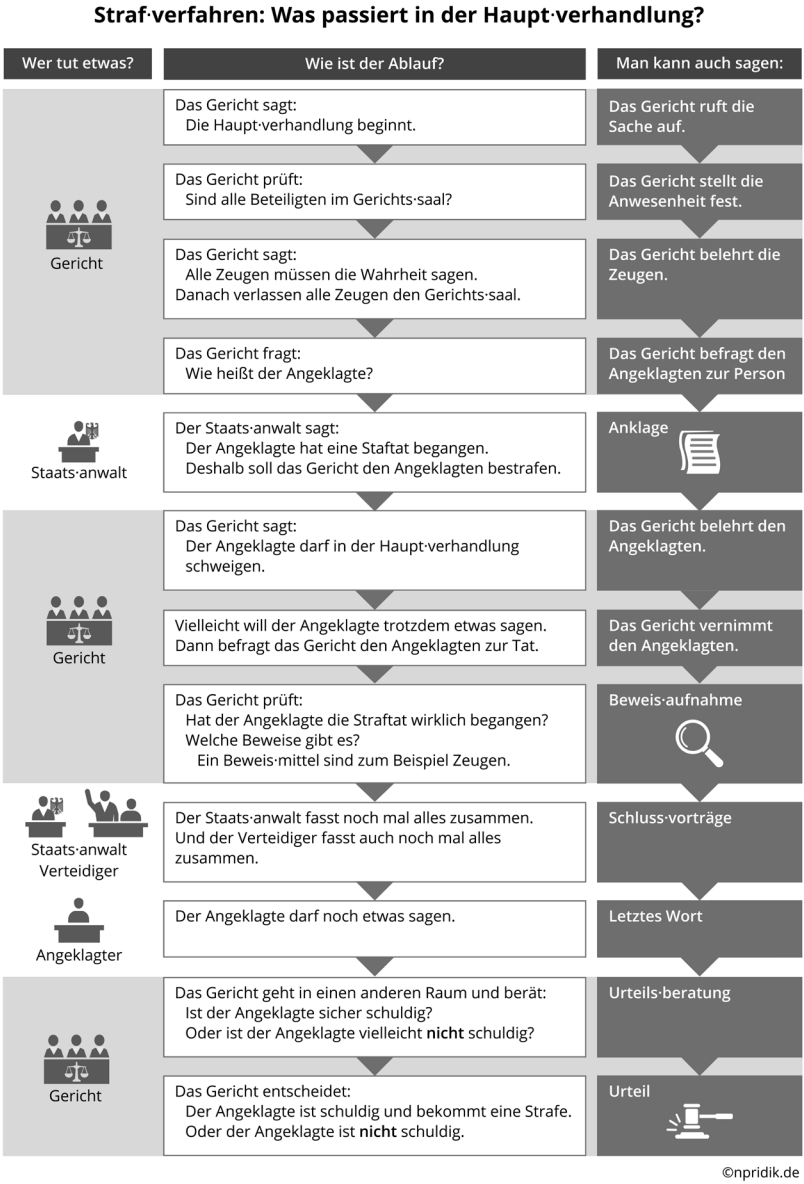


Figure 3: German concept map of main hearing
(version in colour: www.npridik.de/visualisierung-recht-leichte-sprache)

3 What makes legal concept maps comprehensible?

It has not yet been investigated which requirements legal concept maps have to fulfil in order to be comprehensible for as many people as possible – including those with cognitive impairments or limited reading skills. The following explanations try to give a first answer. However, they require further theorisation and empirical examination.

3.1 Expressive headline

A headline should express precisely what the concept map is about with as few words as possible. In this way, the viewer can better classify and understand what is visualised, because the "heading offers […] a pre-structuring and content-related setting" (Lutz 2015: 296 on headings in legislation; English translation of the German original; on the importance of titles in legal treatises Haft 2009: 142 and 143 f.).

3.2 Comprehensible text

As mentioned at the beginning, verbal language is the most important tool for communicating law. Hence, legal concept maps always include text. It is equally clear that the text in a map must always be kept as short and concise as possible and be comprehensible in itself, because the concept map is primarily a means of visualisation. In the context of Easy Language, comprehensibility implies that the rules of Easy Language are observed. (The articles by Bredel/Maaß and Maaß in this volume discuss these rules.) It is therefore a challenge to manage with only little text, because the explanation of terms is just as important in concept maps as it is for Easy Language texts. Furthermore, the omission of third person pronouns leads to increased text volume. The resulting space problems can only be resolved by making concessions to the layout rules (font size 14 pt., each sentence on a new line, larger line spacing). If all requirements were met, concept maps in the context of Easy Language would only be conceivable as posters. The examples in this article just fit onto an A4 sheet of paper using a size of 10–11 pt. in the Open Sans font, which is recommended by Alexander (2017 and in this volume) as a free alternative to the Neue Frutiger 1450 font, which has been optimised for Easy Language and is subject to charge.

3.3 Focusing on the essential

Given the space constraints, it is even more important that Easy Language charts, in comparison to other legal concept maps, are limited to only the essential content. In doing so, reducing complexity usually also means that less important content is omitted and a simplification of content takes place (Lehner 2012: 125). This is what the process of visualisation has in common with the process of translating texts into Easy Language (cf. Bredel/Maaß 2016b: 173).

3.4 Clear structure

The visualisation should show, for example, the processes involved in a legal procedure, the hierarchical relationship between certain concepts, what impact the occurrence of certain conditions has or what the difference between two concepts is. In contrast, the map should not convey that all elements are somehow related to all other elements and influence each other. This is also a finding, but there is no need for a concept map to convey it. Legal concept maps therefore only help to better understand legal content if they focus on a defined structure, which they make clearly apparent.

In the context of Easy Language, the structure will always be a relatively simple one. There are two main reasons for this:

1. Legal information is always difficult to understand for legal laypersons with cognitive impairments or limited reading skills due to its high degree of abstraction and difficult concepts. It is therefore all the more important to reduce the complexity as much as possible in order not to overwhelm the recipients.
2. Concept maps should always fit onto one page. As we have seen, Easy Language concept maps take up a lot of space simply due to the pronounced explanatory structure of the text. Therefore, there is no space for more than one simple structure.

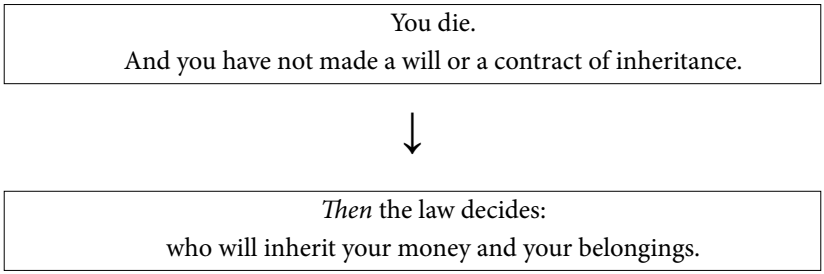
3.5 Readability of conceptual contexts

The structure does not only have to be clear in terms of content, but the observer has to be able to translate the spatial arrangement of individual elements of

the concept maps and their connection to conceptual contexts (cf. Ballstaedt 2012: 51). What is the meaning of arrows in particular? Do they only indicate the reading direction and show that a new thought follows? Do they illustrate a causal relation (Cause → Effect)? Do they indicate a conditional connection (Condition → Consequence) or a temporal sequence? The concept map should help the reader to clarify these questions.

Ballstaedt (ibid.: 115) recommends distinguishing arrows with different functions by shape and/or colour and explaining their meaning in a key (similarly Bergmans 2009: 38 f.). Stary/Unger (n.d.: 13 f.) go one step further and define not only different arrows, but also shapes and lines with their respective logical meaning and verbal statement in the key. All this undoubtedly creates clarity. However, it also makes it more difficult for the reader because his/her gaze has to move between the concept map and key several times. For this reason, footnotes are not permitted in Easy Language texts, and terms are explained immediately in the text (Bredel/Maaß 2016a: 483). The use of a key is therefore not an option for concept maps in the context of Easy Language.

Preference should be given to interpretation aids in concept maps themselves: either they are self-explanatory or their meaning can be drawn from the context. If it makes sense in terms of content and there is sufficient space, arrows can be legibly and concisely labelled. (On legible labelling of charts Ballstaedt 2012: 59.) A common example is the labelling of decision trees with *yes* or *no*. As an alternative, it is possible to additionally include the type of connection in the text. In the following example, the *Then* in the second box, which is superfluous in itself, verbalises the conditional relationship that the arrow stands for, thus clarifying its meaning:



However, an interpretation of the content is still necessary, because *Then* can also indicate a temporal sequence. But the same interpretation is required if sentences are interlinked as a running text without an arrow. The text boxes connected by the arrow only draw more attention to the fact that the sentences are directly related to each other at all. In other words: Structuring the content with the help of boxes and arrows does not replace the links on a verbal level but makes them additionally visible and draws the readers' attention to the structure.

3.6 Recognisable reading direction

One advantage of concept maps is that they are not bound to a linear sequence when conveying information. However, this non-linearity can easily lead to confusion and disorientation for the recipient. This can start with the fact that the chart does not have a clear starting point (cf. ibid.: 136 for infographics).

Easy Language concept maps will be intuitively read from top to bottom and from left to right by the literate recipient (at least if he/she comes from a culture where reading and writing is from left to right) due to the extensive text and simple structure. In addition, the concept map should have a "visual path with visual guard rails" (cf. ibid.; English translation of the German original) that guides the sequence of the evaluation. Arrows or a numbering of parts of the concept map in particular can thus indicate the direction of reading. Orientation is otherwise improved above all by the arrangement of the elements and their colouring.

As explained above, the structures of concept maps in the context of Easy Language are kept very simple. Problems in recognising the reading direction will therefore probably only occur in two constellations:

- The first concerns the case where recognition of the reading direction coincides with recognition of a conceptual context. For example, in the concept map of the inheritance succession (p. 493), the viewer must have understood the reference with the two possibilities in the first box in order to be able to classify the interpretation of the two arrows below. Similarly, in decision diagrams, the direction of reading depends on whether the reader answers *yes* or *no* to the questions.

- In the second case, the problems arise from the fact that two different reading directions are possible (and intended). An example is the concept map of the main hearing (cf. p. 494). Here, the process of the legal proceedings determines top to bottom as the main reading direction. At the same time, however, the individual stages of the procedure are supplemented in the right-hand column by the technical term or a formulation that approximates it. The function of this column is to summarise the relatively text-heavy boxes in the middle column with shorter terms, as far as possible, and at the same time to enable the acquisition of expert knowledge (on the development of legal knowledge through concept maps, see Stary/Unger n.d.). (The right and middle columns could also be arranged in reverse. However, this would not change the problem of the reading direction). The reader can ignore this column if it is too difficult to read, but the column can also be read as a supplement to the middle column. The prerequisite is that the reader understands, with the help of the context – in particular the column heading 'Man kann auch sagen' ("You can also say") – how the information is to be included while reading the concept map.

3.7 Clear design

In view of the numerous boxes and arrows, concept maps can easily appear unstructured and cluttered. This can discourage viewers from taking a closer look at them and hinders the communication of the content. The visual organisation of the elements and the design as such should therefore also be carefully considered. The aim of the concept map is to organise the content in such a way that the impression of order and clarity is created at first glance and the presentation as a whole is visually appealing. To achieve this, the elements of the concept map must be spread over the page in a balanced way, taking into account content and structure, and arranged in such a way that the design intention becomes clear (on balance and unambiguity as a microstructure of a pictorial design see Alexander 2013: 54 and 55). At the same time, sufficient white space must be ensured (on the importance of white space see Koschembar 2009: 176 ff.). Finally, few colours but those that harmonise with each other

should be used and the laws of design should be observed (Alexander 2013: 25 ff., Turtschi 2010: 20 ff.).

The Gestalt laws (ibid.) describe the laws according to which certain design elements are perceived by people (Alexander 2013: 25 and in this volume). For legal concept maps, the following four laws are of particular importance:

- According to the **law of similarity**, elements that look similar are perceived as belonging together. For this reason, text boxes and shapes that have the same function in a concept map should look the same.
- According to the **law of proximity**, elements that are close to each other are perceived as a unit. Text-image combinations within the concept map therefore belong spatially close together.
- According to the **law of simplicity**, our perception tends to prefer simple shapes. Therefore, concept maps should be equipped with simple images and should not be overloaded with information and design elements.
- Finally, the **law of common area** means that elements in delimited areas are perceived as belonging together. With the help of this law, related information can and should be grouped in a concept map, e.g. by shaded areas.

Observing Gestalt laws not only means that they should be used specifically when creating the concept map, but also that the "visual organisation […] must not be disturbed by unintended effects of Gestalt laws" (Ballstaedt 2012: 58; English translation of the German original). What does not belong together in terms of content should therefore be arranged at a distance from each other and text boxes with different functions should not look the same.

Gestalt laws are "innate 'programmes' for the spontaneous processing of visual data" (ibid.: 25; English translation of the German original). They are therefore triggered automatically in humans and do not have to be learned. However, it is not yet known whether this also applies in full to the target groups of Easy Language, who may have limited perceptual possibilities.

3.8 Images as part of text-image-combinations

In addition to the text, legal concept maps often use pictograms/icons to convey the content. These are usually intended to illustrate the verbally formulated content. However, they can also have a structuring function, such as in the first column of the diagram on the main hearing (p. 494). Another advantage of such visual elements is that they visually loosen up text-heavy concept maps, make them more appealing and subsequently motivate the viewer to deal with them. In contrast to Easy Language texts, Easy Language concept maps also manage with very few images without giving the impression that there is a lack of images.

Regardless of the function in which images are used in the concept map, they usually do not stand alone, but are part of a text-image combination within the concept map (in this respect there is a parallel to explanatory graphics and infographics, cf. Ballstaedt 2012: 132 and 134 ff.). This is important because pictograms/icons as images can be ambiguous, which initially makes it difficult to understand them in the context of the concept map. Text can change this by ascribing a clear meaning to the image. Ballstaedt (ibid.: 142), for example, points out that text can help to evaluate and interpret the image in a certain way. Since the image at the same time illustrates the text, text and image thus need each other (see also Ballstaedt 2016: 7). Together they support the comprehension and remembering of the content.

Problems arise, however, when the content is so abstract and technical that only images with a metaphorical or symbolic meaning can be used to illustrate it. For example, in the concept map on the main trial (p. 494), the viewer must recognise the federal eagle as a symbol for the state in the pictogram "public prosecutor" in order to associate the picture as a whole with the term "public prosecutor" below it. It is even more difficult to understand the visualisation of technical terms or more complex concepts, such as the pictograms in the concept map on succession (p. 493). Unfortunately, there are no findings so far on whether and to what extent such text-image combinations are accessible to the target groups of Easy Language, or whether the images in these combinations can actually help to convey the content in a comprehensible way.

Text and image should be spatially close together so that integrative processing (Ballstaedt 2012: 137) is possible. The question remains how text and

image should be arranged in relation to each other in this unit. First of all, it is better to arrange them next to each other than one below the other, as the horizontal movement is less strenuous for the eyes (Alexander 2013: 88). In concept maps, however, this cannot always be realised for reasons of space and design. For example, in the concept map on power of attorney, legal guardianship and Lasting Power of Attorney (LPA), it would not be possible to arrange the top three images next to the text (cf. p. 492). However, as it always concerns only individual text-image combinations, it is nevertheless unlikely that the arrangement will lead to eye fatigue for the viewer.

Incidentally, the following also applies: When text and images are arranged horizontally, the leading medium should be placed on the left and when they are arranged vertically, it should be placed at the top (Alexander 2013: 87 f.). The reason is that the leading medium contains more information and should therefore catch the eye first (ibid.: 87). The leading medium in legal concept maps is always the text. Therefore, the text should be placed above or to the left of the image. Here too, however, it may be that space or design reasons require or suggest a different arrangement in a specific case, such as in the concept map on succession (p. 493).

4 Conclusion

Even if various questions are still unanswered, there is much to suggest that legal concept maps can also be a suitable medium for conveying legal information in an Easy Language context. Their advantage over the medium of text is that they make structures visible that are essential for understanding the content. At the same time, they offer an alternative to the usual illustration of Easy Language texts, which quickly reaches its limits in legal contexts. There is, of course, no empirical proof of the benefits of concept maps yet.

The visualisations remain close to a textual representation due to the always simple structure and extensive text components, but the structure is additionally emphasised by the use of boxes, arrows and colours. The concept maps thus tie in directly with the strategies recommended by Bredel/Maaß (2016a: 502 ff.) for creating text coherence in Easy Language texts through typographic

design. They recommend using subheadings and marginalia, indentations, lists and supplementary images (ibid.). In the case of concept maps, nothing different happens as a result, only the structuring means are partly different and occasionally the linearity of the text is broken by a deviating text arrangement.

On the positive side, legal concept maps are always limited to one page. The reader does not have to follow the topic's development over several pages but has one manageable unit. This unit of meaning is self-contained and, if possible, self-explanatory, even if it is far from a comprehensive presentation of the content. Moreover, since it is only a small section of a larger complex context, it must in any case be embedded in a textual context or explained orally. In the end, it will be precisely this word-image combination that helps the addressees to understand the content.

In conclusion, it has to be noted that legal contents themselves will always be abstract and complex, even if they are presented in a comprehensible way. This applies to legal texts in Easy Language as well as to legal concept maps. Both will therefore certainly not reach every user. If readers are able to understand a legal text in Easy Language, they will likely also benefit from supplementary concept maps. In addition, concept maps may provide access to the content for people who are more likely to be attracted to a clear visual presentation than to a longer continuous text. In any case, it is interesting for those who explain the content to the primary target groups of Easy Language because explaining is easier when you can refer to a visualisation in the process.

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Jan Hellbusch

Creating a better user experience through accessible web design

1 Introduction

To ensure that digital content is accessible, several aspects have to be taken into account during its development. The requirements for accessibility are very diverse and depend on the concrete group of users with disabilities, the different types of content and the format. To blind users, for example, accessibility means something completely different than to users with visual impairments or with a learning disability. The approach a content provider has to choose for a scientific article is different from that for interactive or multimedia content. Similarly, different tools have to be applied depending on whether HTML, a document format or another user interface is utilised to make the content accessible.

In this article, several central requirements concerning accessibility of web-based content will be introduced. The requirements for accessible web-based content can be found in the Web Content Accessibility Guidelines (WCAG) 2.0. "Accessibility" is mostly understood as conformance to these directives. Fulfilment of the specifications is considered a minimum requirement for achieving a positive user experience (UX) for people with disabilities.

Accessible web content is not easy to create. Not only developers, graphic designers or editors have to take the requirements into consideration. It is the joint task of everybody involved in a web project to take responsibility for ensuring accessibility during the development processes. Special attention should be paid to the following points:

1. Digital content can only be consumed or utilised by everyone if the minimum requirements for accessibility are fulfilled.

2. Only accessible content allows for an evaluation of aspects such as efficiency or user satisfaction and, as a result, the UX. Even if the digital content itself conforms to the directives, users may encounter "barriers" that can have a number of causes, ranging from incompatibilities between e.g. tools and the browser to usability problems in the context of a disability.
3. To exclude as few users (with disabilities) as possible, digital content has to be planned consistently and as part of an inclusive development process. Regular evaluations are necessary as well.

2 Directives

Accessibility of web content is synonymous with conformance to WCAG 2.0 (W3C 2008). WCAG 2.0 was already published in 2008 by the World Wide Web Consortium (W3C), but to this day remains the fundamental catalogue of criteria for accessible web design in numerous countries all over the world.

WCAG 2.0 is a complex system of documents with normative and non-normative (informative) content. It encompasses four principles, subdivided into twelve individual directives, and lists 61 criteria for success. The fulfilment of these success criteria is decisive for the evaluation of accessibility. They are distributed over three conformance levels (conformance levels A, AA and AAA), with the success criteria on level A being the most important. All success criteria are formulated as testable instructions and, to confirm the accessibility of a website, either all criteria on level A or all criteria on level A and AA (conformance level AA) or all criteria from WCAG 2.0 (conformance level AAA) have to be fulfilled (W3C 2016a). Achieving conformance level AA is a realistic objective for every web project. The fulfilment of every success criterion is not always possible in practice, though.

In Germany, the Ordinance on Barrier-Free Information Technology (BITV 2.0) has been in place since 2011. It is binding only for public agencies of the federal government. Appendix 1 of BITV 2.0 includes an excerpt from WCAG 2.0. Even though Appendix 1 of BITV 2.0 is not identical with WCAG 2.0, it can largely be read like WCAG 2.0. An important aspect is determined

in § 3 Par. 1 of BITV 2.0, according to which all digital content has to meet the criteria for conformance level AA ("Requirements of Priority I"). Similar regulations can be found in Germany at the federal level as well as in Switzerland, Austria and many other European countries.

The most extensive documentation concerning accessibility, especially regarding web technologies, is offered by the W3C itself. WCAG 2.0 is complemented by numerous informative documents. Above all, the explanatory documents and best-practice-techniques regarding different success criteria have to be mentioned (W3C 2016b), but there are also so-called "notes", describing individual topics or further requirements, which for a variety of reasons were not included in the web standards. Among these are, for example, requirements that go beyond WCAG 2.0, such as requirements for visually impaired users, or formalised frameworks regarding the cross-page evaluation of a web offer.

WCAG 2.1 was published in June 2018 (W3C 2018). WCAG 2.1 closes several of the gaps in WCAG 2.0 in terms of questions of accessibility especially for the visually impaired, people with learning disabilities and mobile device users with disabilities. WCAG 2.1 can be considered a first step towards WCAG 3.0, extending the requirements of accessibility to documents and other environments (e.g. payment systems or navigation devices) (Hellbusch 2018). This large-scale update of web standards for accessibility is planned for late 2020. Until WCAG 3.0 is published, it will be permissible to use WCAG 2.0 and WCAG 2.1 in parallel.

Initially, WCAG 2.1 will not be compulsory in Germany or the rest of Europe. The European Commission determined the minimum requirements for the accessibility of websites in October 2016 as Directive 2102 (see the article by Lang in this volume). EN 301 549, based on WCAG 2.0, has been designated as the technical standard. The European Directive currently determines via EN 301 549 that conformance level AA of WCAG 2.0 is the minimum level of accessibility of digital content to be applied by the public authorities in the member states, and thus also in Germany.

The private sector is currently obligated to apply accessible web design in only a very few cases. However, there is a draft version of another European directive that is currently being discussed, the so-called European Accessibil-

ity Act (EAA), which will regulate the accessibility of products and services. The EAA also designates WCAG 2.0 as the technical standard, but its scope currently "only" includes certain companies of public interest.

Even though WCAG 2.0 was developed specifically for web-based content, it can also be applied to other types of digital content, e.g. software or documents. But there are several limitations. For example, the success criteria in WCAG 2.0 are applicable to (native) apps for mobile devices, but certain special features, such as touch operation, are not covered by the requirements. The displays of hardware devices in the "Internet of Things" or special features of certain documents and document formats are not sufficiently covered by WCAG 2.0 either.

3 Users

WCAG 2.0 – conformance level AA – may be the standard for the accessibility of web content on a formal level, but user demands will go beyond it in many concrete cases. This is not only the case due to the individual requirements in WCAG 2.0, some of which are of a minimalistic character, but naturally also due to the software used or requirements of the users themselves. For these reasons, conformance to WCAG 2.0 may be seen as a mere point of departure on the path to a website that can be easily used by as many people as possible.

An example of a minimum requirement in WCAG 2.0 is keyboard operation. There are a few criteria that have to be fulfilled according to WCAG 2.0 for accessible use of a keyboard on a website, but it is sufficient for the actual navigation of the site that every function and link therein may theoretically be reached and activated via a keyboard. As a result, dynamic navigation at the start of the page may not be accessible via a keyboard, but if there is another navigation option at the bottom of the page with the same links that is accessible via a keyboard, conformance can be achieved in spite of the navigation option at the top. For smaller websites, this approach to conformance is not necessarily limiting, but on larger websites in particular, navigation that is only partially accessible via keyboard could be time-consuming for keyboard users. Here, dynamic types of content such as menus, tabbed navigations or

sortable tables can be made easy to use for keyboard users, provided there is adequate focus management. The topic of keyboard usage on websites can make the difference between accessibility (conformance to WCAG 2.0) and a positive UX very clear.

The fact that simple conformance to WCAG 2.0 is sometimes not sufficient is also illustrated by the use of concrete aids by people with disabilities. There is a range of input devices that can replace a mouse or keyboard, as well as software, such as on-screen keyboards or voice recognition, all of which are based on pre-existing user interfaces in the operating system. For output, there are screen readers that convert content into language or Braille, as well as screen magnification systems (Hellbusch/Probiesch 2011: 11 ff.). Not all aids sufficiently support web standards and not every user has access to the most up-to-date software. Thus, it is entirely possible that modern websites that conform to all standards are used with a five-year-old screen reader and that compatibility problems then lead to the website or a single component of the website being only partially usable, or not at all. Therefore, it is necessary that the usability of websites in different browsers and with different aids is checked and that, where necessary, alternative implementation techniques for certain types of content are employed, even though conformance may already have been certified.

There are further issues that are underrepresented in WCAG 2.0, among them comprehensibility and consideration of certain formatting techniques for better readability. They are, if at all, included in conformance level AAA. Aside from a few requirements regarding abbreviations, pronunciation and unusual words, the requirements for comprehensibility contain only one success criterion that focuses on reading levels:

> 3.1.5 Reading level: When text requires a reading ability more advanced than the lower secondary education level after removal of proper names and titles, supplemental content, or a version that does not require reading ability more advanced than the lower secondary education level, is available. (WCAG 2.0, level AAA)

In terms of readability, requirements for the visual presentation can only be found in conformance level AAA and refer to colour, line length, line alignment, line spacing and text enlargement. Aspects such as font and emphasis as well as other aspects of design, e.g. background, are not part of the requirements, mostly because they cannot be universally defined. Certain users, for example, will be able to read more easily with a sans serif font such as Helvetica, while others prefer a font with serifs. However: The requirements for visual presentation do not regulate the design of a website, they simply determine that every user should have the option to make adjustments.

The WCAG 2.0 do not represent every demand made by people with disabilities regarding accessibility. There are different reasons for this. An important one is testability: Requirements that can be tested objectively can be found in conformance levels A or AA (depending on the consequences of non-fulfilment), while success criteria which are measurable only to a certain extent or might influence the design of the content too strongly can instead be found in level AAA or are not included in the directive at all (W3C 2016a). These compromises are important insofar as they illustrate the aim of objectifying accessibility and promoting the acceptance of the requirements.

It is obvious that the requirements for accessibility may be insufficient in an individual context. To ensure a positive user experience for as many people with disabilities as possible, the requirements of individual user groups and users have to be implemented into design considerations for digital content. Here, the modes of operation and specific demands of different user groups may not be included in the desired conformance level of WCAG 2.0. Furthermore, in many cases there are no overlaps between individual needs, which is also the reason why this topic is very demanding in terms of resources, especially in the beginning. Thus, each possible requirement and overlap in terms of directives should be considered separately before implementation of an accessible web design:

- The visually impaired are a heterogeneous user group. Particularly important aspects in web development are the adjustment of screen settings and consideration of sufficient contrast relations in texts.

Visually impaired users will benefit more strongly from conformance to WCAG 2.1 than from conformance to WCAG 2.0.

- Blind users utilise screen readers to convey screen content with the help of non-visual output devices (acoustically with voice output or haptically via a so-called Braille display). Screen readers, by contrast, rely on the accessibility-tree of an operating system. Users of screen readers already benefit strongly from conformity to WCAG 2.0.
- Some users with physical disabilities cannot use a keyboard (or the mouse pointer). It is important for the web design that the usability of every function is ensured not only with a mouse pointer, but also with a keyboard. Especially for mobile devices, WCAG 2.1 offers several further requirements compared to WCAG 2.0 with regard to accessible usage for people with physical disabilities.
- Individuals with learning disabilities require, among other things, Easy Language. Corresponding requirements are only sparingly included in the accessibility web standards. WCAG 2.1 contains several requirements for distraction-free interaction e.g. in the case of authentication. BITV 2.0 further determines that the landing page of a web offer has to contain introductory information in Easy Language.
- For deaf users, acoustic information has to be conveyed separately in text form. The translation of content into sign language is recommended only for audio content in videos according to WCAG 2.0. BITV 2.0, on the other hand, determines that the landing page of a web offer has to contain a Sign Language video with an introduction to content and navigation options.
- This overview is not exhaustive. The user groups can be extended (e.g. some forms of disability or chronic illnesses such as epilepsy are not included at all in the list) and can also be further differentiated. The overview merely presents the starting point for the development of accessible web offers from the users' point of view. Conformance to WCAG 2.0 enables access to content for many users with disabilities, but in order to create a positive user experience for as many users as

possible, requirements based on disability as well as, in certain cases, individual needs, need to be weighted more strongly.

4 Selected topics

Accessibility concerns everybody involved in the development and publication of digital content. There are different focuses, however, that designers, developers or editors have to take responsibility for in concrete situations. At the same time, the tasks often cannot be clearly differentiated from each other, and tasks overlap with other work processes within an organisation.

A smaller aspect of accessibility is, for example, the page title of a website. Naturally, at the end of any publishing process, an editor has to input and check the text in an editorial system. But before that can happen, a developer has to enable input of an individual page title for this specific purpose. Meanwhile, the marketing department or an expert for search engine optimisation could have certain directives for formulations of page titles, as the page title influences the retrievability of websites in search engines. Such aspects, as well as the ever-present temporal and budgetary requirements, have to be continuously synchronised with the requirements of accessibility.

There are several requirements that are important for certain user groups and at least advisable for the credibility of an information provider who advocates for accessibility. These are not necessarily the most important questions for every user, as what is important mostly depends on individual users and user groups, but they are essential aspects of accessibility based on WCAG 2.0.

How the individual topics can best be implemented has to be identified in the extensive documentations of the W3C (W3C 2016b) or elsewhere on the Internet, as there are simply too many scenarios, meaning that there is no "best" or universal solution. Conformance can very well be achieved by various means in differing situations.

4.1 Text alternatives

Text alternatives play an important role, especially for graphics and how they are perceived by the users of screen readers. Here, the choice of the adequate

text alternative is anything but trivial (Kitza 2015). On the one hand, there is the question of how exactly a graphic has to be described, and on the other hand, there are various techniques for the implementation of a text alternative.

First of all, WCAG 2.0 determines that graphics require a text alternative which fulfils a function equivalent to that of the graphic. Thus, the function of the graphic is what belongs into the text alternative. There are three different fundamental functions:

- The graphic is part of an active element (e.g. a link or button). In this case, the graphic is secondary. The graphic (including the text alternative) and the text that is otherwise connected to the active element have to explain the underlying function.
- The graphic represents content that is not present in textual form anywhere on the page. Here, WCAG 2.0 differentiates between identifying and descriptive text alternatives. Identifying text alternatives can be used for graphics that are mostly described in context, but also for e.g. works of art. Descriptive text alternatives by contrast are necessary in particular when essential content is presented in the graphic, which would lead to incomplete information on the site without the graphic (TU Chemnitz 2016).
- The graphic is used as decoration. If the absence of the graphic does not lead to a lack of information, the graphic has to be ignorable, especially by screen readers.

In this case, we are referring to a "text alternative", not to an "alternative text". In fact, WCAG 2.0 requires text alternatives, with alternative text (alt attribute of a graphic) being "only" one possible technique. In addition to a picture caption (with the HTML elements <figure> and <figcaption>), there are further techniques with Accessible Rich Internet Applications (ARIA) to determine a text alternative. In practice, the alternative text has to almost always be used as a text alternative (see also Schütt's article in this volume).

4.2 Instructions and labels for forms

Concerning accessibility, one often has to differentiate between accessibility in the actual sense and usability in general. If, for example, validation is not implemented in a form and everybody can send an incorrectly completed form, then everybody will face the same problem. If input errors are marked by colour, but not as text, certain user groups with disabilities will be faced with a barrier.

WCAG 2.0 determines a number of criteria for interaction with forms and other components. Avoiding errors is the most important aspect. Even though every user makes mistakes during input, some people with disabilities have more difficulties related to error-free input or noticing errors in their input. For that reason, users have to be supported during input in forms to avoid errors. Should there be errors, then users should be supported in recognising and correcting them. The following concrete aspects and strategies exist:

- Error messages have to be textual (a coloured mark-up does not suffice).
- If the validation of a form takes place while sending it, algorithms are applied and, in most cases, users are then prompted to correct the input errors. The reason for non-validation has to be presented as precisely as possible. This should be deducible from the algorithms. For example, mandatory fields that are left empty should be highlighted, or in the case of a wrong telephone number, one should use "letters are not valid in telephone numbers" instead of "invalid telephone number".
- If sending a form has legal or financial consequences, the user must be able to confirm the sending of the form at least once, or be able to reverse the process after sending. This ensures that a commitment is not made by accident. The same applies if users attempt to delete an account or other important data.

Apart from that, there are other technological requirements for forms, from which users of screen readers profit in particular. Generally speaking, native HTML elements such as <input> or <select> are to be preferred for form elements, as browsers by default offer the use of a keyboard with form elements,

and the technological identification with regards to role and value is also reliably transmitted by the browser to the operating system's accessibility tree. If meaningless elements are used and designed for form elements, it will be difficult to achieve conformance to WCAG 2.0.

Furthermore, the visible labelling of a form field, if available, has to be explicitly linked to the control element with a <label> element. If there is no textual labelling (e.g. in a tool bar), the control elements have to be designated in different ways, e.g. with ARIA attributes, as without any designation, users of screen readers will be unable to determine the purpose of the active elements.

4.3 Structure and semantics

Structures in a website, a document or software are the technological basis for accessibility. Structures in the content, which are visible on the screen, have to be comprehensible without a presentation layer (online: without CSS).

The structuring of content in HTML is primarily achieved through:

- Paragraphs
- Headings (with six total layers)
- Lists (<ul>, <ol> and <dl>)
- Data tables (with the distinction between head cells and data cells)

All content should be placed in one of the elements. Technologically, the correct implementation of those HTML elements is the tool that every editorial system and every editor has to be proficient in. Not every type of content can be displayed with the four types of elements, though. With HTML5, further elements relevant to accessibility were introduced, such as:

- <figure> (with <figcaption>) for referenceable content (e.g. pictures with captions, but also other content such as code examples or multimedia)
- <main> for the main content of a website
- Structuring elements to semantically identify the regions of a website, e.g. with <nav>, <header>, <footer> and <aside>.

- Less important, but also connected to semantics for screen readers, are the structuring elements <section> and <article>.

Semantics are not only important for capturing the structure of the specific content. As it is not readily possible to "scan" extensive content with a screen reader, these devices offer a so-called structural navigation. As a result, it is possible to e.g. jump between different headings with a specific key (in most cases, the "H" key). With other keys, it is possible to navigate to regions, tables, form elements or graphics. The better the semantic elements in a type of content are synchronised, the easier it becomes to navigate them with a screen reader.

4.4 Keyboard operation

Keyboard operation was already introduced as a minimum requirement earlier in this text. Motor-impaired or blind people, among others, have to rely on the possibility of keyboard operation. In terms of conformance in the area of keyboard operation, the operation with the Tab key is central, which, in an online environment, is a functionality of the browser, not the screen reader. Keyboard operation is essential for certain users and the concrete demands are quite manageable:

1. Most importantly, every function and link on a website has to be usable with a keyboard. For links and form elements, the browser offers this functionality if the HTML complies to the standards. For advanced (dynamic) components such as tab navigation, sortable tables or filtering functions for selection lists, HTML does not offer any adequate elements. Most importantly in terms of keyboard operation is a focus management with event handlers by the author. The requirements for focus management are described in an informative document complementing the ARIA specifications (W3C 2017) and are supplemented with functional examples.
2. Furthermore, the focus may not be manipulated. If a user navigates a website with the Tab key, contextual help and similar supplementary texts may be added to the site, but new content may only be shown after its activation (normally with the Enter key or the Space key).

Even more importantly, the focus must never be changed through JavaScript, which means that if a user is navigating the site with the Tab key, it has to be possible to navigate from the top of the site to the bottom and back.

3. Focus manipulation also has to be avoided in the navigation of control elements (input or selection). A common example is a selection list that can easily be extended with a mouse and, after one entry has been selected with a click, automatically forwards the user to a different site. With this mode of selection, keyboard users will have tremendous difficulties in making a selection in longer selection lists as the automatic forwarding is activated by the marking jumping up or down. With adequate event handlers for the pressing of a key, such barriers can be removed.
4. Furthermore, the order of focuses has to be coherent, i.e. the active elements in certain sections of a website are included one after another and generally from left to right and from top to bottom into the focus order of the browser. This is also the case when content is added in a dynamic fashion. Here, it is obvious that the focus should always be visible.

4.5 Colours and contrast

People who cannot see colours (due to altered screen settings or defective vision or because a screen reader is being used) cannot detect information conveyed by colours in the fore- or background. Colours may and should be used for highlighting but there have to be additional distinctive properties to ensure accessibility. There are two scenarios to consider:

- For visually impaired users, at least one additional visual highlighting (e.g. boldfacing, prepended symbols, frames, etc.) is necessary to ensure reliable identification of colour highlighted content.
- For users of screen readers, visual formatting is of no importance. Screen readers need structural or textual highlighting. For example, a highlighted entry in the navigation (indicating the current page)

should be linked to an adequate ARIA attribute (e.g. aria-current= "true"), which marks the current page.

WCAG 2.0 determines some further requirements for visual perception. Special attention should be paid to contrast requirements. The W3C determines requirements for brightness contrasts and offers a formula for the contrast ratio of two colour values (Paciello Group n.d.). To measure this contrast ratio, there are numerous tools to be found online and free of charge, e.g. the Color Contrast Analyzer.

In the algorithms of the W3C, colour differences that can be relevant in the context of colour blindness are not considered. If, for example, a user suffers from red blindness, the perception of red may be the same as the perception of black or dark grey, so that a medium-level shade of red on black may represent a sufficient contrast level following the algorithms of the W3C while some users may still be unable to read the text. For colour design, it is thus advisable to also employ simulators for colour perception.

Contrast ratios have to be measured in several places. Aside from continuous texts, headings, tables or labels, contrast ratios also have to be tested with e.g. the following texts:

- Error alerts in forms often have too low a contrast ratio.
- Mouseover and focus often lower contrasts instead of increasing them.
- If the background of a text is multicoloured, the lowest contrast ratio is what matters.
- Especially in the case of texts in graphics with a transparent background, different sections with different backgrounds often have to be tested.

4.6 Multimedia

Multimedia offers many possibilities of providing information. The following measures are necessary for the combination of audio and video in order to offer accessible acoustic and visual information:

- According to the rules of WCAG 2.0, subtitles must be used to provide acoustic information for multimedia offers. Spoken content can be changed to text automatically but editing and correcting the texts afterwards is almost always necessary. In addition to spoken content, it must be checked whether more acoustic contents provide relevant information that has to be considered in the subtitles (on subtitling for the hearing impaired see also Mälzer/Wünsche in this volume).
- Audio descriptions must be used to provide visual information in multimedia. Audio descriptions are audio clips with descriptions of the only visual parts of a video stream (e.g. displayed text, gestures, facial expressions, actions or landscapes) that are synchronised with multimedia and where multimedia can be optionally added. Reliable automated processes to describe information that are not acoustically available, e.g. information in the form of gestures or actions, do not yet exist (the current situation is described in Kurch's article in this volume); in fact, audio description is essentially an expert task (see Benecke in this volume).

These requirements do not apply to clips that are purely audio or just video. Although contents in this form are inaccessible for deaf or blind users respectively, according to the directives, it is sufficient to provide an audio transcript (for audio) or an entire text alternative (for video).

5 Accessibility First

In most cases, accessible web design is a challenge due to the diversity of the requirements. Designers and developers do not need to be accessibility experts, though. It is important that they are aware of the relevance of WCAG 2.0 and that decision makers recognise the necessity of ensuring fulfilment of these criteria.

In practice, it is often the case that conformance to WCAG 2.0 is scheduled at the end of the process or even after the launch, and only if the budget allows for verification and improvement. This approach is not productive because if

the installed JavaScript frameworks produce a code that is inaccessible, or if a content management system does not satisfy the important requirements to achieve accessibility, the software usually cannot be upgraded. Some editorial adjustments can sometimes be made and one creative aspect or another might be revised. The technical requirements for accessibility, however, are unnecessarily overlooked in this situation. And even if basic accessibility is enabled for people with disabilities, there is still an additional step until the users can benefit from a positive user experience.

In order to even achieve conformance level AA of WCAG 2.0, the verifications must be scheduled early in the development process. If early-stage quality assurance of accessibility is implemented, an "Accessibility First" approach, websites can achieve the principles of universal design or Design for All. Accessible websites are not harder to use; quite the opposite: Measures that improve usability for people with disabilities, improve usability in general (see also Womser-Hacker in this volume). With "Accessibility First", conformance to WCAG 2.0 is not guaranteed but the result will probably be a website that is very easy to use. If, during the creative process and the development process:

- third-party software (e.g. frameworks) is checked for accessible output,
- the importance of legibility for people with disabilities is considered,
- developers receive introductory training to the technical requirements or
- prototypes are tested by users with different disabilities,

then many barriers to accessible web design can be reduced early on.

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Christa Womser-Hacker

Accessible human-computer interaction

0 Introduction

Accessibility is becoming increasingly established as an important topic in human-computer interaction (HCI). HCI is regarded as an interdisciplinary subject area involving various disciplines (work science, ergonomics, computer science, information science, medicine, psychology, etc.). In information science, the scientific perspective of which will be assumed here, the general objective is to provide equal access to information and knowledge as well as technologies and tools used for this purpose. This form of participation is not only focused on reception of knowledge, but also on the creation of own content, e.g. in social networks in the form of *user-generated content* or in the *World Wide Web*.

The sequence of elements in the compound human-machine interaction is programmatic: Information science is primarily concerned with the perspective of the human being, for whom "the machine" is supposed to be an aid in the completion of tasks. The term human-computer interaction (HCI) has become the most frequently used term in the Anglo-American language area. Computer-human interaction (CHI), on the other hand, is more system-driven and focuses on the development of new technologies.

This article initially explains what HCI encompasses. Afterwards, the particular challenges posed by accessibility are addressed. A special focus lies on the development process of interactive user interfaces as well as on methods and tools for user-oriented design and evaluation. Examples of accessible approaches as well as a conclusion complete the article.

1 Human-computer interaction: definition and context

HCI refers to interactive collaboration between man and machine within operating and communication processes via an interface, whereby the tasks are distributed between both interaction partners. Intensive discussions are currently taking place regarding the extension of autonomy transfer to machines. The machine is an automated artifact, usually a computer. Since the exact differentiation between machine, computer, system etc. is becoming more and more difficult nowadays, the concept of human-machine interaction should be retained and applied as the representative term for all automated, digital systems such as smartphones, tablets, automatons, data glasses, smart watches, apps, web applications, navigation systems etc. So-called ubiquitous systems (*ubiquitous, ambient systems*), such as those in everyday or household appliances, for example, or which take on semi-reality-extending tasks within various situations also represent a new challenge for HCI.

The decisive component here is the visible or invisible user interface or simply, the interface through which the interaction takes place. In general, users do not need to understand precisely what happens behind this interface in order to interact successfully. For example, the interface can be a traditional graphical user interface with graphical-textual elements (windows, menus, objects represented by icons, dialogue boxes, buttons, etc.) that can be selected and manipulated directly with control instruments such as the mouse or via touch screen. Direct manipulation is based on the so-called WYSIWYG principle (*"What You See Is What You Get"*), which makes changes immediately obvious (e.g. the delete function → an object is moved to the recycle bin and disappears from the desktop).

Another interaction paradigm uses natural language in written or spoken form. Especially due to current voice assistants such as Amazon Alexa, Apple Siri, Google Assistant have voice control systems achieved high popularity e.g. in the field of *smart homes*.

Control of interaction via gestures (by hand or head) or eye movements recorded by a camera is also already being used (e.g. in smartphone cameras, game consoles, car multimedia systems, keyboard operation). So-called stereo-

scopy (gesture recognition without infrared light) also works outdoors. In the case of touch-sensitive screens in smartphones or tablets, interaction through various gestures, e.g. for navigation or for zooming in or out, has become common practice.

The former command-oriented, formal language interfaces have been largely replaced in general areas and may still be found in database query languages such as SQL or MESSENGER, but even there they are mainly understood as internal interfaces that are operated by technical experts.

2 Accessible human-computer interaction

On the one hand, HCI is subject to specific directives and legal requirements for accessibility, and on the other hand, the Usability Standards in the design of the HCI are also valid in this area and should be supplemented by a positive user experience. Carstens (2015) summarises the legal framework for the specific area of accessible IT in the justice system, but this can be generalised very well with regard to all information and communication technology. The German constitution (Grundgesetz, GG), the UN Convention on the Rights of Persons with Disabilities (UN-Behindertenrechtskonvention, UN-BRK) as well as requirements in EU law require that people with disabilities are guaranteed

> "self-determined participation in all modern information and communication technologies which are provided electronically or are open for use, and to remove existing obstacles and barriers to access (par. 9, 13 und 27 UNCRPD)" (Carstens 2015: 178; English translation of the German original).

The German Act on Equal Opportunities for Persons with Disabilities (BGG) (cf. also the implementing regulations and the Equal Opportunities for Persons with Disabilities Acts of the German federal states) requires in § 12 (1) that access via user interfaces can be used by disabled persons without restriction and without outside assistance. Accessibility standards are available for the web

and for non-web-based HCI areas, which are relevant here. For web applications and website design, the Web Content Accessibility Guidelines (WCAG 2.0) as the official recommendation of the Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C) must be observed in particular. The authorised German translation, available since October 2009, comprises a normative and a non-normative part. Lang's contribution in this volume deals with the legal situation, including the regulatory texts and best practice of the type WCAG 2.0. The WCAG version 2.1 (also WCAG 2018) is now available, which is discussed in Schütt's contribution in this volume. The specific guidelines and success criteria are dealt with in section 3.2 on evaluation.

It shows that there is a large overlap between accessibility and usability in the legal framework.

As explained above, the user is always at the forefront of the information science perspective of HCI. DIN EN ISO standard 9241-110 (2008) provides the following definition for usability:

> "Usability is the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use."

This means that a product / system is not only considered in terms of its functional properties, but always in terms of its interaction with real users. The users are crucial, as they define the context of use and the objectives. While effectiveness (How precisely and completely can a goal be achieved?) and efficiency (What effort must be made for a certain effectiveness?) can be quantified, the satisfaction aspect is a rather subjective-qualitative value that can be measured by the fulfilment or non-fulfilment of user expectations. Usability is implemented via seven principles of dialogue design (cf. DIN EN ISO 9241-110 2008) (suitability for the user's tasks, self-descriptiveness, conformity with user expectations, suitability for learning, controllability, error tolerance, suitability for individualisation).

Usability is increasingly being replaced by so-called User Experience (UX). This term is broader and refers not only to immediate use, but also to the before and after. It focuses on the overall experience that the user associates with the

product / system. This includes all experiences that are made with a product or a web application – including emotions, subjective aesthetic feelings, fun or joy of use.

In the area of accessible HCI, the aim is to enable users with disabilities to use the systems in the same way as people without disabilities (cf. BGG 2016). For this reason, developers of HCI interfaces must give equal consideration to all types of restrictions that impede access to and use of knowledge and information. Barriers are not always triggered by disabilities. They can also result from a lack of skills such as not understanding a language or outdated hardware infrastructures. Smartphones with small displays, which offer relatively little space for content and interaction elements, should be mentioned as examples. The context of use here can change rapidly and include, for example, bad lighting conditions, acoustic interference sources or poor network coverage, which is equally problematic for people with and without handicaps.

It is interesting to note the discussion that is taking place here on *Universal Design* (cf. Fuchs/Obrist 2010) and individual solutions. The quintessence is that the design of the systems should be geared towards use by as many people as possible, i.e. the aim should not be to compensate for a specific handicap, but to achieve as general an accessible usability as possible. With regard to the user-oriented design / programming of HCI systems, so-called user interfaces for all and user-specific solutions are weighed against each other. The first approach takes the position that an "off-the-shelf" user interface should be designed in such a simple, intuitive and natural way that it does not cause problems for the "average" user. For economic reasons, individual necessities are usually ignored. Considering our ageing society, however, certain types of disability such as hearing and visual impairments are increasingly becoming the focus of interest and, in view of the high figures, appear to be profitable again for developers and manufacturers. However, this also means that achieving 100% accessibility in the HCI is hardly possible.

There is currently no systematic categorisation of alternative HCI concepts, not least because of their high degree of complexity. In HCI research, there is a large number of exemplary approaches, most of which target a specific form of impairment.

In the following, the barriers that need to be considered in HCI are listed (on communication barriers, see the contribution by Rink in this volume):

- Sensory barriers exist when the use of one or more senses is restricted or completely lost. This can be the result of an illness / injury or innate and affects the sense of sight and hearing. Due to age-related changes in human capabilities, this affects a large number of people (cf. Weber 2015: 50 f.). The spectrum here ranges from slight visual and hearing impairments to complete blindness or complete hearing loss. Colour vision defects can also play a role in the HCI, since colours are connoted with functions (e.g. traffic light metaphor).
- Motor barriers also affect a wide range of impairments. They can include complete immobility of limbs as well as spasticity, so that, for example, navigation and accuracy on keyboards or navigation elements suffer (cf. Sünkler 2015: 222 f.).
- Mental-cognitive disabilities should not be in the foreground here. However, the HCI can also be impaired if, for example, text comprehension of offered content is not given or information processes, architectures or workflows lead to orientation or comprehension difficulties.

With conventional HCI, a prioritisation of the visual is noticeable, i.e. input is generally realised via the keyboard, output via a visual output, which, in this respect, denies people with disabilities the participation in information and knowledge. HCI research is currently focusing on these visual limitations, as Weber (2015: 57) identified.

Considering the societal goal of enabling participation in information and knowledge, user interfaces have the function of compensating for corresponding impairments. Since input is realised via the keyboard in the conventional HCI, and output via visual output, this leads to the exclusion of a large number of people.

3 Usability engineering

To achieve a satisfactory result for the user, the user-oriented design of interactive HCI systems initially follows two basic paradigms:

1. In so-called user-centred design (cf. Cato 2001, Preece et al. 2015), which undergoes various phases, the future user is given the central focus and participates in the design from the beginning. The first step therefore includes an analysis of the characteristics of the future users and the respective usage contexts. The goals, needs, preferences, wishes, intentions, but also possible impairments are anticipated in order to orient the HCI development towards them. The characteristics of the context are also identified so that these can also be incorporated into the design process. In the second step, the results of the requirements analysis lead to a requirements catalogue, which specifies the essential functions and design elements. From this in turn, multimodal operating concepts can be designed in a first prototype under consideration of *usability guidelines* or *style guides*, which is then subjected to an iterative evaluation. This is also referred to as *rapid prototyping*, which means that a partly executable prototype is developed at a very early stage, with which the later real situation can be easily understood by users.
2. Through the principle of participation, the users are involved in this evaluation. This is called formative evaluation, because the results are fed back into the iterative optimisation of the prototype and thus an improved version is developed in several cycles. At the end of each system development, there is a summative evaluation, which subjects the entire system to an assessment.

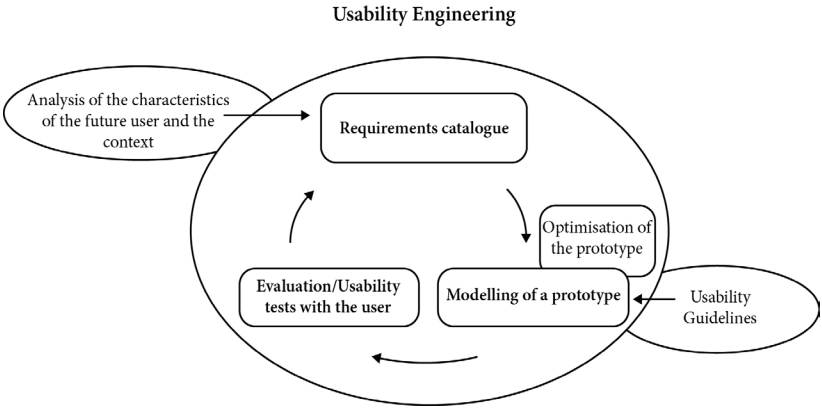

Figure 1: Usability Engineering

The inclusion of UX aspects requires a much more differentiated approach, since in addition to functional effectiveness and efficiency, subjective, hedonic, aesthetic and emotional factors come into play, which can also be subject to a certain dynamic (cf. Hassenzahl/Tractinsky 2006: 91–97). The aim here is to provide the user with the most positive experience possible.

3.1 Methods and tools

Elaborate methods and tools are available for the various design phases. In information science, the research field of so-called *Information Behaviour* has established itself, which has experienced an intensive connection with HCI, especially in the field of interactive information retrieval. The aim is to survey the information behaviour of users and the associated usage scenarios – not least with the aim of aligning the development of the systems accordingly. It is important to note that the aim is not to teach users how to use the systems correctly, but to allow them to use them as intuitively and naturally as possible.

Gathering user characteristics and contexts can be carried out through surveys, but it is a well-known phenomenon that users are not always aware of their exact behaviour and that this does not always follow a targeted strategy. In many cases the survey was therefore replaced or supplemented by observation or by so-called *shadowing* (cf. Görtz 2011), whereby the test person remains in the background. The capabilities of new technologies are often not yet present

in the imagination of the user. It is therefore particularly important to involve developers and users in the design process at all stages, e.g. in so-called *co-creation workshops* or focus groups. As soon as a first prototype (also possible as a *mock-up* without fully developed functionality) is available, test scenarios can be created that reflect the context of the user as realistically as possible. Users can perform simulated tasks (cf. Borlund 2016) with the proposed solution and comment on their actions through *thinking aloud*. These tests can take place under laboratory conditions in a usability lab or in a corresponding remote environment, for which appropriate equipment such as eye trackers, audio and/or video recording software etc. is required. Sometimes a more individual atmosphere is appropriate, e.g. for user tests in the mobile area (smartphones, tablets, data glasses etc.) or in the special area of car multimedia tests using driving simulators. If test persons and test leader(s) cannot meet at the same location, various remote options are available, e.g. if test persons are restricted in their mobility or are located in another country or continent (e.g. when developing web applications for new markets). In order to always give developers an impression of their future users, so-called personas are used, which represent visual representations of user stereotypes. Physical limitations rarely occur here and Buß (2009) mentions further pitfalls.

As shown above, UX issues sometimes require more complex techniques to align the systems accordingly. Here, too, there are already tools in the form of questionnaires and the like. For example, in order to survey the emotions or aesthetic perception of users when interacting with a system, Hassenzahl et al. (2003), for example, proposed the AttrakDiff2 questionnaire, which works with semantic differentials and evaluates pragmatic and hedonic quality. Moshagen and Thielsch (2013) developed the so-called *Visual Aesthetics of Websites Inventory* (VisAWI), which is widely used. The recording of facial expressions (cf. Fasel/Luettin 2003) was also used to assess the emotional situation of the users. The *Self-Assessment Manikin* (SAM) method also attempts to survey emotions by the users selecting a representation that applies to them. Further experiments have tested what role e.g. aesthetics plays within user interfaces. Lindgaard et al. (2006) were able to show that after a viewing time of only 50 milliseconds, users already made a fairly consistent judgement about the aesthetics based on a spontaneous first impression.

Good experiences have also been made with a mixture of methods, e.g. by recording the user tests and simultaneously measuring physiological reactions (skin conductivity, pulse, pupil size etc.). In particular, the joint examination of the combined recordings (*stimulated recall* method) carried out with the test subjects showed great potential (see Irle 2017) for successful interpretation.

The constant further development of novel interfaces, e.g. in the field of virtual reality or immersive systems, leads to an expansion of information and action options and to a more abstract and indirect HCI, which in turn requires novel methods of development and evaluation. However, the goal of HCI must remain to analyse and support the strengths of the various interaction partners.

HCI systems that aim at accessible interaction and special handicaps of users usually require an adaptation of the methods.

3.2 Evaluation with regard to accessibility

Various methods, procedures and tools are available for the evaluation of HCI with regard to usability or user experience, but these must be adapted in the context of accessible HCI offerings. Due to the diversity of barriers, it is often not possible to conduct large-scale user tests with an adequate number of test persons. Help is provided by surveys in so-called *user panels* or recently also via *crowdsourcing*. *User panels* compile a pool of potential users who participate in regular meetings and contribute to the quality of a product in the development process. They identify problem areas and provide ideas for improvement potential. *Online panels* are also possible, which operate virtually. With *crowdsourcing* (a combination of crowd and outsourcing), small work processes are usually outsourced to a large number of volunteers who, for a small fee, perform certain tasks. Simulation tests that simulate certain handicaps are used several times, e.g. by means of distorting glasses or mobility-restricting full-body suits. So-called conformance testing is performed to align the user interface with the directives.

The WAI of the W3C offers a guide that proposes a three-part evaluation that includes a heuristic expert walk-through, a manual or automated conformance check, and a realistic user test. In the first component, experts put themselves in the shoes of the users and investigate all possible ways of interaction. Conformance testing examines whether all information and com-

ponents of the user interface are *perceptible* from the different perspectives (i.e. whether they are possibly occupied with alternative media), *operable*, *understandable* and *robust*. For the user tests it must be ensured that all possible user groups are represented. The four principles mentioned above are assigned to 12 general guidelines, which in turn branch out into 61 success criteria (cf. Carstens 2015: 194 f.). The success criteria are assigned three objective conformity levels (A, AA or AAA), which allow a gradual classification of the achieved solution. Further W3C guidelines formulate requirements for the accessibility of browsers and authoring and development tools (cf. Carstens 2015: 196).

For the non-web-based HCI, the focus is on the above-mentioned standards for software accessibility of DIN EN ISO 9241-171, which were published in Germany in the year 2008 as the guideline "Ergonomics of Human-System Interaction". The DIN EN ISO 9241-171 contains a total of 142 guidelines with a test checklist (cf. Carstens 2015: 197 f.). As shown above, the standards of accessibility and usability meet here in the course of universal design.

Sünkler (2015) presents a systematic compilation of evaluation tools for automated accessibility tests related to the web, which give developers and designers hints where possible barriers might exist. They include methods from the fields of software and usability testing. An example of such tools, which is also applicable for the German language, is called AChecker. For an overview, please refer to Sünkler (2015: 236 ff.).

4 Principles of accessible user interfaces

There are many different approaches in the research literature, which on the one hand target specific barriers, and on the other hand address barriers that require individual solutions. Although newer developments such as wearables, smart home, Internet of Things, virtual reality do not have accessibility as their primary goal, they do provide many options for supplementing or replacing human senses, compensating for handicaps or demonstrating other processes. In some cases, these alternative interfaces also extend the range of modalities for people without handicaps (cf. Weber 2015).

- A first and rather simplistic approach is to exchange the senses and address other channels. This means that in the case of visually impaired or blind users, the sense of hearing in particular is used and vice versa. For example, if a user cannot operate the keyboard and perceive visual output, screen readers or spoken instructions are used. In the case of a hearing impairment, visual signals take over the function of acoustic signals. If both vision and hearing are impaired, haptic sensors are checked for their possible use.
- There has also been a significant increase in personalisation concepts that provide for individual settings, e.g. with regard to letter size, volume, use of colour and contrast, etc.
- In the context of web accessibility, which is characterised by the rapid development of new web technologies and applications, the main focus is on the separation of content and layout and on the systematic structuring and description of content media (text, graphics, audio and video files, etc.), thus enabling various options that are conducive to accessibility. For example, illustrations are supplemented with additional textual information that screen readers can access (see the contributions of Schütt and Hellbusch in this volume). This is partly accompanied by further advantages e.g. for search engine optimisation.
- In addition, there is the use of so-called assistive technologies that can support people with disabilities, e.g. screen readers, Braille displays, text-to-speech applications, on-screen keyboards with eye trackers, gaze technology, head or foot mouse, haptic feedback (see the contributions by Folta-Schoofs, Capovilla and Musenberg in this volume).

5 Examples

The selection of interfaces and proposed solutions presented here is not intended to be exhaustive, but rather attempts to highlight some trends. The lively activity that can be observed in the context of accessibility shows that the topic is actively being "experimented" with.

Billah et al. (2017) question the ubiquitous accessibility of visually impaired people in their contribution. They note that screen readers still have major limitations, they partly do not have any benefits, and overall there are still major research deficits.

Rozado et al. (2017) developed a software system *FaceSwitch* that helps people with limited mobility to interact efficiently with a computer without having to use their hands. For this, they combine gaze tracking with facial expressions, whereby gaze is used to point at interesting objects and different facial expressions (smiling, opening the mouth, raising eyebrows, twitching the nose) are used to trigger the function. In comparison to other systems, a higher speed in task solution could be achieved.

Rodrigues et al. (2017) propose a service named *Hint Me!* that helps blind people learn how to use a smartphone. The focus is not, as in previous studies, on text input, but rather on the general acceptance of a service in the form of a collective exchange of knowledge. The central element is a permanently present help button. Once the user has pressed the button, he or she can ask a question which, together with the screenshot of the page on which the user is located, is forwarded to various social media and to a knowledge base. Pressing the button for a longer time plays the answer back and can be listened to several times.

Ezaki et al. (2004) present a system that locates text in a natural environment (tested with photographs) to assist visually impaired or blind people. The authors primarily cite examples of traffic signs or warnings (e.g. a stop sign at an intersection). People with a visual handicap should be able to move around better unaccompanied in the open air. Using a camera placed on the shoulder of the visually impaired person allows texts in the surrounding area to first be identified and then read aloud to the person. People can also be supported when shopping by having corresponding product names or prices communicated to them. The necessary technological foundations can be found in the field of text recognition and extraction as well as in text-to-speech implementation.

6 Conclusion

As more and more information offers and services are being shifted to the web and a constant growth of non-web-based applications can be observed, accessible HMI has started to play an increasingly important role. In order to enable all people to participate in information and knowledge, accessibility must be guaranteed. *Usability* and *UX* research provide elaborate methods, which, when applied to accessibility, usually have to be adapted. However, the requirements between *accessibility* and *usability* show significant overlaps and can mutually benefit from the respective methodological and experiential know-how. In terms of user experience, however, accessible systems should go beyond aspects of effectiveness. It is important that the goal of accessibility is pursued from the beginning of the development process in order to proactively counteract inadequacies through appropriate design. This could help general and self-evident accessibility in HCI to achieve a breakthrough.

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Marie-Luise Schütt

Alternative texts as a fundamental design element of accessible educational processes

1 Starting point: On the importance of visual material for learning and teaching processes in schools and universities (as well as resulting consequences for individual learners)

Picture stories in foreign language teaching, caricatures in history lessons or bar charts in lectures – a wide range of images is regularly used in the school and higher education sector for the targeted support of learning and teaching processes.

The significance of visuals for the teaching and learning process has been known for some time. From a historical point of view, visual aids have been used since the 17th century in order to illustrate complex issues or stimulate mnemonic thought processes (Reinmann 2015: 46). The rapid processing of essential information can also be supported by the use of clear illustrations. In order to stimulate cognitive thought processes, the combination of visual and text material is the predominant method in the education sector (e.g. lectures with presentations, texts and visual material in traditional textbooks or non-fiction books …). "Aside from these cognitive functions, pictures can also arouse interest and motivate people to learn or they can have a decorative function and therefore influence the emotional aspect of learning" (Reinmann 2015: 46; English translation of the German original). In this way, specific teaching and learning methods, such as visual stimuli, focus on the immediate effect of pictures on the learners. The teaching of educational content is undoubtedly hard to imagine without the use of pictures – especially in the age of digitisation.

But not all learners benefit from the special potential of pictorial representations. If picture stories or caricatures do not have verbal or written descriptions,

visually impaired learners are denied access to educational content. But visually impaired learners are not the only group with limited participation options in education. Individuals with learning disabilities and people with autism spectrum disorders may also need additional information in order to be able to put the caricature into the context of the lesson's content. In the education sector, the exclusive use of pictorial representations can lead to mechanisms of exclusion, resulting in unequal participation in education.

2 Short definition of "alternative texts" and rationales for the use of alternative texts in the education sector

In order to ensure that every learner can participate in education, accessibility to visual material must be a given. In this case, alternative texts are suitable for providing the image information in a different or optional format.

Alternative texts are a "textual alternative to non-text content" (Barrierefreies Webdesign 2018; English translation of the German original). Alternative texts or text alternatives are "texts that are used instead of images and that are meant to provide relevant information" (BITV-Lotse 2018; English translation of the German original). The utilisation of assistive technologies (screen readers, Braille displays) ensures the accessibility of the visual material: The alternative text is read out loud by a screen reader or displayed via a Braille display.

On the one hand, the use of alternative texts originates in the human rights agreement of the UN Convention on the Rights of Persons with Disabilities and on the other, the use of alternative texts approaches the learning topic from various angles in terms of Universal Design.

2.1 Rationale I: UN Convention on the Rights of Persons with Disabilities

By signing the UN Convention on the Rights of Persons with Disabilities (UNCRPD), Germany is required to ensure equal and non-discriminatory participation of people with disabilities in education (UN 2006/2008: Art. 24).

This measure highlights that everybody has the right to education – a right that is anchored in the Universal Declaration of Human Rights ("Everyone has the right to education", UN 1948: Art. 26). States party to the UNCRPD, as well as to the Universal Declaration of Human Rights (UDHR), are obliged to ensure discrimination-free access to educational opportunities for everyone. The UNCRPD clearly focuses on and substantiates human rights for the group of people with disabilities.

According to the UNCRPD, participating nations should take appropriate measures ("reasonable accommodation") in order to promote equal access to education for every individual. Article 2 of the UNCRPD states that "reasonable accommodation" means "necessary and appropriate modification and adjustments […], where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms" (UN 2006/08: Art. 2). If visual material is used without any adequate alternative in schools and universities, certain groups of people will be excluded. The images are barriers that hamper access to information. In this context alternative texts can be defined as "reasonable accommodation" (Degenhardt 2016a). The use of alternative texts ensures that visual information is accessible to everyone. If there is no "reasonable accommodation" (here: alternative texts), it is hard to ensure the equal participation of every individual in education, for example of persons with visual impairments. Considering the normative understanding of the UNCRPD, non-existent image information leads to discrimination against certain groups of persons in educational processes ("discrimination on the basis of disability"), which does not promote joint (inclusive) learning and should therefore be avoided (UN 2006/2008: Art. 2, Art. 24).

In addition, it is necessary to mention the Marrakesh Treaty (WIPO 2013) that entered into force on 30 September 2016 (DBSV 2018a). The international treaty presents regulations to facilitate the production as well as the (inter-) national transfer of accessible published works. Its main goal is to make literature accessible for people with a visual or reading impairment. Germany is currently considering the ratification of the Marrakesh Treaty. The German Federal Ministry of Justice and Consumer Protection has presented a first bill on the subject (DBSV 2018b). A successful implementation of the Mar-

rakesh Treaty would make a major contribution to implementing the essential demands of the UNCRPD (e.g. Art. 9: access to information, Art. 24: educational participation …).

2.2 Rationale II: Universal Design for Learning

Alternative texts have an important function: Not only do they improve educational participation options for people with visual impairments, they also meet the heterogeneous needs of different groups of learners. Article 2 of the UNCRPD underlines the significance of universal design for the organisation of future (educational) processes. According to the UNCRPD, "'Universal design' means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. 'Universal design' shall not exclude assistive devices for particular groups of persons with disabilities where this is needed" (UN 2006/2008: Art. 2). As outlined above, the exclusive use of images does not constitute a universal solution. In fact, adaptations for certain users are necessary, with the combination of images and alternative texts being similar to the concept of Universal Design.

In accordance with the concept of Universal Design for Learning, which aims to transfer the general principles of universal design to alternative text design as an essential design element of learning arrangements, teaching content has to be adapted to the needs of all learners in the best possible way (Schlüter/Melle/Wember 2016: 274 ff.). Universal Design for Learning is based on research in learning theory and developmental psychology as well as findings from neuroscience (Hall/Meyer/Rose 2012: 5; Rapp 2014: 15; UDL 2018a). The development of the concept was influenced mainly by the works of Vygotsky on the zone of proximal development ("Scaffolding") and Piaget's reflections on developmental psychology (Piaget 1988; Rapp 2014: 267, 313, 318; Vygotsky 1978). Universal Design for Learning is also based, among other things, on the research of the neuroscientists Gazzangia, Ivry and Mangun (Gazzangia/Ivry/Mangun 1998). Based on these and other scientific insights, "interindividual differences" with regard to learning play a key role in the concept of UDL (Schlüter/Melle/Wember 2016: 274). Universal Design for Learning is based on neuroscientific research that has identified three

primary neurological networks that impact learning (Recognition Network: "What" students learn, Strategic Network: "How" students learn and Affective Network: "Why" students learn) (Hall/Meyer/Rose 2015: 2 f.; Rapp 2014: 15 ff.; UDL 2018b). However, the specific capacities of these neurological networks differ from individual to individual. In order to meet the individual needs of every learner, there has to be a wide range of learning opportunities. There are three available principles including further reference points (so-called checkpoints) that help optimise learning opportunities for every person (Principle 1: Provide multiple means of representation for information, Principle 2: Provide multiple means of processing information and demonstrating learning outcomes, Principle 3: Provide multiple options to promote learning engagement and motivation) (Schlüter/Melle/Wember 2016: 275). With regard to the first principle, alternative texts, which are essential for some students, can be used as means for all learners. According to Meier, everyone has a personal preference when it comes to which sense is used in the learning process. While some people best access new information by using their sense of hearing, others prefer to learn through observation, or actively touching. That is why student learning styles fall into three different categories: visual, auditory and haptic learners (Meier 2006: 97 f.). Since visual learners benefit the most from images, there should be alternatives for students who prefer other learning styles. In this case, the use of alternative texts helps learners access not only visual realisations, but also verbal or written descriptions which could also be used auditorily via voice output. Thus, it is possible to support the individual learning processes not only of visually impaired students, but also of learners who retain information best when it is presented through sound and speech.

3 Basic information on the design of alternative texts

The use of alternative texts (or verbal descriptions) is a learning method that aims to increase the accessibility of educational opportunities. The growing need for diverse learning materials, which meet the requirements of heterogeneous groups of learners, goes hand in hand with the education policies

pursuing the goal of creating an inclusive school system in Germany. Following from this, alternative texts are appropriate tools of presenting visual contents in different forms. At the moment, however, alternative texts are just used as examples, e.g. for visually impaired students. This is, among other things, due to the fact that the provision of appropriate alternative texts is by no means an easy task. The fundamental goal of creating alternative texts is to ensure that the basic visual information is perceived with the help of the alternative text.

The following sections illustrate important criteria for the creation and design of alternative texts. The explanations are based on legal requirements (Ordinance on Barrier-Free Information Technology (BITV 2.0) 2011) as well as national and international guidelines from the education sector (Blista 2012; DIAGRAM Center 2018).

3.1 Basic dilemmas of creating and designing alternative texts

The creation of alternative texts is not unproblematic due to two basic dilemmas.

1. No alternative text without interpretation!

Texts should be written or verbalised as objectively as possible. However, comprehension of alternative texts is based on the perception of the source product (visual material) (Kitza 2015: 16). Hence, the choice of words and the use of language evoke certain semantic associations in the recipient of the alternative text, so that the alternative text therefore cannot be implemented without any form of the author's or recipient's individual interpretation.

The alternative text is the verbal or written translation of the visual perception of the image. Visual perception is shaped by several factors, e.g. previous knowledge, technical vocabulary and age. The same applies to the reception of visual information from the alternative text.

2. There is no "the" alternative text!

The specific creation of alternative texts is contingent on different factors (context, target group, range of application…), so that individual adjustments

to the needs of the target group may be necessary. Depending on the actual user group, it can, for example, be advisable to provide different alternative texts for one image.

3.2 Guidelines on the creation of alternative texts

Following current research findings as well as national and international guidelines on the creation of alternative texts, the following criteria are described as instructions in the pertinent literature (Blista 2012; Degenhardt 2016a; Degenhardt 2016b; NCAM/DIAGRAM Center 2015).

> "In order to create the alternative text, it is necessary to determine:
>
> - type (photo, painting, diagram, cartoon, organisation chart, mind map, concept map…),
> - structure and reading direction,
> - function,
> - details and basic information of the image.
>
> This information has to be
>
> - as objective/neutral as possible,
> - comprehensible,
> - effective,
> - and fully adapted to the context
>
> so that it can be presented in **a version** (continuous text, list…) **that is suitable for the readers**" (Degenhardt 2016a; 2016b; English translation of the German original).

In the following, I will present a full explanation of the recommendations on creating and designing alternative texts (Blista 2012; Degenhardt 2016a; Degenhardt 2016b; NCAM/DIAGRAM Center 2015).

Type: What type of image is it? Is it a photo, a painting, a cartoon, a diagram or an organisation chart? It is advisable to categorise the image (typification) (e.g. in the first sentence of the alternative text…), because subject-specific information is connected to the concrete image type. This provides the user group with a first idea about the information they can expect in the description. For example, a bar graph in the alternative text implies that the text will contain empirical data.

Structure & reading direction of images: Which structure and reading direction of the image should the alternative text follow? In contrast to text material that is read from left to right, the reading direction of images is not automatically prescribed. In order to convey the image information to the target group in a way that is as logical and structured as possible, the creator of the alternative text needs to define the structure and the reading direction.

The DIAGRAM Center, an initiative supported by the U.S. Department of Education, has published guidelines on the creation of accessible learning material (NCAM/DIAGRAM Center 2015; DIAGRAM Center 2018). These include a.o. recommendations on the creation of alternative texts. According to the DIAGRAM Center, it is advisable to offer a general description before focusing on specific details. But in some cases, it can make more sense to concentrate on a specific detail first, for example if this detail is the central motif of the image.

Function: What is the intended function of the image? The creation and design of alternative texts must be based on the picture function. In order to define the function of the image, it is necessary to analyse the associated text material. If the goal is to capture a certain atmosphere or mood in a picture, it can be useful to name specific adjectives. An alternative text containing only a few words can be enough to describe an image that has an illustrative function, because the assigned text material contains detailed explanations.

Details of the image: It is important to recognise the most relevant details of the image, so that the image description can refer to the respective topic.

Basic information of the image: It is important to collect the basic information that is transmitted through the image and to integrate it in the alternative text.

As objective/neutral as possible: Various forms of the alternative text are possible for any image. Depending on the choice of words, the user may have different associations with the image (Kitza 2015: 45). Based on these associations, the visual concept, "which depends on the creator's perception and choice of an expression" (Kitza 2015: 45; English translation of the German original), is formed in the mind of the user. "[…] (Due to the fact that) perception is subjective and cannot be deemed right or wrong, the description of an illustration or an image should, according to Gombrich, allow for a wide range of interpretation possibilities and not dictate a certain interpretation" (Gombrich 1984: 200; Kitza 2015: 45; English translation of the German original). The main purpose of the description should consist in describing what is actually depicted. Interpretations should be avoided if possible (NCAM/DIAGRAM Center 2015: 11).

By using the alternative text, the reader should rather have the possibility to interpret the image without being influenced.

Comprehensible: The alternative text should be created in such a way that it is possible for the recipient to understand the text material without requiring any further information. For example, the alternative text should not include new notions or concepts.

Effective: When it comes to creating an alternative text, it is important to focus on information that is relevant for the topic. Cognitive overload, which limits the working memory due to irrelevant information and therefore unnecessary cognitive processing, should be avoided (Sweller 2005; Schütt 2015: 94). Especially textbooks often provide detailed texts full of further explanations in order to describe a picture. If possible, these texts should be included in order to avoid unnecessary repetitions (NCAM/DIAGRAM Center 2015: 10).

Fully adapted to the context: The alternative text should be adapted to the context in which the picture is shown.

A version that is suitable for the readers (e.g. continuous text, list): The examples of the DIAGRAM Center show that creation of alternative texts depends on the target group (age, cultural background, specialised knowledge, the ability to use assistive technologies, e.g. Braille display…) (NCAM/DIAGRAM Center 2015: 9). Therefore, the alternative text needs to be adapted to the knowledge and skills of the learners (cf. Figure 1: Example of a tree diagram for learners in primary and secondary education). This means, among other things, that the alternative text has to be linguistically appropriate for its users, including (technical) vocabulary, syntax and choice of words. It is also important to note whether the potential readers understand and are able to use the Braille display's structuring "function" for bullet points. As shown in the example, bullet points are only used for advanced readers in secondary education. Bullet points have the advantage that it is possible to provide the image information in a few words. By contrast, primary education focuses on presenting the image description as short texts in order to avoid cognitive overload among the learners.

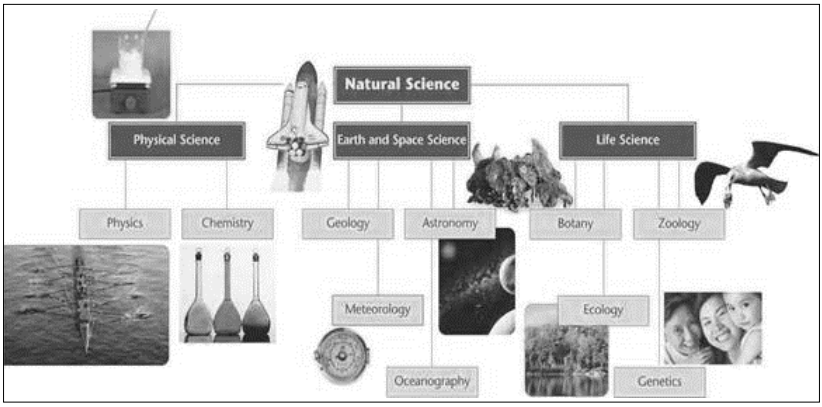

Figure 1: Tree diagram (from NCAM/DIAGRAM Center 2015: 37) © Pearson Education 2009

Alternative text for learners in primary education: "A tree diagram shows different branches of science. There are three levels, from top to bottom. The highest level is Natural Science. The next level has Physical Science, Earth and Space Science, and Life Science. Physical Science includes Physics and Chemistry. Earth and Space Science includes Geology, Meteorology, Astronomy, and Oceanography. Life Science includes Botany, Ecology, Zoology, and Genetics" (NCAM/DIAGRAM Center 2015: 37 f.).	**Alternative text for learners in higher class levels (secondary education):** "A tree diagram shows different branches of science. There are three levels, from top to bottom. The highest level is Natural Science. The next level has Physical Science, Earth and Space Science, and Life Science. Physical Science • Physics • Chemistry Earth and Space Science • Geology • Meteorology • Astronomy • Oceanography Life Science • Botany • Ecology • Zoology • Genetics" (NCAM/DIAGRAM Center 2015: 38).

Further recommendations on the creation of alternative texts, with a special focus on linguistic aspects, are listed in the handout of the DIAGRAM Center (NCAM/DIAGRAM Center 2015: 13). According to the handouts, it is advisable to mainly use active verbs in the present tense (including basic grammar rules and punctuation). In order to reduce text length, the DIAGRAM Center recommends, among other things, the use of parentheses. It is important to facilitate comprehension of the alternative text for users, which is why the main text should not be neglected. It promotes an understanding of information in the alternative text. Several examples on the creation of alternative texts are provided in the national and international handouts (Blista 2012; NCAM/DIAGRAM Center 2015).

4 Research desiderata

The aspiration to provide educational opportunities for heterogeneous groups of learners, which includes the provision of alternative texts, is a comparably recent one. National and international research projects recently published first scientific studies on the creation of alternative texts that meet the needs of heterogeneous groups of learners (Blista 2012; DIAGRAM Center 2018). The criteria for the creation of alternative texts also highlight that specialised knowledge of this topic is already available. But it is obvious that further research is nonetheless necessary (Degenhardt 2016a). In order to generate more specialised knowledge about the creation of alternative texts, it is important to conduct further research.

Research desideratum I: Detailed information on the creation of alternative texts in the education sector

The creation of alternative texts is a topic that also requires further research.

To ensure that all students – especially visually impaired students – have access to the image information, alternative texts are one possible way to reaching this goal. But do alternative descriptions always provide an adequate alternative? Is it even possible to say that alternative texts are "adequate teaching material"? There is no doubt that it is impossible or barely possible to put some ideas into practice (e.g. evoking certain emotions while looking at a picture).

The increased amount of written (verbal) input influences the reception of educational content. Until now, only little research has been conducted on the maximum length of alternative descriptions for specific age groups. Another aspect that needs more investigation is the role of decorative elements during the image viewing process. According to the Web Content Accessibility Guidelines (WCAG) as well as the Ordinance on Barrier-Free Information Technology (BITV 2.0), decorative elements (e.g. a recurring logo in a PowerPoint presentation) should not be described (BITV 2.0 2011; WCAG 2018). The omission of the description of decorative elements is explained by the fact that these elements do not provide any relevant information. But then the question arises who – and according to which criteria – decides whether something is useful or not. The results of qualitative surveys among users of alternative texts

show that everybody prefers a different amount of information. This means that some users are interested in the description of decorative elements (Kitza 2015: 158).

Research desideratum II: Research on the benefits for all learners

According to the "Nachteilsausgleich", a German law that aims at the support of impaired people, visually and physically impaired students have the right to use digital textbooks in school (e.g. BSB Hamburg 2013). In order to ensure the best possible access to textbooks, students who are blind or visually impaired receive digital textbooks that provide alternative texts. In order to truly identify the benefits of using alternative texts according to the concept of Universal Design for Learning, it is important to conduct research projects in inclusive schools and integrate all potential users (students with learning disabilities or speech impairments, students whose native language differs from the teaching language…) into the knowledge process. Another important aspect is adherence to formal regulations, such as the copyright laws of textbook publishers, and solving problems that may occur due to these regulations.

Research desideratum III: Alternatives to presenting the image information in writing

In contrast to a "quick" look at the image, access to alternative texts is often associated with significant cognitive and temporal effort. Visually impaired learners receive a lot of verbal descriptions in school, so that their access to the educational content is ensured. Learners who are visually impaired therefore tend to be prone to "verbal" overload (Blista 2012: 5). In order to provide more access options, there needs to be a constant review of whether it is possible to replace verbal descriptions with tactile learning material or acoustic material that does not require verbal input. Presenting the image or the alternative text as an audio file (sound, noise, radio play, …) is a good way to support the learning process. Use of tactile images can also be helpful for learners who are not blind. Following the concept of Universal Design for Learning, researchers must investigate whether the alternatives – aside from the text material – are useful for learners and how they can be didactically integrated into the teaching process. The project VISCH (visualised information in schoolbooks) refers

to an example in the area of mathematics (Blista 2012: 11). In order to solve a mathematical problem, the students receive a 3D model. This 3D model is also an opportunity for students with limited spatial abilities to understand the task. The school's 3D printer could be used to print 3D files (Blista 2012: 25; DIAGRAM Center 2018). Other projects, such as the Tangram project of the TU Dresden, also refer to this need (Tangram 2018).

5 Conclusion and outlook

In terms of educational policy, the creation of accessible (barrier-free) educational opportunities plays a major role in the establishment of inclusive schools and universities in Germany. The provision of alternative texts is very important in this context, especially in terms of making educational opportunities more accessible (barrier-free) to heterogeneous groups of learners. In the next years, appropriate measures to make educational opportunities more accessible have to be applied more consistently in schools and universities. The focus needs to be not just on visually impaired students, but also on the general utility for students without special educational needs in accordance with the Universal Design for Learning. The necessity for action is greater than ever before due to the fact that the effect of images in the educational sector has also increased in the age of digitisation. A great deal of research on the use of images and their influence on the teaching of educational content is currently being conducted.

Digital tools that optimise social participation for disabled and non-disabled people are being developed on a daily basis. The same developments can be observed in the creation of alternative texts. New media devices that can automatically create alternative texts are currently being produced and tested. These devices could be a great tool for teachers when creating alternative texts, which can also benefit the specific preparation of educational opportunities. But it should be noted that the application of universal texts is nonetheless limited. In order to ensure a goal-oriented use of alternative texts, individual adaptations to the heterogeneous needs of learners will also be necessary in the future.

At this point in time, there are only a few recommendations for teachers on the creation of alternative texts – mainly formulated by American researchers (Degenhardt 2016b; DIAGRAM Center 2018). According to these recommendations, it is possible to summarise that the creation of "customised" alternative texts is time-consuming and demanding. That is why alternative texts should ideally be created by qualified professionals. But across the country, there are barely any experts who provide help for teachers in schools and universities (e.g. KIT: Karlsruhe Institute of Technology – Study Centre for the Visually Impaired, Center for Inclusive and Barrier-Free Schools at the University of Hamburg, DoBuS – Department of Disability and Studies at the TU Dortmund University, Working Group for Education of Blind and Partially Sighted Students at the Technical University of Dresden or mobile instructors for blind and partially sighted people at regional state levels). It would be advisable to establish a national expert network, similar to the DIAGRAM Center in America, that provides tools and best practice examples and refers to regional support tools (DIAGRAM Center 2018). The importance of adequate service offerings, which are, for example, useful for the creation of accessible documents, has increased – especially with regard to current developments, such as the pending ratification of the Marrakesh VIP Treaty (WIPO 2013).

Apart from that, it can be expected that further research would lead to new insights, such as general benefits of and the need for alternative texts. On the one hand, these research findings are very useful for the concretisation of general recommendations on the creation of alternative texts. And on the other hand, in accordance with the concept of Universal Design for Learning, these new insights could be used to further research opportunities for learners without special educational needs using alternative texts.

Irrespective of the benefits of alternative texts for learners without special educational needs, the significance of image alternatives – for example for visually impaired learners – should also not be neglected due to the fact that alternative texts can be considered an adequate concept in terms of creating accessible educational resources. Without accessible (barrier-free) educational resources, certain groups of people will become isolated. In order to avoid isolation or exclusion from educational contents, all opportunities of educational participation have to be constantly reviewed.

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Dino Capovilla

Technology-aided communication for people with visual impairments

In the context of accessible communication, a visual impairment means that stimuli perceived via the visual sensory channel and complemented via other sensory channels are not sufficient in reconstructing reality with all the visual information required to base actions upon. The resulting impairments are both many-faceted as well as far-reaching and require compensation.

Therefore, assistive technologies are of crucial and increasing significance. By means of assistive technologies, the quality of the stimuli to be received can be improved or replaced by other stimulus patterns containing the same information. The use of assistive technologies can aid the process of interpretation of the perceived stimulus patterns and enables a focus on the relevant information. Finally, assistive technologies grant access to extensive information and thereby to self-determined knowledge gain for visually impaired people.

In concrete terms, this means that assistive technologies for visually impaired people provide self-determined access to package inserts, road signs, text messages, content on boards, books, scoreboards, recipes, newspapers, bank accounts, product descriptions, dictionaries, restaurant menus, social networks etc. In addition to access to information, assistive technologies simplify active communication. Visually impaired people can largely also use email programs, word processing programs, online shops, spreadsheet applications, digital forms, online booking systems etc. The increase in self-determination as described here reaches far beyond the practical benefits. Some personal communication content, for example, might be unsuitable to be shared with an assistant (compromising searches, purchase of certain medications, love letters, consumption of certain media, finding of certain establishments etc.).

Basically, there are two different approaches to the configuration of technology-aided compensation: On the one hand, the subjective condition of the

individual person can be adapted to the requirements related to the provided information. On the other hand, the provided information itself can be modified to such an extent that it grants access to as many people as possible.

In the case of technology-aided compensation in the context of the adaptation of the subjective conditions, technologies attempt to improve the physical, sensory or cognitive capacities of people with disabilities to increase their independence in a large range of circumstances and environments and to not focus on the idiosyncrasies induced by their disability (Story/Mueller/Mace 1998). In contrast, this is countered by approaches with technologies employed to remove barriers and, in the sense of a universal design, for the configuration of products and living environments that can be used by as many people as possible, independent of their age or abilities (ibid.). As the ideal of a universally designed world is practically unachievable in its entirety, assistive technologies will still be needed in the future, which is why this article deals with these very technologies.

Nowadays, there is a wide variety of assistive technologies that attempt to deal with the subjective character of each of the diverging types of visual impairments. The crucial concepts that these concrete assistive technologies are based upon will be presented hereinafter.

1 Screen reader technology

While assistive technologies were initially isolated tools specifically designed for people with disabilities (e.g. prostheses, Braille typewriters, devices for colour recognition), there has been an attempt in recent decades to extend the use of conventional products by assistive technologies in order to make them usable for people with disabilities. The reason for this development is mainly the preference of people with disabilities themselves, as they naturally appreciate the possibility of using the same hard- and software as people without disabilities (Shinohara/Wobbrock 2011). This is entirely understandable: The use of conventional hard- and software may decrease stigmatization (Böing 2013; Capovilla/Hubwieser 2013; Hofer 2008) and therefore tangibly enhance social participation.

As a result of this development, the screen reader technology has now evolved into a stable and well-engineered standard (Miesenberger 2015). This is mainly possible since the crucial interaction concepts – such as windows, icons, menus and cursors (Müller-Prove 2002) – have not significantly changed over the last decades (ibid.). They can be arranged in a virtual workspace where users can navigate to them in various ways (Point & Click, Drag & Drop etc.) by use of a cursor tool (Miesenberger 2015). The term "graphic user interface" has become the established term for this navigation concept. Its importance is shown in the fact that there are hardly any devices nowadays that are not based on this concept.

The success of the graphic user interface can be explained by two main aspects: intuitive handling as well as related mouse control on the one hand (Capovilla/Hubwieser 2013) and the clear standardisation of the operating elements on the other (Miesenberger 2015). While the advantages of intuitive handling and mouse control are inapplicable for visually impaired people, the extensive standardisation of the interaction concepts enables the development of reusable alternative control strategies.

The significant challenge for visually impaired people is the abstraction of a mainly vision-oriented system to such an extent that the contained concepts are understood without a connection to concrete arrangements on screen. Based on this understanding, alternative, generally non-intuitive control strategies must be learned. Thus, the non-visual-oriented use of devices primarily consists of: identification as well as understanding of the structure and the displayed elements of the graphic user interface, retrieval of the acquired and therefore familiar operating concepts for these very elements and application of one of these operating concepts.

A screen reader can be installed on a conventional computer, a standard smartphone or on other devices. Its essential task is to simplify the multidimensional screen content to such an extent that this content can be communicated via voice output or Braille characters. This can only be achieved by information provided in a linear form as a simple text. Despite the suggestive term, the decisive task of a screen reader is not to read the screen content out loud, but to reduce it to the necessary and relevant parts of the information and to linearise it for further processing.

Meanwhile, a variety of commercial and free screen readers conceptualised for different platforms on stationary or mobile devices are available. In recent years, the majority of producers of mobile devices have been integrating their own screen readers as firm components of their operating systems (Brady et al. 2013).

2 Data entry

In the context of data entry, two categories must be distinguished: entry of content data and control instructions. While content data generally involves text but nowadays also voice mails or images, control instructions are configured to determine what needs to be done with these content data.

When entering not predominantly text-based data such as voice mails, images, videos etc., visually impaired people are confronted with the same problems as everyone else and equally benefit from technologies designed to improve the quality of entries. In this context of data entry in the form of text, a keyboard is still the most efficient option. It is thus essential for visually impaired people to be touch typists since visual support for the entry process is either impossible or involves a considerable loss of time. With regard to alternatives with subsequent speech recognition like voice entry, visually impaired people encounter the same obstacles as everyone else. Mobile devices without keyboards render the text entry even more onerous for visually impaired people. When entering text via touch screen, a finger is put on the displayed keyboard. As long as the finger is put on the touch screen, the voice output keeps repeating the chosen letter. The next step is to move the finger until the desired letter has been identified by means of the acoustic feedback. The letter is entered by removing the finger from the screen. This procedure is obviously time-consuming and laborious. Efficient text entry without seeing the touch screen therefore remains problematic (Azenkot/Lee 2013).

If there is a keyboard available, control instructions are entered via shortcuts. Against this background, visually impaired people considerably benefit from complementary key-based navigation concepts which, today, are available for most operating systems and applications. Most of the time, these naviga-

tion concepts are incomplete, which is why it is necessary to complement the functionality of the screen reader with shortcuts and a keyboard-based mouse control as much as possible.

Specific shortcuts in the screen reader are used in order to, for example, read texts aloud in a particular manner or to spell words, to read out the content of certain sectors of the windows or, e.g., to access details on the formatting of individual characters. For the key-based mouse control of the screen reader, the cursor is, after activation, moved across the screen by using the arrow keys while the names of the objects underneath it are read out loud. The plus and minus buttons, for instance, represent the left and right mouse button on the keyboard. This principally enables the use of Drag & Drop. Some screen readers offer the possibility to save individual control sequences (scripts) and use them e.g. via shortcuts. The advantage of such scripts is that access can be granted to a software that may not be actively supported by a screen reader due to poorer circulation. This could be important at school or at work if a specific educational software or a particular data management program is used which the user, by default, does not have access to.

Mobile devices usually do not have keyboards and since the establishment of smartphones and tablet computers, even numeric keypads have disappeared. This appears to be problematic particularly for visually impaired people as these keypads can be considered essential reference points for them. One alternative to a keyboard is the voice control available on most mobile devices although it can only support navigation and not full control. Nevertheless, compared to average users, visually impaired people use voice control more often as a complementary navigation concept (Azenkot/Lee 2013).

Today, multi-touch technology seems to have become established as the central navigation concept, also for visually impaired people. Therefore, specific swiping gestures and touch sequences are determined and connected to features. It is a major advantage that, except for text entry, the handling of mobile devices can basically be reduced to hierarchic menu control (Kane et. al. 2008). Such a hierarchic menu control could be structured as follows: It may be possible to navigate through menus by swiping from bottom to top or vice versa while entries are read out loud. By swiping from left to right, the corresponding submenu is opened, whereas swiping in the opposite direction

closes the submenu and then displays the menu of the above hierarchy level again. A menu option could be chosen by using a second finger to touch the screen and the object-related context menu could be opened by tracing a circular swiping gesture.

3 Data output

Concerning data output for visually impaired people, the screen content reduced to a simple text by the screen reader generally needs to be outputted acoustically or tactilely.

The acoustic implementation may occur via voice output. Voice outputs use voices with differing quality and production processes (Hess 1996). The choice of each tone of voice depends on subjective needs and preferences. While a well-written novel requires a natural tone of voice, it can be more important in the context of an extensive introduction to business studies that the spoken output simply remains comprehensible despite an increased speaking speed.

Aside from the voice output, it is also possible to use Braille for data output. Braille is a form of tactile writing where letters are represented by a combination of palpable raised dots. A refreshable Braille display offers the option to output the data prepared by the screen reader in Braille. These types of refreshable Braille displays usually consist of 20 to 80 modules (units that can represent one character) with eight pins each (eight-dot Braille). Depending on the character, the dots are raised by means of voltage, whereby palpable representations are generated.

Voice output and refreshable Braille displays have different advantages and disadvantages. A crucial advantage of voice output is its high reading speed. Trained adolescents and young adults have an average reading speed of 200 to 350 words per minute (Denninghaus 1996). Trained Braille readers who have been blind since early childhood can decipher 100 to 150 words during the same amount of time, whereas people restricted by a profound visual impairment can read 40 to 80 words written in black-print per minute (ibid.). By using voice output, the speed of trained black-print readers without visual impairments can effortlessly be achieved. A major advantage of a refreshable

Braille display, however, is the training of orthographic and grammatical competence which might not be sufficiently developed or fostered by the exclusive application of voice output. On the other hand, voice output is extraordinarily suitable in order to find transposed letters or syntax errors (Mulloy et al. 2014) since all letters are read out loud sequentially and are not interpolated by the application as they would be by human readers. The fact that the auditory sensory channel is not required in order to use a refreshable Braille display is especially advantageous during educational processes or at workplaces focusing on human interaction. It is complicated to simultaneously listen to the voice output and to follow the oral explanations of a teacher or to react as an employee of a call centre to the requests of clients. In addition, a permanent acoustic irradiation is also exhausting where a refreshable Braille display can therefore offer down-time.

Finally, the use of magnifying software provides a third alternative for data output, although its use is reserved for people with sufficient residual visual abilities.

Magnifying software enlarges the different sections of the screen in a number of ways (Kalina 2011) and thus everything that can be displayed on a screen (such as texts, scanned texts, pictures, video games, webcam pictures etc.). The complexity level of magnifying software compared to that of screen reader technology is correspondingly low. Many operating systems already use magnifying software, e.g. in the form of a screen magnifier, by default. Unlike these free output applications, commercial magnifying software is equipped with an advanced magnification factor, edge smoothing in order to reduce the visible pixel structure, the possibility to invert colours or to choose certain colour schemes, and sometimes with a read-out-loud function or better focus tracking (shift of the magnified section towards the cursor or the prompt).

A significant disadvantage of magnifying software compared to screen reader technology, however, is the increased amount of time required in the work process itself, which may prevent the development of competitive work performance. In the case of focus tracking, the increase in required time stems from the additional visual performance and especially from the necessary supplemental interventions when the application of the focus tracking is not

successful. Furthermore, the necessary mental reconstruction of the screen content, which has only been perceived in excerpts, as well as the additional associated actions for re-orientation can also increase the required time. Finally, the screen reader, in preparing the data, does not consider numerous details that are irrelevant in a given moment which, in the case of use of magnifying software, need to first be recognised through additional visual performance and ignored afterwards.

Then again, the advantages of the graphic user interface (such as intuitive guidance, mouse control etc.) can be reaped by using magnifying software, which also significantly shortens training time for visually impaired people and expands the number of possible users. It also provides opportunities for those people who do not want to attract attention to their moderate visual impairment by making it less obvious in public (e.g. on the train). Without a screen reader or magnifying software, it would be necessary to get closer to the objects; this would be noticeable by others, may lead to stigmatization and in the end, is not advisable due to the resulting unnatural body posture (with regard to back, shoulders, knees…).

4 Magnification

While screen reader technology can be considered a viable alternative to magnification for use in end devices, everyday life often lacks the provision of this alternative. While people without residual vision are forced to cope with non-visual substitutes perceived via other sensory channels, people with some residual vision can, however, improve or extend the visual stimulus pattern they perceive by using magnification strategies. This can be relevant insofar as diverging consequences may result for the target group's specific accessible communication. For the target group consisting of people with residual vision, magnification can generally be achieved by getting closer to or enlarging objects as well as by using optical or electronic assistive technologies.

4.1 Getting closer to or magnifying objects

By getting closer to an object, experience shows that magnification of the object can be achieved. Since this magnification can only be traced back to a physiological approach, assistive technologies focus on mechanical appliances capable of aiding this approach. Such appliances might be swivel arms for computer monitors, book-stands or swivel-mounted clipboards. Departure boards at eye level in stations or the use of non-recessed display cases and showcases that can be physically approached also belong to the field of approaching, or getting closer to objects.

A typical example of object magnification is large print. For this purpose, the font size in a document is usually changed to 18-point (AFB 2013). Another option is the magnification of an information medium itself by means of a photocopier (e.g., doubling the size of a document from DIN-A4 to DIN-A3). It is also possible to increase the font size on boards or when using a projector.

Although large print actually leads to an increased average reading speed for visually impaired people (Lueck et al. 2003; Lovie-Kitchin/Bevanm/Hein 2001), these measures are extremely limited. This is mainly due to the limited possibilities related to the magnification factor and the resulting dimensions of the information medium. A DIN-A4 page magnified by a factor of 4 already corresponds to the DIN-A0 format and seriously lacks any form of handleability. An increasing magnification factor also leads to additional head and eye movement which again slows down reading speed (Lueck et al. 2003).

The use of assistive technologies that do not change the actual object but magnify it in an optical or electronic way might thus be an alternative. As the information medium can be adapted to individual requirements with respect to its size, contrast, colour scheme etc., magnification using assistive technologies leads to more satisfying results than object magnification, especially with regard to text comprehension while reading (Farmer/Morse 2007).

4.2 Optical and electronic magnification

In the most basic case, magnification can be optically realised. For greater distances, everyday monoculars or binoculars can be used. Furthermore, there are tools which are either already integrated into spectacle frames or can manually be attached. For distances of less than one arm's length, appliances such as stand

magnifiers equipped with a holding mechanism in order to maintain stability, hand magnifiers or magnifying glasses can be used (Mulloy et al. 2014). Conventional magnification factors of such mechanical tools are between 6 and 10. Especially hand magnifiers and magnifying glasses can be used everywhere and in a rather discrete manner. Magnifying glasses allow, for instance, users to read an ordinary book on the beach. Nevertheless, screen magnification systems always bear the risk of inducing poor posture. These appliances also require constant training in order to correctly follow the lines or to ignore the information perceived via the second eye when using a monocular. Optical magnification is also limited by technology itself since the distance between the eye and the information medium is continuously diminished by an increasing magnification factor.

Electronic visual aids can be divided into the following categories: floor-mounted appliances, hand-held cameras and battery-powered mobile devices. With regard to floor-mounted appliances, the camera is, depending on the model, fixed 20 cm above an X-Y table in order to move the information medium and is positioned under a screen. In addition to allowing the reading of texts, these appliances are also suitable for activities such as colouring picture books, solving crossword puzzles or cutting finger nails. Hand-held cameras are usually connected to a notebook via a cable, can provide mobility to a limited degree and are appropriate for magnifying objects too large to fit under floor-mounted appliances, such as recipes printed on packaging, descriptions on vacuum cleaners, globes etc. Furthermore, hand-held cameras can be used to apply make-up, look at pimples or other skin anomalies or for wound care. Mobile devices generally have cameras directly integrated into the display housing, which is designed to show an image of the magnified object. Autonomous mobile electronic screen magnification systems have now become less important since they have been replaced by smartphones and tablet computers. Board reading systems connected to a device that can be controlled manually or, for example, using a joystick are an appropriate alternative for distances. Such systems are primarily used in class, seminar and conference rooms.

In this context, whiteboards represent an interesting new approach (Illinois State University 2012). The image produced by the interactive whiteboard is

transmitted in real time to a tablet computer via a wireless connection where it can be adapted to individual requirements through standardised functions and additional applications.

The limits of magnification in the context of electronic vision aids are primarily defined by how they need to be handled. An increasing magnification factor impedes orientation on the information medium as well as handling in general (in case of trembling, wobbling tables, fixation etc.) and the number of required hand, head and eye movement increases.

5 Specific assistive technologies in everyday life

The third section will present the technologies designed to combat specific challenges, particularly in the fields of orientation, mobility, life skills and leisure activities.

Some of these technologies – such as talking watches, talking kitchen and bathroom scales, talking colour recognition devices, self-contained read-out-loud systems (a voice output system linked to a scanner and able to read out loud the loaded sheet at the touch of a button) and note-taking devices – are still available as specially designed devices. All these devices have their relatively simple usability and high production costs due to low sales figures in common.

Most of them, however, have been replaced by free or affordable applications on smartphones or tablets by now. It is thus possible to revert to the previously described operating concepts (screen reader technology) and the application of input and output systems already available on devices. This again emphasises the fundamental significance of the screen reader technology for all visually impaired people, as specially designed devices apparently become less important.

While the applications that are available online and testable at any time are subject to further development and crowding-out processes, the associated challenges remain almost the same. This section is therefore restricted to the identification of the problem as well as corresponding conceptual solution approaches.

Numerous applications to foster mobility and orientation are available nowadays. They provide user interfaces for visually impaired people on the basis of conventional navigation systems. Haptic feedback is preferentially used here in order to not involve the auditory sensory channel needed for essential situational regulation (recognition of obstacles, mental visualisation of traffic, interaction with others etc.).

Another crucial area includes applications for text recognition; they contain features with which to photograph the information medium, ideally supported by other features that improve focus, recognise the contained text via software and read it out loud with the help of voice output. Such applications are especially advantageous for blind people if it is possible to localise where the respective text is displayed. This would be the case for restaurant menus or letters, whereas road signs could usually not be captured on account of the lacking option for localisation. People who are still capable of localising the shape of road signs despite their limited visual abilities, however, would rather use an optical or electronic screen magnification system (e.g., a smartphone feature to zoom content) to read the signs.

Furthermore, there is the category of question-and-answer applications (Q&A applications). In this approach, it is possible to photograph an object that cannot be visually determined and post it e.g. to a social media account for a group of volunteers. One of the volunteers then transcribes the visual information into a text message or answers questions (Which drug is this? What is the content of this tin? Is my new boyfriend handsome?). The recognition process within Q&A systems has been automatised in the meantime. In this context, applications to read QR codes or barcodes or to recognise colours might, especially when shopping (Is this tomato ripe?), also be beneficial. Nowadays, applications have become available that are configured to such an extent that volunteers can render assistance during video conferences which allows e.g., the retrieval of an apple that rolled away.

Applications are now also available, not just for visually impaired people, that can synchronise the audio track of a film in real time and then offer an audio track supplemented by an audio description via headphones. Moreover, a variety of accessible text-based role-playing games, games of skill such as auditory archery (the more centrally the arrowhead is aimed, the higher a

perceptible tone becomes), auditory ego-shooter games or quizzes are already on the market.

Aside from these specially developed applications, numerous accessible standardised applications, particularly in the fields of communication and social networks, have become highly popular among visually impaired people and are set to still increase in popularity in future.

6 Conclusion

The previous sections introduced a variety of assistive technologies for visually impaired people. On account of the concretely described handling of those technologies, diverse challenges have emerged that visually impaired people still have to face and cope with. These challenges include, for example, generally understandable communication at eye level, self-determined access to information and the use of standardised hard- and software and associated screen reader technology. Overcoming these challenges is essential for the success of societal participation. Nevertheless, the described approaches also show that a number of these challenges can also be overcome through the appropriate use of assistive technologies. The corresponding use therefore represents some of the most effective measures within the process of including people with disabilities (Michaels/McDermott 2003).

Despite this knowledge, numerous studies conclude that the potential of assistive technologies is not even close to being fully exploited (Wong/Cohen 2012). While the inhibiting factors of acquiring assistive technologies, namely high purchase prices and a lack of availability, have eased due to the use of standardised devices, there is still no extensive and systematic concept of how to learn to use these technologies.

Three concluding aspects must thus be considered in the context of this crowding-out process. On account of the rising trend regarding the use of standardised devices and the associated uniform user interfaces, the operating concepts converge towards screen reader technology, which can be interpreted as a positive development. The complexity level of such devices as well as of screen reader technology is significantly higher than that of many specifically

designed devices, which represent appropriate tools particularly for people with compounding starting conditions and additional impairments. Without useful alternatives, the situation of this very target group would deteriorate, since the specifically designed devices as well as the manufacturing companies might disappear due to decreasing sales figures. In terms of the actual trend, it must finally be critically discussed that people with disabilities become dependent on the societal self-conception of that communication and that it should be accessible. The promotion of participation by means of this type of accessible communication is thus not only an interesting technological challenge but also a sustainable and responsible task for society.

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Christiane Zehrer

Writing and translation tools for accessible communication

1 Introduction

Accessibility has become increasingly important since the adoption of the UN Convention on the Rights of Persons with Disabilities in 2008 and its ongoing implementation into national law. As a result, the number of documents that must be written in German Easy Language increased dramatically. At the same time, scientific interest in communicative barriers and how to avoid them was awakened, which has led to increasing requirements regarding the quality of accessible communication offers. This is where writing and translation tools come into play.

Writing and translation tools are used in technical communication to optimise functional texts such as operating instructions by means of unambiguous wording and consistent formulations. In the context of accessible communication, this functional principle, namely to selectively limit linguistic diversity, plays a central role as linguistic variance can confuse inexperienced recipients. This is remedied with the help of terminology databases in which comprehensible definitions can be stored and recalled; translation and text memory systems providing successful simplified formulations for reuse; and authoring tools that check the rules at the level of words, phrases and sentences and ideally provide targeted suggestions for accessible transformation. This article discusses the functionality and possible use of these tools for German Easy Language (and simplified varieties of other languages).

The article is based on the state of the art in February 2018. It includes an outlook on the development of tools based on so-called artificial intelligence (AI), or more precisely referred to as neural networks.

2 German Easy Language as a variety of accessible communication

> "German Easy Language is a variety […] of German that is systematically reduced in terms of syntax and vocabulary. A systematic reduction can also be seen with regard to global knowledge, which is a prerequisite for reading. […] In addition, German Easy Language texts are characterised by a special form of visual preparation" (Maaß 2015: 11–12; English translation of the German original).

This definition by Maaß includes all the essential features associated with the use of writing tools. Both the choice of vocabulary and the syntactic constructs are governed by certain rules that form a subset of the standard German rules, supplemented by a few specific standards, such as: the mediopoint ("•") (ibid. 12) or representation of numbers in the Arabic numeral system (ibid. 93–94). While this reduction can in principle be implemented with the aid of the various computer-aided tools, an appropriate handling of reduced world and prior knowledge (which requires an addition of the missing aspects) is currently beyond their capabilities.

Before this article dedicates itself to the challenges that an "easy" variety poses to text production and the aid provided by computer-based tools, I will first briefly address the link between accessibility and reduced variance in the sign inventory.

3 Special challenges in the production of accessible communication offers

Communication is not only a challenge for the recipient (which is supposed to be facilitated with German Easy Language), but also for the producers. The reason for these challenges are the restrictions listed above at all levels of the language system and the idiosyncrasy of the communication situation. In dealing with texts, the translators of EL texts and their addressees are at complete opposite ends of the spectrum: on the one hand, professional famil-

iarity with written material, different text types and discourses. On the other hand, German Easy Language as a necessity to understand any type of formal communication (see Bredel/Maaß 2016: 139).

The marked distance between the communication abilities of the recipients and the producers causes major difficulties for the latter group. Easy Language is by no means easy to produce. The consistent reduction of writing styles and expressions requires a great deal of concentration and sometimes also high levels of creativity.

Software can provide significant assistance here at the word and sentence levels, as the following sections will show. However, the current tools have a systematic limitation beyond the sentence or at the latest the paragraph level. What exactly writing and translation tools can achieve and how they can be used for German Easy Language is explained in the following sections.

4 Functional principles of writing and translation tools

In their current state, writing and translation tools are simply tools. They are therefore aids that assist qualified authors in their work. According to the taxonomy of Hutchins and Somers (1992: 148) this symbiosis can be referred to as machine-aided human translation or a correspondingly low level of automation of technical writing.

The individual tools operate at the level of different linguistic units: Terminology databases manage content items as well as different – permitted and undesirable – terms for these items. Translation and text memory systems operate on the basis of sentences or sentence segments. Authoring tools analyse different parameters of the language surface and then provide ideas for simplification (see Keller 2011, Arntz/Picht/Schmitz 2014: 232–233).

However, only humans can take the ultimate decision on the linguistic structure of a text. The tools therefore reduce cognitive load – the required attention resources. Ideally, these are then available for developing, retaining and reflecting on the truly creative components (see Hacker 1994: 85–86; Wickens/Carswell 2012: 134–135; Vidulich/Tsang 2012: 245, 263).

4.1 Terminology databases

Terminology databases (also: "terminology management systems" – "TMS") are the oldest and technically simplest form of writing tools (Arntz/Picht/Schmitz 2014: 221). Their functional principle is that they are term-based, i.e. they manage synonymous expressions on the level of meaning (Arntz/Picht/Schmitz 2014: 235–236). These expressions can consist of one or more words or can even be multi-word expressions, e.g. as is typical in Romance languages.

In practice, a common Easy Language translation strategy is to paraphrase or define difficult terms. This also applies to many standard phrases that are far from common for the typical recipients of German Easy Language texts. The definition, in turn, must generally fulfil the rules of German Easy Language and do justice to the requirements of the target group.

Let us look, for example, at a text on vocational training as a "Tailor in the women's and men's tailoring industry" (English translation of the German original term "Näher/in"). It states

> "If you want to become a tailor, you should have manual skills and a good imagination."
> (Landesbildungszentrum für Hörgeschädigte Hildesheim n.d. c; English translation of the German original)

Our translation team at the time came up with the solution:

> "As a tailor you have to have the following skills:
> You have to be able to work well with your hands.
> You have to be able to imagine things well."
> (Landesbildungszentrum für Hörgeschädigte Hildesheim 2013b; English translation of the German original)

At the time, this decision was made after a long group discussion – thus entails considerable creative effort. A terminology management tool now permanently preserves this translation.

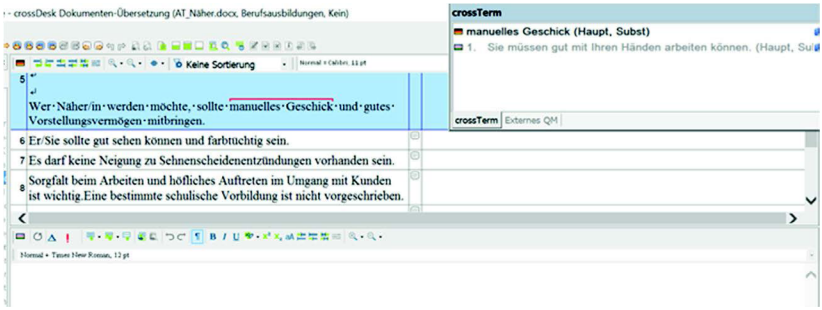

Figure 1: German original: Support through terminology management: retrieved expression (left) and paraphrase as a translation from the database (top right window) (Across 2014–2016)

The benefit is twofold: First, a translator can resort to a wealth of existing solutions as a project progresses. Second, consistency is ensured for the addressees: one expression, one identical statement in all relevant passages in the text. And if applicable, the translator can also deliberately forego repeating the same explanation over and over again. The TMS achieves its full potential in particular with different but similarly structured texts: Increasing efficiency and standardisation.

4.2 Translation memory

The central operating principle of translation memories (also called translation memory systems, TMS) is the recognition of entire sentences (and paragraphs, where applicable) in the source text. As a result, the tool then suggests the stored translation associated with the retrieved text segment.

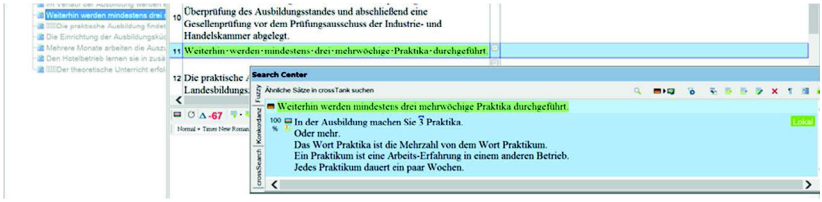

Figure 2: In the translation environment, a pre-translated text segment is highlighted in green and the existing translation solution is suggested. (Across 2014–2016)

A special feature of translation memories is that they can also recognize so-called "fuzzy matches", i.e. translation units that do not fully correspond to an already translated text fragment but only to 90, 80 or even 50 percent. For example, the following sentences from the online presentation of vocational training occupations are very similar:

Tailor	Painter and varnisher
If you want to become a tailor, you should have manual skills and a good imagination.	If you want to become a painter and varnisher, you should have manual skills and be physically resilient.

Figure 3: Two sentences with the same wording in the source text. (Landesbildungszentrum für Hörgeschädigte Hildesheim n.d. c, b; English translation of the German original)

If you set the threshold for matches in the translation memory low enough, the uniformity of the sentences in the source text will be recognized correctly.

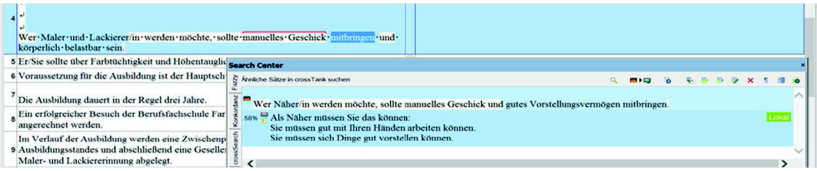

Figure 4: The translation environment displays a so-called "fuzzy match" with a 58% match. (Across 2014–2016)

This resulted in the following translation:

> "As a painter and varnisher, you must be able to do the following:
> You have to be able to work well with your hands.
> You have to be able to stand for a long time.
> You have to move a lot."
> (Landesbildungszentrum für Hörgeschädigte Hildesheim 2013a;
> English translation of the German original)

The advantage for translators is that they can refer back to a version that has been previously translated and possibly already undergone a quality assurance. At the same time, the variance of the used linguistic means is reduced. This, in turn, prevents the recipients from being overwhelmed by too much vocabulary and too many structures.

A prerequisite for the appropriate use of a translation memory for Easy Language is the assignment of the pairings from the source and target language according to units of meaning. This is difficult to implement automatically, since the information contained in a standard language sentence must, by definition, be divided into several main clauses in Easy Language.

Accordingly, the assignment of the combination standard language – Easy Language (the alignment) must almost always be performed manually. In some systems, this can also be done during the translation process. The following figure of a retrospective alignment shows the main obstacles.

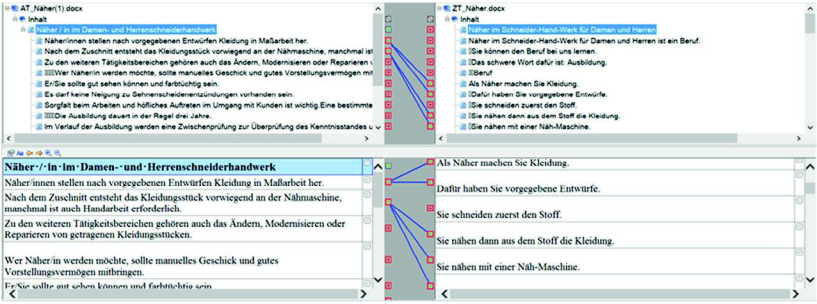

Figure 5: Main obstacles when using translation memories for Easy Language: Several sentences in Easy Language form a translation unit (bottom); Insertion of explanatory paragraphs without counterparts in the standard language text interface (top). (Across 2014–2016)

However, working with translation memories in Easy Language has limits when texts are too dissimilar. A solution that requires a slightly different approach is offered by text memories or authoring systems.

4.3 Text memory

Text memories use a similar principle as translation memories, but search for similarities in reference texts in the target language. For example, a translation memory will find no fuzzy matches for the following pairing.

Tailor	Cook
If you want to become a tailor, you should have manual skills and a good imagination.	If you want to become a cook, you should have manual skills and an interest in handling food.

Figure 6: No fuzzy match in the translation memory, solution using text memory. (Landesbildungszentrum für Hörgeschädigte Hildesheim n.d. c, a)

Text memories have further configuration options. The desired words can be searched for in the order entered, or all inflection forms of a sentence can be searched for (see fig.).

Figure 7: The text memory finds further inflection forms of a formulation (MindReader author support 2010)

Above all, the search in text memories usually has a higher tolerance for deviations. This is due to the respective implementation and is therefore not systematic. Combined with the fact that the target texts (should) have less variance, the result is a higher hit ratio.

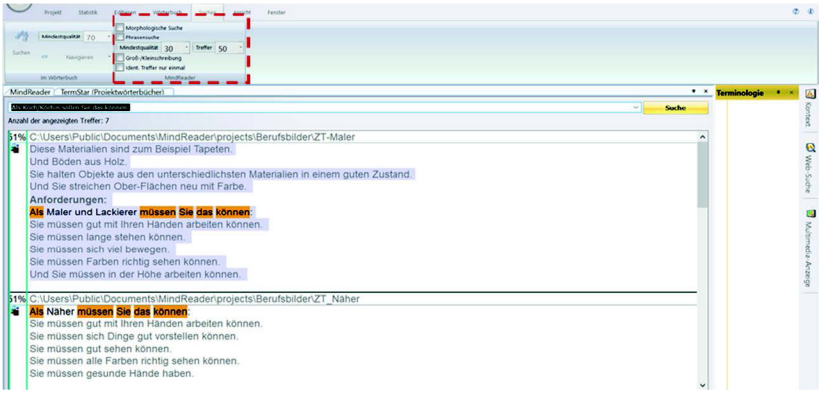

Figure 8: Search for similar segments in the text memory. The found equivalents show a concordance of 51% (see line on the far left). They could theoretically have as little as 30% (see menu bar). (MindReader author support 2010)

The difficulty in using text memories for Easy Language is that the author must at least start to formulate a target sentence in order to provide the system with input for its search. Both translation and text memories are based on reference material, which the author must independently obtain and enter into the system. The system support is largely based on a comparison with existing material (Villiger 2014: 234–235; see a. Bock 2014: 27–28). The path to the contextualisation solution is only indirectly indicated. To that end, an author of Easy Language texts can use rule-based authoring systems.

4.4 Authoring systems

Authoring systems examine the text currently under production for compliance with certain rules. Ideally, the system will then not only show which sentences, paragraphs or fragments do not comply with the rules of Easy Language, but also how they can be optimised.

Criteria are stored in the system on the basis of which the entered text is checked. A statistical or "flat" analysis of the linguistic material is generally distinguished from a "deep" one. The latter has more "knowledge" about e.g. part of speech, phrase complexity and syntax (Carstensen 2017: 13 and 41–43). Irrespective of the name, a flat analysis can help solve many Easy Language (and Natural Language Processing) problems (Johnson 2009).

The following figure shows the practical application of an authoring system. In a sidebar, it shows which individual categories of the respective text do not comply with the criteria of linguistic simplicity. By selecting all the relevant text passages with a mouse click, the translator can specifically amend the offending parts. In this process, e.g. long sentences will be divided into two sentences with full stops. Long words, abstract nouns and metaphors are replaced by shorter and more understandable ones. The authoring tool itself provides general and procedural information. There is also a readability index.

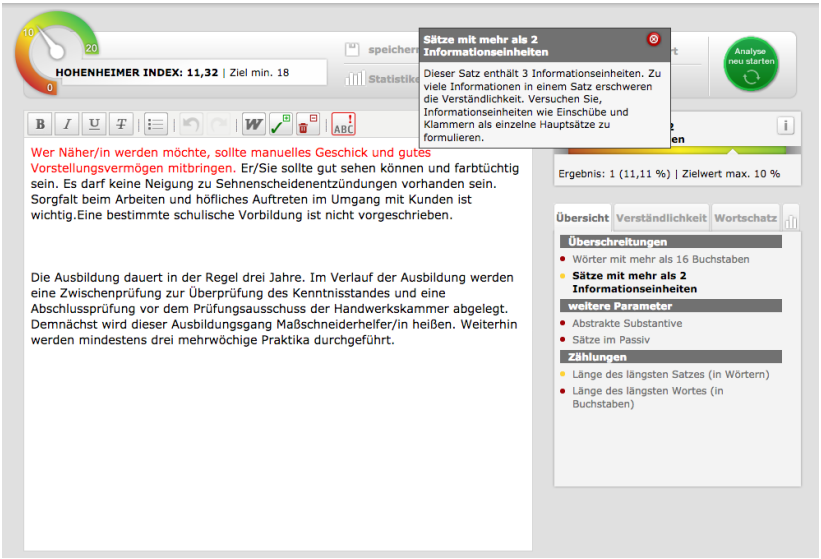

Figure 9: The authoring system indicates violations against the rules and provides tips for improvement. (Text-lab 2017)

Most tools additionally have their own terminology management system. Users can enter expressions that should be used in texts on a whitelist, i.e. preferred terms. In contrast, unwanted terms are collected on a blacklist. The advantage over standalone terminology solutions is the integration in the statistical analysis and the ease of use for inexperienced users. The disadvantage is that the system cannot be configured as extensively by the user as a dedicated TMS.

In order to transfer the phrasing solutions found with the help of the authoring system to other texts, these would have to be transferred to a text or translation memory. The combination of tools must therefore be specifically configured for the respective project environment in order to achieve optimal support. But even in combination, all solutions on the market (and probably translation into Easy Language in general) always exhibit the same difficulty: creating a coherent text from all optimised single sentences (Bredel/Maaß 2016: 488–489). A new generation of writing tools based on so-called "artificial intelligence" (AI) could help here, at least in the medium term.

5 Writing tools based on machine learning

On the 27th of September 2016, Google announced the transition of its translation service "Google translator" to so-called neuronal machine translation. As a result, the topic of (fully) automated translation returned to public awareness in one fell swoop (Google 2016). The company DeepL published its DeepL translator in 2018 (see DeepL GmbH n.d. a). The program translates between common European languages much more efficiently than previously used algorithms (DeepL GmbH n.d. b; Schwan 2017). However, there is currently no neural network that is explicitly devoted to Easy Language. The most demanding task when translating into Easy Language is to find suitable Easy Language implementations for complex issues. In order to "acquire" this ability, the neural network also requires large amounts of so-called training data. These are currently sentence pairs as we know them from conventional translation memories (DeepL GmbH n.d. b). For an explanation of how neural networks work as the basis for such tools, I refer to the article by Krüger (2017). The founder of DeepL attests, however, that his program has a "high understanding of the text", and the report speculates in the direction of actual understanding of content (Schwan 2017; English translation of the German original). This would be a prerequisite for overcoming the challenge that Easy Language poses beyond its paragraph boundary.

6 Conclusion and outlook

This article discusses current and future tools for creating texts in Easy Language. It is based on the peculiarities of this variety, which were presented elsewhere as a reduction in linguistic means and the necessary addition of world knowledge.

The result is sobering insofar as existing software tools perform some of the monotonous work (terminology management, translation and text storage) and can also provide help with the rewording quite precisely (authoring systems). However, this requires extensive preliminary work; the creative performance in using the available tools and in phrasing is highly demanding – and remains the responsibility of the user. The systems simply look up linguistic surface phenomena in large amounts of data. There is, however, hope that Al research will enable actual permeation of content. This would not only be an extremely useful application, but also a test for the algorithms: Do they actually recognise information? And can they then provide explanations in Easy Language?

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Nathalie Mälzer and Maria Wünsche

Accessibility and inclusion at the theatre: The Inclusive Theatre Project at the University of Hildesheim

1 Introduction

Documents in German that demand equality and participation for everyone in every aspect of political and cultural life often mention the terms accessibility ("Barrierefreiheit") and inclusion ("Inklusion") alongside each other. This is also the case in the Lower Saxony action plan "Inklusion. Für ein barrierefreies Niedersachsen" (see MS Nds. 2017). This document offers concrete measures to enhance access to information, entertainment and cultural events offered by public authorities, media institutions as well as educational and cultural institutions. This does not mean, however, that these terms can be used synonymously. Instead, they refer to two different approaches to disability and to normative effects in our society.

The question whether a theatre performance can be described as accessible or inclusive can be answered by looking at the audience at which the performance is primarily aimed. If a stage play is created primarily for a non-disabled audience and is made accessible for people with sensory impairments afterwards and only for a limited number of shows, we do not use the term inclusion. Instead, this would be described as an accessibility-approach. This article presents an inclusive approach to theatre performances and analyses the differences between the accessible and inclusive approaches using the example of the Hildesheim Inclusive Theatre Project. The project was launched in 2014 and addresses a heterogeneous audience. It aims at developing a form of theatre that does not hierarchize different target groups (in the case of this project, people who are D/deaf, hard-of-hearing, or hearing) but is instead accessible for all by offering different modes of action.

This article first provides definitions of the terms accessibility and inclusion (part 2). Part 3 addresses Deafness in the theatre context, part 4 examines the concept of co-translation from a translation studies perspective and in the context of the Inclusive Theatre Project. Three inclusive productions have been created in the project[1]. In part 5, the results of audience surveys of these three productions are presented. They also generate useful insights for the further development of the project.

2 Accessibility and inclusion in the theatre context

2.1 Accessibility at the theatre

Creating accessibility in the context of a theatre production means that communicative barriers are either circumvented or reduced. According to Jekat et al. (2014), these communicative barriers can be divided into four categories: 1) A person does not have sufficient knowledge of a language, 2) a person does not have sufficient prior knowledge to understand the contents of a message, 3) the wording of a message is too complex, 4) a person has limited or no access to the sensory channels via which the communication takes place (see Jekat et al. 2014: 7).

The research field of Accessible Communication is primarily concerned with barriers 3 and 4. In recent years, accessibility of digital or audio-visual information has been promoted in Germany. It has also gained importance in the field of education and cultural life, as demanded in Article 30 of the UN Convention on the Rights of Persons with Disabilities, particularly in subsections 1 and 2 (see UN CRPD 2008: 26 f.). This led to an awareness that cultural offers such as museum exhibitions or theatre performances need to be made accessible to different target groups and that disabled people need to be given equal opportunities to develop their creative potential. However, no specific laws have been passed to that end in Germany so far. Access provisions in these fields can often be traced back to the initiative and commitment of individu-

1 Since the publication of the Handbook in German, more inclusive performances have been created within the project.

als. There are various access tools available: audio description for people with visual impairments (see the article by Benecke in this volume) or sign language interpretation for people who are Deaf (see the article by Herrmann in this volume). These can be described as intersemiotic translations and are added to, or, to a certain extent, integrated in a performance at the end of its production process. Ugarte Chacón, however, doubts that these translations lead to new aesthetics (see Ugarte Chacón 2015: 41 and 306). We, however, question neither the effectiveness nor the importance of accessibility measures. They are indispensable for providing access to areas of cultural life that, according to the UN Convention on the Rights of Persons with Disabilities, to a large extent remain inaccessible. These measures therefore contribute to reducing discrimination. A condition for inclusive productions, however, is a critical reflection on societal structures and mainstream society and an awareness that the theatre world has been and still is shaped primarily by non-disabled people. This reflection is not necessarily needed for an accessibility approach.

2.2 Inclusion at the theatre

If the aim is to not only reduce communicative barriers but instead to foster equal participation in cultural life for everyone, existing theatre structures need to be reconsidered, and new, more inclusive ways need to be created and tested. In contrast to accessibility, it is important in both theory and practice that not only individual exclusion mechanisms are addressed and eliminated, but that social changes are initiated that make inclusion structurally possible (see Kronauer 2010: 17 f.). A central aspect here is that exclusion takes place *within* a society and not *from within it* (see Kronauer 2006: 29). Thus, there is a critical reflection in the inclusion discourse on normative mainstream society and marginalised groups (see Wünsche 2016: 195). Inclusive measures aim at recognizing diversity on a structural level. This cannot be achieved through individual measures alone. Structural changes must be initiated as well (see Bentele 2012: 15).

What does this mean for cultural institutions such as theatres? Inclusion does not mean providing access for people with sensory impairments to a play that has been written and produced for hearing and sighted people. It means developing productions that include people with sensory impairments in the

process and addressing all target groups equally. Currently, the target groups in the Inclusive Theatre Project are people who are D/deaf, hard-of-hearing and hearing.

3 Being D/deaf and hearing at the theatre

As has already been mentioned at various points in this volume, the target group of people who are hearing, hard-of-hearing and D/deaf is heterogeneous (see the articles by Hennies and Mälzer/Wünsche in this volume). Distinctions may be made following a medical approach (hearing status), a linguistic approach (German or German Sign Language), or a cultural approach (hearing or Deaf). According to Ugarte Chacón (2015: 37; English translation of the German original), many encounters between D/deaf and hearing people can be described as "precarious communication situations" because communication is restricted or impossible due to different communicative requirements. This project focuses on the cultural approach to Deafness.

Since the target group in the project is heterogeneous, reception may also vary significantly. In addition to individual differences, different communicative requirements and different primary languages need to be taken into account. It therefore remains important to reduce existing communicative barriers or to not create them in the first place. Rausch (2011: 65) defines four modes of communicative participation of people who are D/deaf and hard-of-hearing: spoken German, German Sign Language, written German and Signed German.

Signed German was not used in the project, but the other three verbal modes were used in different forms and with different functions. Surtitles (written German) were particularly important because they can be perceived by the entire target group. They may therefore function as a connecting element with the ability to reduce, at least a certain extent, communicative barriers.

If different modes of communication are used on stage for a heterogeneous target group, not every message might be understood by every person in the audience, whether hearing, hard-of-hearing, or D/deaf. Comprehension and incomprehension in this case therefore do not depend on hearing status, but

rather on language skills (spoken or sign language). The focus of the project is thus directed away from a deficit-oriented definition of D/deaf people as "hearing people who do not hear" (Ugarte Chacón 2015: 129; English translation of the German original) to cultural differences between hearing and Deaf people and their encounters on stage and in the audience. The project aims at creating equal possibilities of reception for every audience member in the knowledge that reception experience cannot be identical. The Inclusive Theatre Project also aims at establishing structural changes at the theatre according to the definition of inclusion (see Kronauer 2010: 17 f.) mentioned above. Theatre is still heavily shaped by hearing people and, according to Ugarte Chacón, often excludes D/deaf people: Deaf theatre in German Sign Language is often exclusively aimed at Deaf people. Hearing people's theatre is often exclusively aimed at hearing people, even if D/deaf actors appear on stage or if German Sign Language is used (see Ugarte Chacón 2015: 24). In this context, it is important to contribute to the demarginalization of German Sign Language and to recognise its status as an independent language. In theatre productions for hearing people, far too often, "German Sign Language is reduced to an aesthetic movement where semantic content is secondary" (ibid.; English translation of the German original). The combination and interplay of the three modes in inclusive productions – spoken language, written language and sign language – will be investigated further in the following part.

4 Theatre translation and inclusion

In inclusive productions, translation processes fulfil various conditions and functions. It is particularly important to establish and agree on an organisational and legal framework for co-translation (see Mälzer 2016: 218 ff.; 2017: 184 f.; Mälzer/Wünsche 2018: 41). The translation needs to be included in the creation process of the production instead of being added to the already finished production. It is only under this condition that surtitles in connection with a sign language and a spoken language can achieve an aesthetic function, in addition to their communicative function. For inclusive productions, it is also important to de-hierarchize the communication modes used on stage:

Spoken language (SpL), written language (WL) and Sign Language (SL). This means, there need to be more translation directions than those commonly used in performances that are made accessible ex-post, i.e., SpL → SL or SpL → WL (surtitles).

4.1 The translatory-communicative function of theatre translation

In an inclusive production, surtitles may be the common denominator to ensure comprehension. However, they are not only aimed at D/deaf and hard-of-hearing audience members, as is the case with SDH (see the article by Mälzer/Wünsche in this volume). Within an inclusive and multilingual theatre production, which is aimed at different target groups in equal measure and which for this purpose uses different translation directions, surtitles are only one of many modes. Surtitles are used to translate spoken language (SpL) to written language (WL). In addition, they can be used to translate sign language (SL) to written language. Beyond that, it is also possible to translate from spoken language to sign language. Those translation directions are also reversible. Hence, the following translation concept can be developed (see Mälzer 2017: 187; Mälzer/Wünsche 2018: 50):

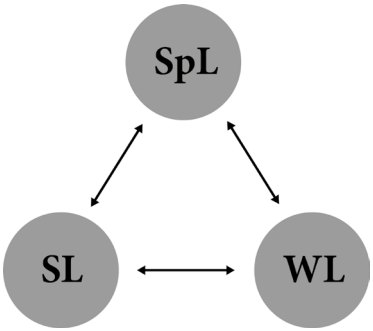

Figure 1: Modes and translation directions in an inclusive production

When communication modes and translation directions are de-hierarchized, audience members may find themselves in situations where they do not understand and/or may experience the feeling of being dependent on translation.

This raises awareness of barriers that exist for oneself and for others without validating common hierarchies of languages and communication modes in our society, i.e., without giving preference to the spoken language.

4.2 The aesthetic dimension of surtitling

Another important aspect of the Inclusive Theatre Project is the aesthetic potential of theatre surtitles. Instead of being used as a paratext (Genette 1982) in performances that are made accessible ex-post i.e., as an add-on to the original text, surtitles in inclusive productions are a part of the theatrical signs (see Mälzer/Wünsche 2018: 45 ff.). Following comic research that investigates the expressiveness of lettering (Schüwer 2002: 209, De Assis 2015), the aesthetic potential of the written word on stage is explored and used to convey, e.g., prosodic and paraverbal information. This form of surtitling is also similar to Performance Writing, which Allsop defines as follows: "It is a frame through which a range of sonic, visual, graphic and movement performance are brought into view – the textualities of sonic, graphic and movement performance; the performance of sonic, graphic and movement texts" (Allsop 1999: 77). From this perspective, both the materiality of writing and its expressive possibilities – further enhanced by technology in terms of movement and temporality – thus become relevant.

It has been highlighted by several translation studies scholars that the translatorial-communicative function and the aesthetic dimension of surtitles are not mutually exclusive.

Foerster (2010: 83) for example rejects the notion of the inconspicuousness, of subtitles, which has been continuously postulated (see i.a. Becquemont 1996) and which is implemented in the current practice of surtitling (see Griesel 2000: 28). Griesel rightly questions this "inconspicuousness maxim" (2016: 338; English translation of the German original), and McClarty (2012: 138 f.) argues in favour of a creative use of subtitles, which can only be put into practice by using an interdisciplinary approach. Theatre is particularly suited for this since, compared to film, there are more options in terms of design and projection space for surtitles (Mälzer/Wünsche 2018: 47). Surtitles can be used, e.g., as a character or prop or as an essential part of the set design.

4.3 Co-translation as a prerequisite for inclusive productions

To make full use of the aesthetic dimension of surtitles and to de-hierarchize communication modes, translation processes need to be part of the production. It is not sufficient to ask translators to create surtitles shortly before the premiere, as is customary in traditional forms of surtitling of foreign-language theatre productions. Instead, the translator needs to be kept up to date during the creation of the production, from its conception to the rehearsal process, thus taking on an advisory role, translating and participating on a creative level. Therefore, instead of speaking of translation, we suggest the term co-translation (see Mälzer 2016: 218) which refers to the co-production in which director and translator take on different tasks but ideally closely coordinate their work with each other. The success of this translation concept depends on the translator's experience in intralingual-intersemiotic translation and their knowledge of and exchange with representatives of the target group(s). This exchange can take place by including the target groups in the production process and/or by conducting reception studies in connection to the performances.

5 Reception of inclusive plays

We have already mentioned that the reception of a performance may vary within a heterogeneous audience, which is why it is important to collect feedback from the audience.

The reception study throughout the project therefore aimed at finding out whether the translation concept mentioned above is accepted by D/deaf, hard-of-hearing and hearing audience members and how it contributes to the understanding of the play. It was especially important to gain feedback on how the integration of different communication modes and translation forms on stage are received by the audience, on whether the performances were comprehensible and on where there was potential for optimisation. The surveys included questions about personal information such as age, primary language(s), hearing status and frequency of theatre visits, but also about comprehension of the performance, legibility, and speaker identification, i.e., whether the surtitles could easily be assigned to the speaking or signing actors.

Questionnaires were used for the studies that were handed out to the audience members after the performances and were usually completed on site.

5.1 The productions

The first production that was created within the Inclusive Theatre Project, Club der Dickköpfe und Besserwisser (Club of the pig-headed and know-it-alls) was developed by the theatre collective Klub Kirschrot in collaboration with a team of translators from the University of Hildesheim at Theaterhaus Hildesheim. It was produced in 2014/2015 and premiered in February 2015. Following the co-translation approach, surtitlers developed the content and form of the surtitles together with the collective. Furthermore, subtitles were provided for videos filmed by the group and projected during the performance.

The second production, von außen zu nah (too close from the outside) by BwieZack, was created in 2016, also following the co-translation approach at Theaterhaus Hildesheim. It premiered in June 2016. During the performance, audience members were asked to change seats multiple times and sometimes sat in the audience, sometimes on stage. In addition, there were interactive moments between audience members and performers. These two elements were a surtitling challenge that was met by using both a stationary projector and mobile projectors. The latter could be moved freely by the performers on stage. Furthermore, some of the surtitles were typed live and combinations of surtitles were projected to illustrate the writing process of the main character and to capture the interaction between the performers and the audience.

In both productions all the performers on stage were hearing. Parts where German Sign Language was used were rehearsed with the support of D/deaf or sign language-competent lecturers and sign-language teachers.

The third play was *Mädchen wie die*, based on Evan Placey's *Girls like that*, directed by Wera Mahne, which premiered in January 2018 at Junges Schauspiel Hannover. For this production, the co-translation approach was not used in the sense described above, because translators primarily had an advisory capacity. Nonetheless, it was interesting to collect feedback from the audience on the interplay between German Sign Language, spoken German and written German in the form of surtitles and additional video projections.

5.2 Audience feedback: Recommendations for inclusive theatre projects

The results of the surveys on the three performances underline that so far, the project has been successfully achieving its objective of using translation not only as an access service, but also as an aesthetical means in theatre productions. There was, however, some criticism from the audience that should be taken into account in future inclusive productions.

5.2.1 Positive aspects

The feedback on all three productions was generally positive. Participants from all three studies highlighted the innovative character of the productions. The following aspects were positively received: the interplay between the different communication modes on stage (SpL, SL, WL), the creative surtitling integrated in the stage design, the use and visualisation of German Sign Language. In conclusion, the aesthetic dimension of translation was well-received by the audience in all the productions. Regarding the translatorial-communicative function, the first two productions were met with positive reactions, especially among D/deaf and hard-of-hearing audience members. Since at least two communication modes were used at all times on stage at all times, they considered comprehension of the performances to be ensured. There was less feedback on this aspect for the third production. This was due to the fact that surtitles in this performance were only used aesthetically and less to ensure comprehension for all target groups.

5.2.2 Optimisation potentials

Results from the first and third survey suggest that the use of loud music and noises can be perceived as disturbing. This needs to be considered in the conceptualisation phase of a production. Especially for users of hearing aids, which amplify acoustic information, sudden loud noises on stage can be unpleasant or even painful. The amplification of basslines, a partial and intersemiotic translation of music, however, was met with positive feedback. The amplification resulted in vibrations of the wooden floor in the audience. The bassline could therefore be haptically experienced by D/deaf and hard-of-hearing audience members.

Results for the second production suggested that the use of aggressive vocabulary in the surtitles was occasionally met with negative feedback. There was no negative feedback concerning the use of language for the third production although it used a far greater number of vulgar expressions. They were, however, only used in spoken German and German Sign Language, not in the surtitles. In addition, the audience at which this production was aimed was slightly older than in the first two productions. This raises the question of the different effects of spoken, signed and written language. Although the latter has already been investigated in-depth for the subtitling of films (see Gottlieb 2002: 191 f.; Ivarsson/Carroll 1998: 126 f.), further research in the context of theatre and for children and adolescents as target groups is needed.

Different recommendations for future productions can be drawn from the feedback on the legibility of the surtitles: An important issue particularly for younger target groups is the overall text volume of the surtitles. This applies to each surtitle individually but also to the surtitles as a whole. Overstraining the audience members must be avoided. It also needs to be considered that reading might not be popular among all audience members. The display duration of the surtitles during a performance therefore needs to be appropriate. Research on display times for different audiences is still needed, however.

Surtitles should be easy to read from all seats in the venue. Special attention is needed for productions in which surtitles are projected to different positions on stage. This aspect also needs to be considered if surtitles are projected with mobile projectors.

6 Potentials for further developments and related research questions

In the years to come, the project will have to address a variety of questions. The co translation approach has so far been used for performances for children and adolescents. It needs to be investigated whether the approach will also be met with acceptance by an older audience.

Furthermore, it would be insightful to use the approach not only for new productions but also for already existing scripts. In this way it could be analysed

whether classical dramatic texts (written for a hearing audience) are suitable for inclusive productions and whether or how this would influence the collaboration between translators and directors in the context of co-translation.[2]

In the context of this inclusive approach, there is also a need for research regarding the rehearsal process. It needs to be investigated how a collective rehearsal process with hearing, hard-of-hearing and D/deaf actors influences the work. Recommendations for an inclusive rehearsal process may be developed by filming rehearsals and interviewing everyone involved in the production.

It would also be interesting to find out how the translation might change if it is not only used to provide access to the play for audience members but also to address communicative barriers between the actors or the characters on stage and consequently make the audience aware that they know more than the characters. The surtitles may also require adaptation if they need to not only ensure communication between audience and performers by translating from SpL and SL to WL, but also to show the miscommunication between the characters.

As different dramatic texts use different styles of speech and speeds, further research is also needed regarding strategies of text reduction and the use of non-contemporary language.

Further accessibility tools may also be investigated for the Inclusive Theatre Project. To provide access not only linguistically but also with regard to content, video introductions might be useful. Like audio introductions for people who are blind or visually impaired (see the article by Mälzer/Wünsche in this volume), they could facilitate the reception of a performance for D/deaf, hard-of-hearing and hearing audience members.

2 Since the publication of the Handbook in German, this has been realized with the production "WOY", which is based on Georg Büchner's Woyzeck (Mälzer forthcoming: "Inklusive Ansätze in der ästhetischen Kommunikation: Reflexionen zum Hildesheimer Lehr- und Forschungsprojekt ThInk". In: *Zeitschrift für Sozialmangement/Journal of Social Management: Inklusion – Anspruch und Realität in ästhetisch-künstlerischen Handlungsfeldern*, 2/2022).

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Swenja Schum

Museum texts – On breaking down linguistic barriers in museums and art exhibitions

1 Introduction

A museum is a world of texts. At first glance, the objects on display seem to be at the centre of attention, and even linguistic records such as books and historical documents are initially presented as exhibits. However, the texts related to those exhibits quickly take over control of guiding our thoughts, our perception and the interpretation of what we see. As institutions that communicate knowledge and culture, but also as places that enable aesthetic, ethical and empathetic experiences, it is difficult to imagine museums without texts, i.e. without verbal communication.

This does not, however, refer only to the texts that are actually present in the exhibitions. In 1966, based on extensive visitor surveys, Pierre Bourdieu examined the social character of European art museums (Bourdieu/Darbel 2006). His findings suggested that even the absence of text could cause these museums to open and close themselves off to their visitors, silently expecting the audience to naturally have an own understanding of the artworks, an own aesthetic experience and a pre-existing "love of art" (Bourdieu/Darbel 2006: 13 ff.; English translation of the German original). The researchers also described that many visitors experienced a "feeling of unease", and that many ascribed a "sacred atmosphere" to the exhibition (Bourdieu/Darbel 2006: 85; English translation of the German original).

Thus, in discussing accessible communication, texts in a museum seem to be a double-edged sword: On the one hand, in trying to meet and offset educational privileges, they are already part of a modern form of social accessibility that is achieved to varying degrees. On the other hand, as texts, they constitute barriers themselves – by being difficult to identify, difficult to read

and difficult to understand. First studies demonstrate that visitors with special needs feel excluded from museums (Rehm 2017; example of the feeling of exclusion in adolescents with special educational needs in Hohlmaier 2015). National and international legal measures that aim at creating equal opportunities for people with disabilities caused further pressure on museums to actively become as accessible as possible. However, apart from a few rules aimed at avoiding architectural barriers that must always be respected, actions and efforts towards improved accessibility remained mostly project-based, especially since such efforts often needed to be financed through additional fundraising activities.

In light of this situation, this article seeks to provide an overview of texts and linguistic barriers in museum spaces and art exhibitions. Furthermore, it presents approaches and concepts to reduce these linguistic barriers that have emerged over the last years.

The article is divided into two parts. The first part (chapter 2) develops a comprehensive framework of the notion of "text" in a museum: It will be shown that the perception of various textual fragments is an integral part of visiting an exhibition or a museum space, and that those textual fragments can place several kinds of communicative obstacles in the way of its visitors. The analysis of the different textual fragments in museums may then help to show where (and how) concepts to reduce communicative barriers must be applied in order to systematically break down such barriers. The systematic presentation of different ideas and approaches towards improved accessibility in museum texts is the focus of the second part of this article (chapter 3).

Opening a museum to a larger audience is in the institution's own best interest: In the context of diverse public austerity efforts, budgets are contested and visitor numbers are valid arguments. Furthermore, many museums and other cultural institutions see themselves as public actors who aim at using their work to contribute to public discourse. All of these tasks and activities require the conscious use of different forms of text in order to open the door to visitors on a linguistic level as well.

2 Museum tours as an interplay of different subtexts

In order to understand where and how a visit to a museum can place communicative obstacles in the way of impaired visitors, it is useful to first provide an overview of the different kinds of texts visitors are confronted with before, during and after their museum tour. When, where and in which forms will visitors find texts that convey information, and that are thus meant to contribute to the exhibition's overall meaning?

For the purpose of systematization, the text model proposed by Genette (1987/2014) will be used at this point. Genette examines literary works and notes that a literary text is always flanked by different *paratexts*. With the term *paratexts* he refers to "all those accompanying texts that travel with a literary work on its way through the public sphere" (Weinrich 2014: 7; English translation of the German original). Genette himself describes them as follows:

> "[A] text is rarely presented in an unadorned state, unreinforced and unaccompanied by a certain number of verbal or other productions, such as an author's name, a title, a preface, illustrations. And although we do not always know whether these productions are to be regarded as belonging to the text, in any case they surround it and extend it, precisely in order to present it, in the usual sense of this verb but also in the strongest sense: to make present, to ensure the text's presence in the world, its 'reception' and consumption […]." (Genette 1987/2014: 9. Translated by Jane E. Lewin in *Paratexts: Thresholds of Interpretation*. 1997: 1.)

Genette further divides paratexts into *peritexts* and *epitexts*. He describes *peritexts* as subtexts that are located in the immediate vicinity of the main text and have a spatial link to it (such as the title or the preface, chapter headings or notes; Genette 1987/2014: 12). *Epitexts*, to him, are texts that still exist in the same environment as the main text and discuss and present it. However, epitexts have no spatial and temporal link to the main text (Genette uses broadcasted interviews and discussions as an example; Genette 1987/2014: 12).

Just like literary artworks, exhibits in a museum are flanked by various paratexts as well. In museums, too, exhibits are accompanied by various explanatory texts that make the artworks present and facilitate their reception. These texts can appear in many different forms: On the one hand, the exhibits are accompanied by *written* text (on plates and signs, displays etc.) in their immediate vicinity. Further written texts are available in the form of brochures and catalogues that accompany an exhibition. In addition, flyers or a museum's online presence prepare visitors for their tour. On the other hand, the exhibits are flanked by *spoken* text: Guided tours or audio guides convey knowledge and background information to the visitors, aiming at supporting and reinforcing the understanding of the visible elements of the exhibition. Spoken text can also include presentations, panel discussions or interviews with artists and/or curators explaining the concept of an exhibition or a museum. Furthermore, educational programmes such as workshops etc. are relevant. Using Genette's classification, the different subtexts in a museum can be systemized as follows:

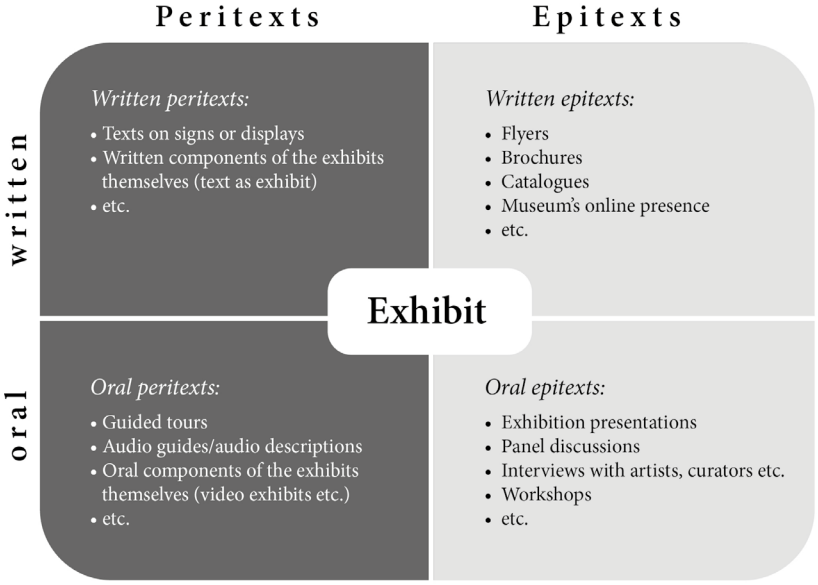

Figure 1: Paratexts (flanking texts) in a museum

The transfer of Genette's concept to museum spaces shows that artworks and exhibits in museums and art galleries are flanked by various texts. These texts can be realized in written and/or spoken form and are received through different sensory channels that together construct the individual cultural experience. The presentation and perception of the exhibits is strongly dependent on other design elements of the museum space (see, for example, the importance of lighting design in creating structure, experience and atmosphere as described by Bertron/Schwarz/Frey 2006: 90). However, this article only focuses on *linguistically* conveyed information in its written or spoken form.

The following second part of the article aims at bringing together specific concepts and approaches to reducing linguistic barriers in museum and exhibition texts. Like the rest of the article, the collection will be theory-based, compiling the results and findings of surveys and studies related to the reduction of communicative barriers carried out over the past years.

3 Approaches to breaking down communicative barriers in museums

In 2018, when this volume was originally published, academic research on the subject of breaking down language barriers in exhibitions and museums was far from extensive. References to communicative barriers in museums and proposals regarding their removal could mainly be found in individual project reports (cf. example in Al Masri-Gutternig/Reitstätter 2017; Siegert 2017). With the purpose of presenting a systematic overview of different concepts, approaches and best practices, I will apply the framework of Genette's model of subtexts modified in the first part of this contribution.

Increasing the accessibility of written peritexts

The term "written peritext" refers to any written text in an exhibition that is located in the immediate vicinity of the exhibit (e.g. explanatory plates and signs next to the exhibits, displays etc.). These texts may present a challenge to visitors with special communicative needs if those visitors, for various reasons, have problems interpreting and understanding texts in standard or expert lan-

guage. One approach to breaking down such communicative barriers is to present written information in a linguistic form with reduced complexity, e.g. in Easy-to-Read or Plain Language. This approach has been implemented and tested in several exhibitions and museums over the last years (e.g. in the Salzburg Museum or in the German Maritime Museum in Bremerhaven, see Al Masri-Gutternig/Reitstätter 2017 or Siegert 2017 respectively). Siegert emphasises that translations into Easy-to-Read Language should not be an "additive, but an integral part of an exhibition's concept", as acceptance of this form of text could otherwise be compromised (Siegert 2017: 485; English translation of the German original). Mälzer and Wünsche further elaborate on this idea and note that only an aesthetic consideration of accessibility services can create truly inclusive moments (see Mälzer/Wünsche's contribution on inclusive theatre in this volume).

If written text is mounted on a wall or permanently installed in any other way, then functional positioning, good illumination without glaring and/or reflecting effects, clear contrasts and an appropriate font size are all relevant (especially for people with visual impairments; RNIB 2003: 64). For this particular audience, written peritexts can also be translated into Braille. It is important to note, however, that only a relatively small group of people with complete or severe vision loss can read Braille. Therefore, an additional auditory presentation of the textual contents is crucial in ensuring the participation of all visually impaired visitors.

Increasing the accessibility of oral peritexts

Exhibits in a museum space are not only surrounded by written peritexts, but also by various oral texts: Information about the museum and the exhibits is provided in the course of guided tours or in audio guides, which are particularly excluding for deaf visitors or visitors with hearing impairments since they cannot perceive spoken language or can only perceive it to a very limited extent due to their sensory impairments. For this reason, many museums offer guided tours in sign language. Some museums and cultural institutions have broadened their range of guided tours for people with special communicative needs by offering tours in Easy and/or Plain Language. Here, it must be noted that the concept of Easy Language was originally conceived as a concept for written language, given

that a comprehensive implementation of its complex rules on the lexical, syntactic and textual level requires a certain amount of time and planning (Maaß 2015: 12). In light of this, a spontaneous oral production of rule-conforming Easy Language text seems difficult to achieve (Bredel/Maaß 2016: 29). However, since the spoken text in guided museum tours is often carefully planned and rehearsed, scripted even, applying the concept to orally presented subtexts in a museum does not appear to be entirely impossible. The question as to whether a strict implementation of complexity-reducing rules in the particular circumstances of face-to-face communication is necessary and constructive still remains debatable, bearing in mind that those situations characteristically require more flexibility and spontaneous adaptation to the present audience.

Another large group of oral peritexts consists of all forms of audio guides and audio tours. Audio guides are "acoustic guided tours, often implemented in museums and exhibition spaces, that are played back on special portable devices and can usually be received via headphones" (Popp 2013: 40; English translation of the German original). Eggert states that audio guides are a "hybrid form" of personal and media-based conveyance "because the communicative situation of a guided tour is simulated and modified by this device" (Eggert 2010: 13; English translation of the German original). However, the mere availability of a text in an auditive form does not make it accessible per se (RNIB 2003: 35): The (technical) format of an audio guide, which is used by all groups of visitors, must be differentiated from special *audio descriptions* for visitors with complete or severe loss of vision. Audio descriptions can be a *part* of an audio guide text as they provide a guiding description of visible elements. This description, however, should be kept as neutral as possible in order to not give too many interpretational instructions especially for blind and visually impaired audiences ("There are, though, dangers in providing recorded information which over-interprets a work – telling people how to look rather than what the work is. A delicate balance has to be struck." RNIB 2003: 39).

Detailed information and instructions on guided tours and audio guides for blind and visually impaired visitors can – for example – be found in the RNIB's *Talking Images Guide* quoted in this article; this guide also discusses several models of sensory tours with complementary material for tactile exploration (RNIB 2003: 28 ff.).

In order to create inclusive experiences for a diverse audience with different communicative skills and requirements, several innovative concepts for audio guides that combine various forms of conveying information (audio description, sound effects, music etc.) have been developed over the last years. Neves describes how such "enriched" audio guides can enhance the sensory experience of all visitors, stimulate their curiosity and imagination, thus inviting them to partake in a physical and cognitive exploration of the exhibition's content:

> "[We] understand Enriched Descriptive Guides to be (audio) guides, in which factual information has been 'enriched' through the creative use of description, sound effects and music, to provide thinking prompts that fuel the senses, invite cognitive and/or physical exploration, and capture the uniqueness of the cultural context the guide relates to. Unlike sound painting and descriptive guides that are primarily directed towards blind users, EDGs take all users into account in the belief that this approach will make culture accessible to people of any age, cultural background and personal profile. When combined with other forms of interpretative mediation strategies, EDGs will contribute towards holistic augmented experiences that trigger the imagination, stimulate the acquisition of knowledge and the desire to explore the exhibit or cultural environment through personal and social interaction." (Neves 2016: 55)

The fact that many museum visitors usually have smartphones on them, has, over the last years, inspired several larger museums and art galleries to develop their own apps. Those apps guide visitors through the exhibition spaces and are available as free downloads (Jankowska et al. 2017: 114). A project from Poland shows that such apps installed on visitors' mobile devices also hold the potential to reduce linguistic barriers: Three important art museums (the National Museum in Warsaw, the National Museum in Krakow and the Museum of Contemporary Art in Krakow) tested an app called *Open Art*, offering descriptions of selected artworks in the form of short video clips (Jankowska et al. 2017: 115). These video clips are composed of different kinds of visual material (e.g. photographs, short videos, artists' portraits and images of archived

material) and are complemented by narrative text in one of two available languages (Polish and English; Jankowska et al. 2017: 115). In addition, visitors can choose to display subtitles of the spoken content (in Polish or English) and its translation into (Polish) sign language.

In a small pilot study with both blind and sighted, deaf and hearing visitors, Jankowska et al. were able to show that all groups of participants considered the video clips helpful and mainly positive in regard to their length, their content, the content's realization and in regard to their complexity (Jankowska et al. 2017: 122 ff.). The app's usability was also rated positively (Jankowska et al. 2017: 128 f.); one blind participant emphasised that they preferred to use their personal device rather than the usual audio guides, given that it is easier to navigate one's own device and there is no need to adjust to a new gadget (Jankowska et al. 2017: 126). However, in order to confirm whether customisable smartphone apps akin to *Open Art* will be able to present a practical alternative to conventional audio guide solutions, these findings need to be confirmed in larger-scale studies of a similar kind. In addition to the user's perspective, the effort required for the production and technical implementation of the content as well as the adaptation of museum spaces to new (technical) formats need to be considered.

Increasing the accessibility of written epitexts

In addition to the discussed peritexts that flank the exhibits in their immediate vicinity, visitors also receive various texts outside of the actual exhibition space that still contribute to the overall experience of their museum tour. Such *epitexts* have no spatial or temporal connection to the exhibits and serve, for example, to prepare the visitors for their museum tour, by providing important organisational information or by giving a first glimpse of what can be seen at the museum.

One group of written epitexts that visitors might turn to before or after their museum tour comprises flyers, brochures and other forms of information and advertising material. According to Föhl (2007: 180), such marketing activities must be taken into account in striving for more accessibility. Flyers and brochures can be published in a complexity-reduced version (in addition to the original version). Here, flyers and brochures that unite the

standard language text and its intralingual translation (in a kind of bilingual brochure) might be a good option because they counteract the stigmatisation of an audience that is reliant on text in simplified language. Föhl (2007: 180) also emphasises that different target groups "have very specific habits of sharing or receiving information" – for example, according to him, people with hearing impairments often communicate via text message, while visually impaired people have special requirements for printed material (Föhl 2007: 180; English translation of the German original). He concludes that both marketing activities and marketing material need to be modified for different audiences: "Otherwise, we run the risk of offering 'accessible' products that are not used because the targeted audience is not reached at all" (Föhl 2007: 180; English translation of the German original; cf. also the contribution on media barriers by Rink in this volume).

If we think of other special audiences like researchers with particular academic interests, the group of written epitexts also has to include academic catalogues on collections and exhibitions. With a view to reducing barriers, the first question that can be asked here is whether these texts are (also) intended to address a broader audience and the public outside of the museum's internal and research community; if not, those text categories are subject to the specific communicative needs of the respective expert audience (that might, of course, include people with various sensory impairments).

In discussing written epitext, the museum's online presence and an accessible web-interface design are also highly relevant: For most visitors, the museum tour already begins at home (planning the tour, planning how to get to the museum, looking at entrance fees and getting a first impression). Should the information on the museum's web page not be presented in an accessible form, visitors may decide to not visit at all; therefore, an exclusion from the museum space may already have its roots in the sphere of online epitexts. To counteract such an exclusion, "accessible information on the internet can be displayed in larger fonts, be read out by synthesised voice output, be made accessible on any web-enabled device, or be offered in various multimedia forms" (Hellbusch 2007: 205; English translation of the German original; for specific requirements and guidelines for accessible web design, see the articles by Lang, Hellbusch, Womser-Hacker and Schütt in this volume).

The RNIB highlights the fact that accessible online information has a great deal of potential particularly for blind people and people with visual impairments: Beyond the level of pure information, it is possible to provide additional material (including audio documents) and special educational offers on the internet that can be received by blind and visually impaired people with the help of the screen reading software they have installed on their personal devices (RNIB 2003: 35). For instance, the New York *Museum of Modern Art* (MoMA) provides numerous audio documents and audio descriptions for various artworks on its internet pages; these documents are tailored to the needs of diverse audiences (some to audiences with special needs, such as blind or visually impaired visitors or children; however, some audio documents also contain interviews with artists or curators and therefore are of interest to all visitors). The potential of an accessible online presence in facilitating individual preparation and follow-up activities and in supporting audience-specific learning processes does not yet appear to be fully explored.

Increasing the accessibility of oral epitexts

The last group of subtexts to be discussed in this article's section is the group of oral epitexts – i.e. spoken texts that are not found in an exhibit's immediate vicinity, but which surround the exhibition in a larger context. Oral epitexts include presentations, interviews with and introductions by artists and/or curators, panel discussions, but also other educational programmes like workshops.

In order to make live events more accessible and, e.g., allow people with hearing impairments to participate, spoken contributions can be complemented by a live interpretation into sign language. Additionally, it is possible to offer a speech-to-text interpretation of such contributions (see Witzel's article in this volume). Workshops usually target specific audiences and are designed accordingly; here, it needs to be noted that programmes designed for very specific, segregated groups of people may not fully do justice to the concept of inclusivity.

The following figure provides a summary of the approaches and concepts addressing linguistic barriers in museums and art exhibitions that have been discussed in this section.

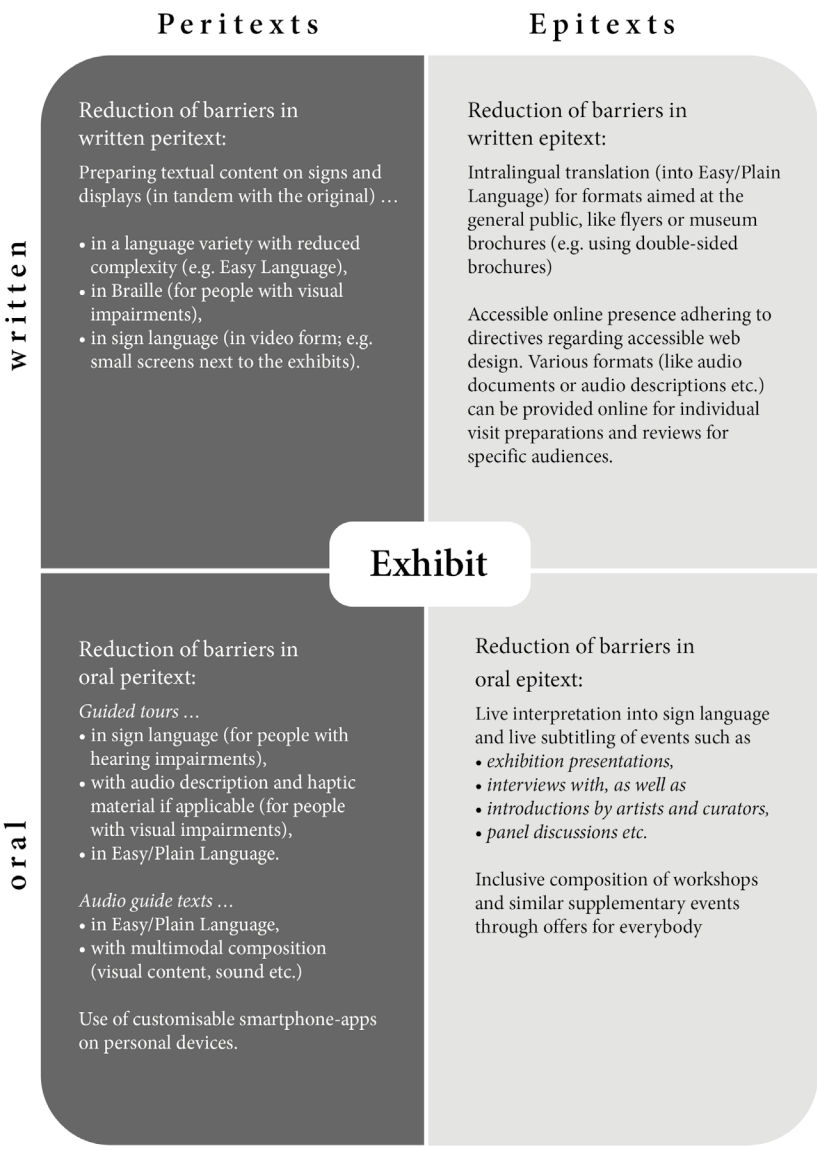

Figure 2: Overview of options for reducing communicative barriers in museums

4 Conclusion and outlook

The purpose of this article was to provide a systematic overview of the different subtexts visitors encounter in the course of a museum tour, as well as a systematic overview of approaches and strategies aimed at breaking down linguistic barriers in those subtexts. Considering the multitude of possible and necessary forms of (not only linguistic) support for different groups of visitors, it becomes apparent that preparing information for individual, separate target groups can – to a certain extent – be contradictory to the idea of inclusion: If each target group is presented with its "own" set of information in a way that is specifically tailored to them, there will be no *shared* experience. The museum's various activities, which are generally addressed to society as a whole, would formally break up into a series of individual presentations for different groups.

The examples, strategies and approaches discussed in this article suggest that the key to truly inclusive moments lies in close cooperation at all levels: Museums and their visitors need to be in close contact and exchange with one another. Museums have to adapt to their guests in an organised and systematic way, and the visitors can, wherever necessary, prepare and organise their museum tours together, finding at the same time a way of empowering one another and creating new opportunities. In this way, the apparent contradiction between *inclusion*, i.e. the simultaneous and equal participation of all, and the necessary *differentiation*, i.e. a variety of different, supportive services for people with different needs, might be addressed. Enabling everyone to enjoy science and art exhibitions and shaping the development of a truly inclusive museum culture is an objective that can only be realised by jointly developed and organised strategies of all those involved.

For academic research, there is a desideratum to develop comprehensive linguistic concepts aimed at improving accessibility in museums together with professionals working in the field of museum education. Those concepts might take into account and bring together the aspects mentioned in this article. An evaluation and empirical analysis of such language concepts should be carried out with the involvement of the respective target groups.

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Johannes Schädler

Accessible administration – fundamental aspects and action

1 Introduction

According to the UN-Convention on the Rights of Persons with Disabilities (UNCRPD) and legal guidelines at the federal and state levels, national and other public administrations must recognise their responsibility to provide accessible content and ensure the equal use of their services for people with disabilities (see Lang in this volume). Accessibility is a relatively new and conceptually still somewhat unwieldy requirement in an area of society that is characterised by ongoing and intensive modernisation debates (cf. Jann/Wegrich 2010).

The following text deals with what is meant by the guiding concept of 'accessible administration' and what steps can be taken by those responsible who want to 'set off' in this direction. First of all, an attempt is made to sketch the historical development path of the relationship between public authorities and citizens. The assumption is that administrative action has become increasingly democratised over the past decades. In the course of this development, the authorities have developed important competences in dealing with the diversity of people who use or depend on administrative services. These modernisation processes have ensured that the guiding idea of 'accessible administration' is compatible with many offices and authorities and that its inclusion in everyday routines can succeed. Afterwards, selected concepts and experiences are presented on how administrative organisations can become increasingly accessible.

2 From subject to 'client'

In the course of general social democratisation endeavours, efforts gained strength in the 1970s that advocated a consistent renunciation of the "authoritarian state with a subject mentality" (Jaspers 1966: 155; English translation of the German original) in the relationship between the state and its citizens. Until well into the early decades, as Karl Jaspers states in his analysis of the situation in the Federal Republic of Germany (Jaspers 1966), this relationship was characterised by Wilhelminian state worship and authoritarian attitudes. State action was characterised by "mistrust of the people" (ibid. 175; English translation of the German original). Consequently, the citizen had to show respect for the state authorities – embodied by politics and the authorities – and obediently comply with the guidelines and orders. This was also reflected in the sovereign-hierarchical way in which the tasks of public offices and authorities were understood and how the concerns of citizens were dealt with. Conversely, there was also a lack of democratic knowledge and civic self-confidence on the part of the population. In 1966, Jaspers wrote that the German constitution was as unknown among the people today as it was at the time of its adoption (ibid. 177).

In the 1970s, efforts were made to liberate the relationship between public administration and the citizens from the relics of a pre-democratic relationship between citizens as subjects and the state as authorities, and to finally place it on a new conceptual basis. The concept of 'proximity to the citizen' (cf. Grunow 1978; English translation of the German original) was the guiding principle for this, and it spread rapidly in the years that followed. The background to this was, on the one hand, the administrative area reforms, in which the existing municipalities, cities and districts were merged into larger units in numerous federal states. This often contentious process was accompanied by the need to meet the interests of citizens for the simplest possible access to administrative services, as their places of residence were now often further away from the administrative centres.

In the conceptual elaborations, however, it quickly became clear that it was not only distance problems that were to be solved with the term proximity to citizens, but that significantly more dimensions of accessibility played a role.

It was also about more than just appealing to the officials and employees in the authorities to treat the citizens who contact them in a friendly manner. Rather, new professional requirements for administrative action were formulated, which demanded an orientation towards the needs, problems and rights of citizens. Administrative science saw this as an opportunity to make the relationship between the state and its citizens the subject of public discussion and to shape it according to new, democratic criteria (Grunow et al. 1988). In concrete terms, this discussion led to the creation of "citizens' offices" or "Bürgerbüros" as low-threshold contact points in many municipalities in the 2000s. The aim was mainly to offer all short and frequent administrative services flexibly and quickly in one place.

The relationship between the administrative offices and the citizens was given a somewhat different emphasis in the concepts of the New Public Management as "the new control model of the local office for the simplification of administration" (English translation of the German original). Often parallel to the further development of citizen-oriented administrative concepts, administrative action was understood from a more economic perspective as a "service" and the relationship to the population developed within a "customer-supplier" model (cf. Jann/Wegrich 2010: 180). In the foreground of this model was the endeavour to offer administrative services as cost-efficiently as possible. The main focus was on privatisation, personnel management, the introduction of IT and internet-based technology and the introduction of a product- and output-oriented cost logic. At the same time, the administrative staff were to develop a customer orientation that is oriented towards service attitudes such as politeness, reliability, punctuality and adherence to professional standards.

The subsequent administrative policy model of the "activating state", which continued the service model especially in the so-called service administration, certainly had an influence on the general behaviour of the authorities towards the population. Within the framework of contract models, requirements were developed for the administration to negotiate agreements with citizens entitled to benefits, in which mutual rights and obligations are defined (Jann/Wegrich 2010: 181). The idea of the citizen as a contractual partner of the administration cannot be further elaborated here in its patriarchal-pedagogical ambivalence ("promoting and demanding") and in its relativisation of social rights. The

approach has been institutionalised in some incentive systems, such as in the area of the unemployment benefit type II (ALG II) under German law or in the area of the integration assistance for people with disabilities according to § 145 of Volume XII of the Social Code (target agreement on participation).

Administrative action was further shaped in the 2000s by the more decisive debate on equal opportunities and equal treatment of men and women (cf. Krell/Mückenberger/Tondorf 2004). The German Act on Equal Opportunities for Persons with Disabilities (BGG) of 2001 (amended in 2017) initially only had an impact on federal departments and authorities, but also triggered demands for gender mainstreaming programmes at state and municipal levels, which in turn also had a sensitising effect on the service cultures in the authorities. In order to prevent structural discrimination, in addition to regular gender equality reports, signage, notices, information carriers and various procedures were changed in many places to be gender-neutral and thus more respectful. At the same time, the democratic demand for citizen-oriented administrative action has therefore most likely increased within the administrative offices.

For some years now, public administration has been confronted with the fact that German society is becoming increasingly culturally and ethnically differentiated and that the 'clientele' of the administration is becoming more diverse along with the population as a whole. Increasingly, problems of communication have to be overcome, which are also, but often not only, of a linguistic nature. To cope with them, foreign language skills and intercultural competences have become more necessary and more available on the part of the administration than before. This has also created conducive conditions for coping with the challenges associated with the equal treatment of people with disabilities in everyday administrative life.

In the following, the challenges we are dealing with and how they can be implemented in administrative offices will be outlined. The explanations are based on various projects of the "Zentrum für Planung und Evaluation Sozialer Dienste (ZPE) (English translation: Centre for Planning and Evaluation of Social Services) of the University of Siegen in municipal administrations within the framework of the research focus on participation planning.

3 UN-Convention on the Rights of Persons with Disabilities (UNCRPD) and equal enjoyment of administration services

With the ratification of the UN Convention on the Rights of Persons with Disabilities in 2009, a human-rights-based understanding of disability was adopted into the German legal system, which addresses both the federal and state levels, but in many respects also the municipal policy level. In the UNCRPD, 'disability' is not understood as a characteristic of a person, but as a restriction of participation opportunities. These limitations result from an interaction between a person's functional impairments and a lack of compensatory opportunities or barriers in their environment. The view of disability is thus expanded to a view of social conditions and the conditions of the eco-social space in which a person lives and develops. Regardless of the type and severity of their impairment, people with disabilities have the right to equal participation.

From such an understanding of disability, tasks are derived that affect the legal and administrative system, but also everyday social and cultural life as a whole (cf. Degener/Diehl 2015). The fewer barriers people with disabilities face in everyday life and in the course of shaping their lives like others, the less of a disabling effect their individual impairments will have. This can be seen for example in the slightly pithy yet catchy slogan *"You are not disabled, you are disabled by others."* Article 9 of the UN Convention on the Rights of Persons with Disabilities explicitly takes up this connection under the heading 'accessibility' and obliges all levels of government to remove barriers to participation:

> To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas (Article 9 (1) UNCRPD).

Due to the importance of immediate social and spatial environments for the development of disabilities, the municipal level is brought to the fore at all levels of government. According to Article 28 of the German constitution, the municipalities are responsible for the so-called general provision of services of general interest in their local authority. The resulting tasks of the municipalities follow a local cross-sectional logic. They range from energy and water supply, health care, public transport, education, cultural, sports and leisure facilities, etc. to the provision of a social infrastructure to supply the population with social facilities and services of various kinds. In many of these areas, people with disabilities – like everyone else – come into personal and written contact with municipal administrative bodies. The sometimes abstract demands of the UNCRPD for inclusion and equal participation can quickly become concrete and practical, e.g. if

- a deaf or severely hearing-impaired person wants to apply for an identity card or
- a person with a chronic mental illness wants to find out about services provided by the integration assistance system, or
- a blind person or a person with profound visual impairment wants to register a guide dog or
- a person with a mobility impairment (wheelchair user) wants to enquire about barrier-free housing, i.e. a suitable wheelchair-accessible flat in the city and obtain advice, or
- a person with an age-related mobility impairment wants to visit the advice centre for senior citizens, or
- a person with cognitive impairment wants to apply for housing benefits.

In addition to local authorities, state and federal authorities as well as the local representatives of the various German Social Security Agencies (health insurance funds, long-term care insurance funds, the Federal Employment Agency, contact points for pension and accident insurance) are in direct contact with citizens. To make administration services accessible without discrimination

for people with disabilities, the different problems of people with disabilities mentioned in the examples have to be considered.

The UNCRPD describes "discrimination on the basis of disability" as

> Any distinction, exclusion or restriction on the basis of disability which has the purpose or effect of impairing or nullifying the recognition, enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms in the political, economic, social, cultural, civil or any other field. It includes all forms of discrimination, including denial of reasonable accommodation (Article 2 (3) UNCRPD)

The right to equal treatment is to be realised differently for people with mental or cognitive impairments than, for example, for people with sensory impairments or a mobility impairment. In addition to personal openness, a prejudice-free, helpful approach requires that the employees of an administrative office are sensitive to the risks of discrimination and have a certain amount of knowledge, which can be acquired, for example, through appropriate further training.

4 Accessibility and local administrative action

The original English text of the UNCRPD, Art. 9 is entitled "Accessibility", which has caused some uncertainty in the German translation with regard to the terms "Zugänglichkeit" (accessibility) and "Barrierefreiheit" (absence of barriers). Fortunately, through the amendment of the German Act on Equal Opportunities for Persons with Disabilities (BGG) a differentiated formulation of the term accessibility was created:

> Accessible are structural and other facilities, means of transportation, technical consumer goods, information processing systems, acoustic and visual sources of information and communication facilities as well as other created areas of life, if they can be found, accessed and used by people with disabilities in the generally customary manner and without

> the assistance of others. The use of auxiliary aids, which are needed because of the disability, is allowed. (§ 4 German Act on Equal Opportunities for Persons with Disabilities (BGG); English translation of the German original).

This definition includes four central dimensions for the term accessibility:

a) The modalities of use (standard, without complication and without outside help),
b) retrievability,
c) accessibility and
d) usability

Along these dimensions, it is possible to operationalise the concept of accessibility and, if necessary, to make it usable for organisational development measures in public administrations. This will be further substantiated. Fortunately, public advisory services have also been established in recent years, which, in addition to private providers, can help interested administrations to improve their accessibility. Of supra-regional importance and with a broad spectrum of competences is, for example, the Agentur Barrierefrei NRW, see: www.ab-nrw.de. For examples of good practice see the project "Inklusionskataster NRW" at the University of Siegen: www.inklusive-gemeinwesen.nrw.de (Accessed on 03.02.2018).

4.1 Modalities of use for administration services

For administrative offices, the above-mentioned definition of accessibility means that these offices and their services can be used by people with disabilities in the usual way, without particular difficulties and, in principle, without outside assistance. With regard to physical barriers, this is certainly a requirement that can often only be achieved gradually. In order to meet this requirement, it makes sense for administrative organisations to orient themselves towards the idea of 'universal design'. The UNCRPD defines this

> as the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design […] (Article 2 (5) UNCRPD).

If we assume that people with disabilities should be able to use the services of administrations just like everyone else, the consequences of their differences for the organisation of an inclusive administration are twofold: On the one hand, the general conditions of use must be improved, and on the other hand, special measures must be taken to compensate for the non-compensable limitations of individual groups of people with disabilities. In this context the UNCRPD talks of "reasonable accommodation" which means

> necessary and appropriate modification and adjustments not imposing a disproportionate or undue burden, where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms (Article 2 (4) UNCRPD).

As described, it is a matter of making or maintaining the appropriate arrangements that people with specific impairments need in order to be able to conduct their affairs with the administration without discrimination. In principle, the approach of "universal design" does not exclude special aids for certain groups of persons with disabilities, as far as they are needed. However, priority should be given to considerations of universal usability without the need for disability aids.

4.2 Retrievability

One of the core dimensions of an accessible administration is to ensure that relevant services can be found by people with different types of impairments. For this purpose, it is necessary to develop a suitable information and guidance system for each administrative office, which can consist of visually or tactilely perceptible signs, tactile overview and guidance boards, acoustic information carriers, Braille or tactile paving. The provisions for retrievability concern, on the one hand, the actual, physical route to the administrative office. Here, as

well as in ensuring accessibility, it is advisable to orientate oneself according to the concept of 'mobility chains', i.e. to focus on typically used routes or local traffic routes that lead to the relevant administrative office (e.g. from the railway station to the town hall). On the other hand, the design of an information and guidance system within the administrative office is of essential importance as well. The underlying concept should be based on several information channels in order to do justice to the different possibilities of perception of people with disabilities.

The dimension of retrievability as part of accessibility also refers to the task of making the different offices and agencies findable on the Internet. This includes checking whether the relevant websites of the administrative offices meet the criteria of accessible design. It is helpful that assistive technologies can be used to provide access for different target groups and make information about individual administrative offices retrievable (e.g. screen reader, screen magnifier, eye control or other alternative controls or apps).

4.3 Accessibility

An easily accessible administrative office constitutes added value for all. Lifts or easy-opening doors or automatic door openers make it easier for many other groups of people to go to the authorities, such as people who are temporarily restricted in their mobility (injured or ill), people with prams, other loads or the elderly who have age-related impairments. There are a variety of barriers or obstacles that can be divided into different dimensions. Some are obvious, i.e. easy to recognise. These include structural, spatial or infrastructural barriers, for example the insurmountable stairs for wheelchair users or citizens with walkers or prams. Then there are communicative barriers that are less recognisable, such as language difficulties, which can lead to general communication problems.

Furthermore, there are sensory barriers that are equally less obvious. These include unclear, poorly legible information, low-contrast colours, lack of visual or tactile cues. For people with visual impairments, for example, forms such as applications or information signs may be written too small. If, for example, there is a lack of colourful, high-contrast markings on a stair railing, this represents an acute source of danger.

Furthermore, 'barriers in the mind' should be mentioned, which can be understood as (discriminatory) norms and values and attitudes of administrative staff or also a lack of knowledge about the consequences of impairments.

4.4 Usability

In principle, persons with disabilities should be enabled to exercise their full civil rights vis-à-vis administrative bodies of various kinds. This includes being able to apply for any administration-related service and to carry out the related activities independently. Independent in this sense means without the help of third parties wherever possible.

This poses the challenge for administrative bodies to design the spaces, structures and processes in such a way that they can be used not only by 'able-bodied persons', i.e. by functioning average adults, but by as many people as possible, regardless of age and physical structures. For accessible administration, this means access without barriers to rooms, parking spaces for people with disabilities and ensuring independent mobility in the administrative buildings. In addition to spatial accessibility, the accessible design of personal contacts, e.g. appointments at the office, home visits, joint local appointments and telephone calls, is relevant. It is important for all citizens that applications, information materials and decisions are available in a comprehensible form and that correspondence is easy to understand. Correspondence usually consists of decisions, various information materials, official letters or e-mails.

All people who deal with an administrative office that is on the path to accessibility benefit from it. The occasions and the resulting administrative acts are extremely diverse from one type of administration to another (health insurance company, employment agency, city hall, etc.) or, for example, even within a local administration, and the differences between the tasks of the vehicle registration authority, the foreigners' office, the social welfare office or the health office are obvious. Irrespective of the different office cultures and topics, however, a procedure that is comprehensible to everyone benefits both the citizens and the employees of the authorities themselves. As a result, fewer enquiries and fewer misunderstandings are to be expected in the relevant administrative process. At the same time, simplifying the language increases

trust in the authorities and institutions and reduces existing reservations about using services.

It is not uncommon for people with disabilities to find situations such as actively visiting an administrative office new and unfamiliar. In the past, these matters were mainly performed vicariously by others. For this very reason, administrative staff should be prepared for this new situation and be open to individual solutions, regardless of the type of disability of the person seeking advice.

5 Development of an inclusive administrative culture

Administrative bodies are organisations that have developed a specific organisational culture. Organisational culture (Schein 1985) is understood to include not only tangible, visible things but also typical knowledge and behavioural structures and, above all, deep-seated belief systems and attitudes that administrative staff acquire in the course of their professional practice. Certain assumptions which are taken for granted and are related to the proper handling of people with disabilities in everyday administrative life are also a part of organisational culture. Thus, the task is to promote the development of an 'inclusive culture' in the authorities. For example, an inclusive culture in a local government includes a certain proactive-empathetic attitude towards a person with an impairment seeking advice. This can be expressed, for example, by thinking about how an independent visit to the authorities can be made possible despite a physical or mental impairment or, if necessary, in the case of barriers that cannot be changed easily, what alternatives could look like that are not discriminatory. An inclusive culture can be developed through culture-building measures. Examples of this are: systematic inspections of administrative offices with the help of people with disabilities, invitations of self-help organisations to internal meetings or the implementation of projects and joint activities with self-help organisations.

Larger administrations, in particular, are usually divided into several departments whose areas of expertise relate to many different areas of citizens'

lives (e.g. youth, health, school, social, transport, building administration, etc.). The individual departments and subject areas relate to very different fields of action with different forms of communication and therefore also different understandings of reality. In turn, each individual organisational unit has its own self-image and follows certain logics of its own. If an inclusion-oriented administration is to become the overarching guiding principle, then all administrative areas should be addressed, but especially those with intensive contact with citizens and of course also the 'disability-specific' departments.

6 Inclusion-oriented strategic concepts for administrations

Finally, two strategic concepts for administrations will be outlined exemplarily that contribute to improving the accessibility of individual departments and administrative organisations as a whole by applying systematic activities. On the one hand, the concept of the state capital Wiesbaden "Leitfaden für eine barrierefreie Verwaltung" (English translation: "Guidelines for an accessible administration") (2016) will be presented, which stands for a purely internal administrative approach. On the other hand, a brief overview of the Centre for Planning and Evaluation of Social Services work aid "Inclusion-oriented administration" (Konieczny et al. 2012) will be given, whose approach is based on sensitising the administrative office through cooperation activities with persons from the disability self-help sector.

6.1 "Guidelines for an accessible administration" (Wiesbaden)

The Wiesbaden action plan for an accessible city administration was prepared by a project group of the Office of Social Work as part of a project funded by the State of Hesse and released in 2016 with a foreword by the mayor. The guideline refers to the UN Convention on the Rights of Persons with Disabilities and is aimed at "all people who contact the city administration […] especially people with a wide range of disabilities and people with a migration background" as well as all employees of the city administration (ibid. 7; English translation of the German original). In the course of the project, concrete examples from

different areas of the city administration were used to develop criteria and suggestions on how decisions, brochures and other information materials can be presented in easily understandable forms and accessible formats. Furthermore, information was systematically compiled on how certain precautions and procedures can facilitate the communication of administrative staff with people with different impairments. With these materials as a basis, a one-and-a-half-day training concept for municipal employees was developed, which includes the elements a) factual and technical knowledge, b) awareness-raising and c) dealing with clients. On this basis, training courses for employees from various municipal offices are now held annually and as part of the municipal training directory. Experience shows that "there is a great interest and need for information about all kinds of accessibility measures among the employees. These include audio decisions, the possibility of using a sign language interpreter, explanations in Plain Language, behavioural patterns of people with mental/cognitive illnesses and how to deal with them, etc." (ibid. 21; English translation of the German original).

6.2 Centre for Planning and Evaluation of Social Services work "Inclusion-oriented administration"

The ZPE action concept was developed in 2014 as part of a project together with the Olpe district administration (Konieczny et al. 2012). It aims at strengthening the sensitivity of administrative staff to discrimination risks and participation rights of persons with disabilities in everyday administrative work. The action concept is based on the fact that people with different disabilities are actively involved in the search for barriers in administrative actions as 'experts in their own matters' via exploratory inspections. At the same time, this should make it easier to find appropriate solutions to enquiries and problems. By involving people with disabilities in the identification and reduction of barriers, the competence of administrative staff in dealing with people with disabilities should also be strengthened.

The approach should be based on the individual level of development of an administrative organisation. Steps taken so far in the direction of accessibility should be consciously identified and further developed; barriers that have not yet been recognised or dealt with should be addressed and examined for solu-

tions. The aim is to support the claim of municipal administrations to fulfil the exemplary function of a public administration.

The concept consists of five work steps, which should lead to 'recommendations for action for the development of an inclusion-oriented administration':

1. Establishment of a project group consisting of administration and self-help organisations of people with disabilities.
2. Information event for all departments
3. Written survey among employees in all administrative departments on their experiences with people with disabilities with the aim of identifying the need for change
4. Administrative inspections ('explorations') by teams consisting of people with disabilities and administrative staff
5. Development of concrete recommendations for action by the project group
6. Decision-making on recommendations for actions by the head of the administration

The collected information of the cooperative concept is based on a written survey and systematically conducted exploratory inspections. Ideas and concrete suggestions for changes can be collected through written surveys. Experience shows that the questions encourage employees to reflect on barriers that may have been accepted or overlooked in the past and make it easier to put themselves in the position of people with different forms of disability. This way, individual as well as department-specific learning processes can be initiated. Proposals for a respective questionnaire can be found in the appendix of the publication.

The method of inspection is particularly suitable for identifying problems of retrievability, accessibility and usability with regard to the mobility chain to the authority and within the administration (buildings) as well as in administrative service processes (e. g. during telephone calls with the authorities). In cooperation with local self-help organisations, people with various disabilities are to be recruited for the project. The approach of task-related investigations, in which – in the sense of role play – differently disabled persons visit the administration to use selected services, has proven to be effective. Care should

be taken to ensure that they and the associated contact points are selected to cover as wide a range of different parts of the building and services as possible. Examples of selected services as well as suggestions for so-called inspection forms can also be found in the appendix of the aid.

The task of the project group constituted at the beginning of the process is to summarise the survey and inspection results and develop a template for an action plan with recommendations for action that relate to the removal of barriers considered to be particularly urgent. The recommendations for action would then be submitted to the responsible bodies for consideration and decision-making.

7 Concluding remarks

The principle of equal participation in social life for all people regardless of race, gender, origin, age or disability is deeply democratic in nature. Within the framework of the UN Convention on the Rights of Persons with Disabilities, it was codified, as it were, as an exemplary human right for persons with disabilities that touches all areas of public life. The opportunity to participate presupposes the opportunity of access to institutions and facilities for the general public. For a long time, these normal institutions were only open to people who moved within a rather narrow spectrum of normality. If people had more severe impairments or other psychosocial demands, they were not considered and remained excluded. For a long time, these contexts also applied to public administrative bodies and thus an area in which democratic principles such as the right to equal treatment are particularly significant for social life. In the course of implementing the UN Convention on the Rights of Persons with Disabilities, public administration in its many forms is now naturally also required to examine its processes to see to what extent they discriminate against people because of physical or other impairments. In this text, it is argued that due to the modernisation processes in administrative practice, good conditions have arisen for inclusion to become an integral part of a democratic administrative philosophy. Corresponding examples and action orientations are available.

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Thomas M. Schindler

Approaches to accessible communication in the medical and pharmaceutical sectors

Almost everybody experiences brief or permanent illness over the course of their life and resultingly searches for medical or pharmaceutical information, for example if they want to alleviate the symptoms or cure the disease by taking medication. Medical and pharmaceutical information, however, is not only important in moments of acute illness. Access to medical-pharmaceutical contexts – and an understanding thereof – is crucial to staying healthy and preventing illnesses. Being able to understand medical and pharmaceutical information is an important part of health literacy and therefore directly relates to quality of life (see also Maaß/Rink 2017).

This article will not address health-related information in general. It will instead focus on medical and pharmaceutical information, which is more narrowly defined. In the absence of a universally accepted definition, this is to be understood as information and knowledge relating to the research, development, application and effect of medication. Medical and pharmaceutical information is – in a way – surrounded by barriers, because it is complex in terms of content, often contains figures and needs to be formulated in a way that is generally understandable but also legally secured. Any improvement regarding accessibility and the reduction of barriers will benefit a whole number of people.

In this article, two documents will be introduced. They are intended to present complicated medical and pharmaceutical data and relations in a way that is generally understandable: patient information leaflets (package inserts for medication) and lay summaries (summaries of the results of clinical trials for a lay audience). Both text types should be "easy to understand" and written in "Plain Language". Guidelines on how to achieve this are available for both text types. However, the guidelines do not define the terms "Plain Language"

or "simple language", which are presumably understood as simplified versions of the standard language (as in: Bock 2015: 85, Bredel/Maaß 2016: 526 ff.). For both documents, a commitment to improved comprehensibility and to the use of Plain Language is prescribed by law within the EU-Directive 2001/83/EC (section 63(2)) and the readability guideline (EC 2009: 7–10) for patient information leaflets, and the REGULATION (EU) (sections 39, 67, § 37, No. 536/2014) for lay summaries.

A comprehensive specialised language, which is primarily used between experts ("expert2expert"), has developed in the medical and pharmaceutical sector. Biomedical and pharmaceutical progress and the global orientation of the pharmaceutical business approach make this specialised language extremely productive and allow for a constant introduction of new terms and concepts. For decades, communication between experts (doctor – doctor, doctor – pharmacist, pharmaceutical company – regulatory authorities, regulatory authorities – doctors) has excluded patients almost entirely. Only since the 1970s has there been a gradual change from a paternalistic relationship to a cooperative relationship between doctors and patients. However, a cooperative relationship between doctors, patients, pharmacists and pharmaceutical companies is only possible through adjustment and reduction of the information gap. Only if patients fully understand the benefits and risks of different treatment options, can they choose the best treatment according to their current situation (Böning 2017, Riedler 2013).

It is a special feature of communication between pharmaceutical companies, patients and healthcare providers, i.e. doctors and pharmacists, that they have to comply with strict legal requirements on a national and international judicial level. State or supranational regulatory authorities are also important communication partners for the authorisation of medication and the monitoring of the safety of medical products. Many documents, such as patient information leaflets, need to be approved by regulatory authorities before being published. The final version of the package information leaflet is agreed upon between pharmaceutical manufacturers and regulatory authorities.

1 General characteristics of medical and pharmaceutical information

Medical and pharmaceutical information is characterised by a number of features that can constitute individual barriers. These characteristics are summarised in Figure 1.

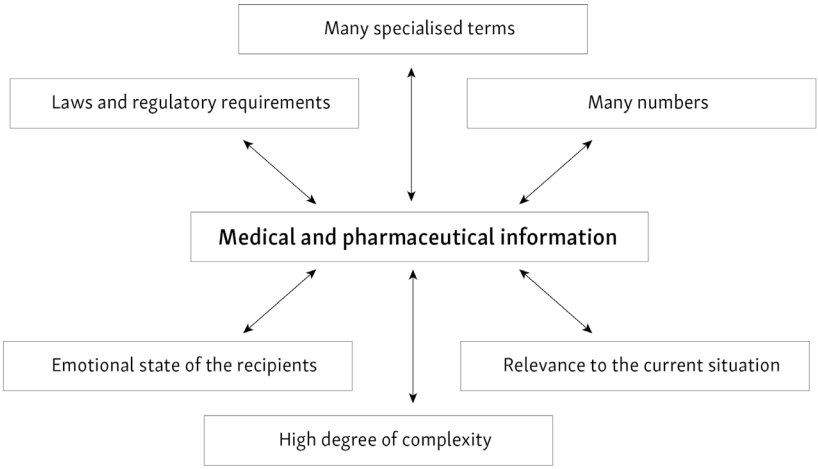

Figure 1: Characteristics of medical and pharmaceutical information

Medical and pharmaceutical information contains elements from different sciences (medical science, biology, chemistry, pharmacy, clinical research) and is therefore generally complex. They are often linked to numbers that express crucial aspects. In many cases, the value of a number distinguishes between being "healthy" or "ill". Many medical and pharmaceutical concepts are grounded in technical terms that have Greek or Latin roots or originate from the English language. The supply and written transmission of medical and pharmaceutical information between manufacturers and users is subject to strict legal requirements. The legal regulations are intended to ensure that physicians and patients have access to complete and objective information. The legal regulations do not only cover the type of information to be presented, but also the communicative context as well as layout and formatting.

Recipients often look for, transmit, and receive medical and pharmaceutical information in a state of emotional distress. This emotion stems from direct personal relevance, for example after the diagnosis of a serious illness of the recipient or one of their relatives. This is important because strong emotions may have an influence on reading comprehension (Bohn-Gettler/Rapp 2011, Langer/Frie 2017).

To benefit from medical and pharmaceutical progress as immediately as possible, many recipients of medical and pharmaceutical information have a particular interest in the newest and most innovative outcomes and developments. However, the most current findings may be relatively uncertain, precisely because they have not yet been incorporated into the recognised specialist knowledge of a certain field. The uncertainty does not only refer to the importance that the results have for medical care, but also to the validity of the methods used. Experts are of course also confronted with this "provisional nature" of the latest information. When a patient enthusiastically presents their doctor with a copy of a brand-new publication, they are likely to be met with reluctance, since even an expert is not able to conclusively assess the relevance of the results at the current time.

2 Patient Information Leaflets (PIL) as key documents in medical and pharmaceutical communication

Since 1992, every medicinal product sold in the European Union must be accompanied by a package information leaflet (PIL, also known as package insert or package slip). If patients do not receive detailed instructions regarding the medication from their prescribing doctor or pharmacist, the patient information leaflet is often their only source of information. The patient information leaflet, a document consisting of 4 to 10 pages, has to provide the patient with all the important information about a medicinal product; its purpose, how it works, associated risks (side effects) etc. If patients do not understand the information provided in the patient information leaflet, not only the therapeu-

tic objective may be at risk, but patients may even endanger themselves if they use a medicinal product incorrectly.

A patient information leaflet should fulfil at least three communication requirements:

- Patients expect the patient information leaflet to contain comprehensible information about the use and risks of a medicinal product.
- For pharmaceutical companies, the structure and text of a patient information leaflet must enable safe use of the medication, exclude liability risks and comply with legal requirements.
- Legislators as well as regulatory and supervisory authorities want to ensure the protection of patients and want to create the same framework conditions for all competitors by designing patient information leaflets in a coherent format.

Some of these communication objectives compete against each other: Comprehensibility vs. specialised correctness, legibility and brevity vs. complete list of risks, legal requirements vs. adaptation to a specific medication.

The patient information leaflet is a highly regulated document. The content, as well as form and linguistic design, even individual phrasings, need to follow legal requirements at national and European levels. At the European level, the requirements are laid down in the Community code relating to medicinal products for human use (2001/83/EC, title V). Section 59 defines which information must be given in the patient information leaflet, and in which order it should appear. Section 61 states that drafts for the patient information leaflets have to be submitted to the authorities while still in the authorisation process; and that the authorities will refuse authorisation if there are any aspects that have not been adequately presented. Lastly, section 63 states: "The package leaflet must be written and designed in such a way as to be *clear and understandable*, enabling users to act appropriately, *when necessary with the help of* health professionals. The package leaflet must be *clearly legible* in an official language or official languages of the Member State […]." (§ 63 2001/83/EG, title V, *my emphasis*).

To harmonise patient information leaflets and scientific information on medicinal products (expert information) on a European level, a working group

("Working group on quality review of documents") was established in 1996. The aim of this group is to assist the European Medicines Agency (EMA) in regard to the linguistic aspects of these documents. The working group meets regularly and deals with topics such as linguistic clarity, accuracy and consistency of patient information leaflets. It evaluates terminological consistency of translations in regard to the source material, promotes aspects of legibility and aims at contributing to a common understanding of legal requirements and directives (EMA 2014: 1–2). The working group has developed "QRD templates" for certain types of content, which contain binding information that must be included in the patient information leaflet. This standardisation of texts in patient information leaflets is intended to advance the harmonisation of information on medicinal products within the EU.

In 1998, a European Guideline on the readability of the labelling and package leaflet of medicinal products for human use (Revision 1, 2009) was established. It describes how patient information leaflets can be worded in a comprehensible way (Table 2). The readability guideline also describes the target group: "The package leaflet is intended for the *patient/user.* If the package leaflet is well designed and clearly worded, this maximises the number of people who can use the information, *including older children and adolescents, persons with poor literacy skills and persons with some degree of sight loss*." (ibid.: 7, *my emphasis*).

The readability guideline dictates that patient information leaflets need to be tested by patient groups in terms of their legibility and how easy it is to locate certain information. There are exact specifications for how these tests must be developed, performed and evaluated. Since 2005, all package inserts must be checked by patient groups. The documentation for these tests must be submitted with the registration dossier. In 2015, the German Federal Institute for Drugs and Medical Devices (BfArM) made the requirements of the readability guideline and the QRD format templates binding for German patient information leaflets as well (BfArM 2015).

In Germany, the content of patient information leaflets is regulated by section 11 of the German Medicinal Products Act (Arzneimittelgesetz, AMG 2005). It specifies which information needs to be included in the patient information leaflet, and in which order. The information needs to be "*in easily legible, readily comprehensible German* […]" (Section 11 AMG, *my emphasis*).

1. Identification of the medication: name of the medication, substance or indication group or the mode of action
2. Areas of application
3. A list of information that needs to be known before administration of the medication: Contraindications, appropriate precautions regarding use, interactions with other medication, warnings
4. Instructions for correct application, dosage, method of administration, frequency of administration, and if necessary, the appropriate time, duration of treatment, if it needs to be determined, advice in case of an overdose, in the case a dose is skipped or information about undesirable effects in the case of discontinuation, the explicit recommendation to consult a physician or pharmacist if you have any questions regarding the application
5. Description of side effects which may occur during correct use of the medication; countermeasures to take in the case of side effects if required by the current state of scientific knowledge; for all medications, an additional standard text is to be included in which patients are explicitly requested to report any suspected side effects to their physicians, pharmacists, health professionals or directly to the competent higher federal authority
6. Indication of the expiry date shown on the packaging and warning against using the medication after that date, special precautions for storage and indication of the expiry date after opening the container, warning of certain visible signs that the medication is no longer safe for use, full qualitative composition in terms of active ingredients and other components, dosage form and content by weight, nominal volume or quantity for each dosage form of the medication, name and address of the pharmaceutical company and, if available, of its local representative, name and address of the manufacturer or importer
7. For medications that are sold under different names in other Member States of the European Union, a register with the names authorised in each Member State needs to be included
8. Date of last revision of the patient information leaflet

German Medicinal Products Act (Arzneimittelgesetz, AMG) in the version published on December 12, 2005 (BGBl. I p. 3394), last amended by section 1 of the act on July 18, 2017 (BGBl. p. 2757).

Table 1: Mandatory information that must be included in the patient information leaflet according to section 11 AMG

Since its introduction in Europe in 1992, there have been many regulatory initiatives to make patient information leaflets as comprehensible as possible:

- Explicit legal requirements regarding content and structure (EU regulations, AMG),
- Defined texts for certain sections (QRD format templates),
- Instructions for linguistic means that should be used (readability guideline).
- The obligation to test patient information leaflets with patients.

There is now empirical evidence which shows that these initiatives have actually led to package leaflets being understood by the majority of patients.

3 How do users rate patient information leaflets?

In a study conducted in 2003, the scientific institute of the AOK (*Allgemeine Ortskrankenkasse,* German health insurance provider) presented 70 test persons with package information leaflets of the 100 most prescribed medications, and had the participants assess the legibility and comprehensibility of those patient information leaflets. In addition, 1900 patients insured under the statutory health insurance scheme who were prescribed any medication in the past year were interviewed about patient information leaflets in a structured survey via telephone (Nink/Schröder 2005). As the investigation showed, many patients (89.9%) rate the patient information leaflet as important or very important (Nink/Schröder 2005: 53) Almost all insured persons (98%) read the patient information leaflet at least partially; 57% stated to have read it in its entirety (ibid.: 53). Even though 63% of insured persons (ibid.: 61) felt well informed, 28% of patients stopped taking the medication they were prescribed after reading the patient information leaflet (ibid.: 56). Around one third felt unsettled by the information in the patient information leaflet (ibid.: 56). For the assessment of the comprehensibility of patient information leaflets, the participants' education (the higher the level of education, the fewer comprehension problems) and age (the older the participants, the more comprehension

problems) were important contributing factors. Among the respondents over 60, at least 23.9% rated the patient information leaflet as incomprehensible or very incomprehensible (ibid.: 69). This result is relevant, since the group of over 60-year-olds accounts for the largest share of prescriptions (61% of all daily doses of medications [ibid.: 50]).

Similar results were obtained in a more recent random sample (computer-aided surveys via telephone based on a structured questionnaire) with 2600 adults. In comparison with information available on food packaging, product information by electricity providers, mobile network operators, banks and insurance companies or tax return declarations, patient information leaflets are at the forefront when it comes to comprehensibility: 32 % of respondents found them comprehensible, while product information from insurance companies were only rated to be comprehensible by 5% of respondents (ERGO 2012: 10).

On behalf of the European Commission, an international working group examined whether patient information leaflets fulfil their role as a source of information about medications for patients and health professionals (physicians, pharmacists). The aim was to identify the positive and negative aspects of patient information leaflets and to suggest potential improvements (van Dijk et al. 2014). The study included an extensive analysis of the literature and a survey conducted with a (English-language) questionnaire. Although conducted throughout Europe, the usable response rate was very modest (49 patients, 33 health professionals, 123 representatives of pharmaceutical companies), so that representativeness was not reached. It was established that both patients and health professionals saw a clear need for improvement. On a scale of 1 (low) to 9 (high), the overall quality of patient information leaflets was rated at an average of 5.3 by patients and 5.5 by health professionals (ibid.: 52). The study found that patient information leaflets contained too much overall text, that the texts were too difficult, contained too many medical terms and that too many side effects were listed (ibid.: 70). Furthermore, the font size of many patient information leaflets was criticised as being too small. In addition to using "Good Information Design" to improve the layout, the authors suggest reducing the complexity when listing side effects by only listing those side effects that need immediate treatment. In addition, patient information leaflets should not only name the risks of a medication, but also

indicate the expected benefits. Based on these results, the European Medicines Agency (EMA) recently presented an action plan to improve patient information leaflets.

In a communication science study, the comprehensibility of patient information leaflets was examined using the think-aloud method with 10 volunteers (Loh et al. 2014). Qualitatively, the results largely coincide with those of van Dijk et al. (2014), the authors, however, were able to identify more precisely which sections of the patient information leaflet were perceived as being particularly problematic. They report that the information on contraindications and side effects in particular unsettled the respondents and caused distrust towards the medication and the prescribing physician (ibid.: 1184). In addition to a more comprehensible description of the risks, they also recommend descriptions of the positive effects of the medication in the patient information leaflet (ibid.: 1187).

4 Patient information leaflet – Conclusion

Considering this data, a cautiously positive assessment seems justified. Patient information leaflets are an example of how complicated and multi-faceted medical and pharmaceutical information can be transformed into comprehensible documents through directives. A majority of insured persons (63%, Nink/Schröder 2005: 61) felt well informed by the patient information leaflet, at least significantly better than by product information from banks or insurance companies (32% vs. 5–6%, ERGO 2012: 10). It should not be overlooked, however, that approximately one in five (Nink/Schröder 2005: 69) does not understand this document, and that the group of people aged 60-years and older in particular has comprehension problems. It should also be noted that the measures taken – legal requirements, mandatory text specifications and format templates, a directive for writing these documents and mandatory testing with patients – have obviously had a positive effect, even if there is still much room for improvement.

5 Lay summaries – summaries of study findings for a lay audience

Clinical trials are the most important means for the development of medicinal products. Before a medicinal product can be approved, many trials must be conducted to prove that a new medicinal product is safe and effective. Clinical trials are complex, and their design, execution and reporting need to adhere to a number of international and national legislations. Although many findings of clinical trials have been accessible via study registries (i.e. *clinicaltrials.gov*, *clinicaltrialsregister.eu*) for several years now, the information is intended for specialists and is rarely comprehensible to a lay audience. Thanks to the EU regulation on clinical trials, published in 2014, the obligation to present the results of each clinical trial in a form comprehensible to a lay audience was introduced throughout Europe for the first time (article 39, 67, § 37 EU regulation 536/2014). This makes a document legally binding. Its aim is to present the complex data of clinical trials in a way that is comprehensible to a lay audience.

These "lay summaries" will be published in an EU database, once this portal is available. The lay summaries should be written in Plain Language and are supposed to inform the general public about every important aspect of a clinical trial. The information should be factual and may not be used for covert advertising. The lay summaries should describe the reasons for and main aims of the trial. The demographic data of the study participants and the most important findings on efficacy and safety should be provided (European Commission 2018, Sroka-Saidi et al. 2015, Schindler 2018).

The required contents of a lay summary are only mentioned in Annex V of the regulation and are limited to a list of 10 elements. The European Commission had also recognised the need for a more precise specification, and therefore commissioned the British Health Research Authority (HRA) in August 2015 to develop recommendations for writing lay summaries. An international committee was founded which included all parties. After several months, a first draft was adopted, which was then made accessible for public consultation. After evaluation of the comments received, a final draft was adopted, which was then published in August 2017. A slightly modified Version 2 was already published in February 2018 (European Commission 2018).

Since they are intended for the general public, lay summaries should be written in Plain Language – in such a way that they can be understood by the average reader, or even better, by readers with poor reading skills. It is explicitly required that the texts should be at level 2–3 of the International Adult Literary Survey (IALS) (OECD 2000, Kirsch 2001). By focusing on readers with poor reading skills, the document should be accessible for as many people as possible.

The expert committee provides a number of recommendations on how to phrase complicated concepts and findings of clinical trials in a way that a lay audience can understand. The text, for example, should be structured by using headings, bullet points and short sections. The sentences should be short and concise. Instead of longer sentences, bullet points in combination with short paragraphs should be used. Technical, medical, or other specialist terms should be avoided. Instead, words known to the lay audience should be used (i.e. high blood pressure instead of hypertension). If a technical term is unavoidable, a term known to the lay audience or an explanation should be provided in brackets (i.e. metastasis [development of a secondary cancerous growth in another area of the body]). Unnecessary words should be omitted, and complicated words should be replaced with simple ones. Acronyms and abbreviations should be avoided. The underlying medical concepts should be described in a clear and comprehensible manner. The layout should facilitate reading and make the text accessible. To improve the clarity of the text, as much "*white space*" as possible should surround the text. Using illustrations is recommended, however, not too many should be used, and every illustration should only contain one piece of information. A key should describe the illustration comprehensively. Creative approaches may also be used when writing lay summaries, for example by implementing images, cartoons and informational illustrations (European Commission 2018: 3–7).

Similar to patient information leaflets, a combination of legal requirements and recommendations by experts should enable authors to create a document that describes complicated medical and pharmaceutical information in a way that is comprehensible to a lay audience. Some pharmaceutical companies have already started publishing lay summaries on their websites (i.e. Boehringer Ingelheim Pharma (https://trials.boehringer-ingelheim.com/trial_results.html) or GlaxoSmithKline (https://www.gsk-clinicalstudyregister.com/)).

6 Comparison of the guidelines for writing package leaflets and lay summaries with the rules for Easy Language

If you compare the guidelines for writing package leaflets and lay summaries with the rules for Easy Language, you can see major overlaps (Table 2).

	readability guideline for package leaflets[1]	**expert committee on lay summaries**[2]	**compliance with Easy Language requirements**[3]
target group	patients, consumers, but also older children, adolescents, people with poor reading skills and people with visual impairments	general public without prior knowledge of study, technical terms or clinical research; people with poor reading skills and poor numerical skills	medium (1)
involvement of the target group in the creation process	involvement of patients is required to test legibility, clarity, and ease of use	involvement of patients, patient organisations or citizens is recommended to test comprehensibility	complete (35)
length	–	"as short as possible"	–
information	–	factual information, no advertising content	–
dealing with numbers	–	comprehensible for people with poor numeracy	extensive (11–14)
font size	at least 9 pt. Times New Roman	at least 12 pt.	extensive (22, 23)
	larger font for important information (headings)	–	extensive (23)

	readability guideline for package leaflets[1]	expert committee on lay summaries[2]	compliance with Easy Language requirements[3]
font size	no capital letters (all caps)	no capital letters (all caps)	complete (29)
	no italics and no underlines	no underlines	extensive (29)
design/ layout	no justification	–	complete (24)
	–	lots of "white space", delimit topics with blank lines	–
	–	simple illustrations recommended	–
	at least 1.5 line spacing	–	extensive (23)
	good contrast between text and background is important	–	complete (30)
	no background images	–	complete (34)
	column format for easy navigation in the text	–	–
	keep related information together	–	complete (20)
headings	headings for navigation, no more than 2 hierarchy levels	headings for structure	complete (27)
	uniform heading format	–	extensive (27)
	bold or colour possible	–	complete (29)
print colour	dark text on light backgrounds	black text on white backgrounds	complete (30)
language	"easy to read"	simple vocabulary; simple, everyday language	extensive (4,5)

	readability guideline for package leaflets[1]	expert committee on lay summaries[2]	compliance with Easy Language requirements[3]
language	–	underlying concepts should be explained	–
	–	consistent use of terms/words	complete (5)
	–	no ambiguous terms	extensive (4)
	–	language should express respect for patients	–
syntax	simple words with few syllables	no multi-syllable words	complete (5)
	no long sentences	no long sentences with subordinate clauses, short sentences	complete (17)
	no long paragraphs, lists are favoured	lists instead of text	medium (27)
	arrangement is important, name the most common side effects first	–	–
	serious side effects at the beginning of the paragraph	–	–
style	active rather than passive wording	active rather than passive wording	extensive (10)
	when calling for action, give the instructions first and then state the reasons	–	–
	address patients directly	–	complete (19)

	readability guideline for package leaflets[1]	expert committee on lay summaries[2]	compliance with Easy Language requirements[3]
style	no abbreviations/acronyms, if unavoidable, then explain them	no abbreviations/ acronyms	complete (7)
	no scientific symbols	–	complete (16)
	translate medical terms into colloquial language; first lay term, followed by the technical term; then continue to use the most appropriate term	translate medical terms into Easy Language; first the easy term, then the technical term; complex words should be replaced with simple ones	extensive (5)
	–	first the overview, then the details (inverted pyramid writing style)	–
paper type	no transparent paper, no glossy paper	–	complete (32)
symbols and pictograms	clear and easy to read, no advertising aspects, make text navigation easier	no graphic signs like company logos and pictograms	extensive (33)
links	–	few, as they become obsolete over time	–

1 European Commission (2009) Guideline on the readability of the labelling and package leaflet of medicinal products for human use, revision 1: 7–10.
2 European Commission (2018): Summaries of Clinical Trial Results for Laypersons. Recommendations of the expert group on clinical trials for the implementation of Regulation (EU) No 536/2014 on clinical trials on medicinal products for human use: 3–7.
3 Netzwerk Leichte Sprache (undated). Die Regeln für Leichte Sprache.

Table 2: Comparison of the requirements for writing package leaflets, lay summaries and Easy Language texts

It was determined whether there are rules for writing in Easy Language that correspond with the requirements formulated for writing package leaflets and lay summaries. The numbers in brackets in the "Compliance" column indicate the page numbers on which the corresponding rule is listed in *Die Regeln für Leichte Sprache* ([The Rules for Easy Language]) of the Easy Language Network (Netzwerk Leichte Sprache). "Medium", "extensive" or "complete" matches were distinguished; "–" means that this item is not listed. The categories in the left column were taken from the readability guidelines for package leaflets (European Commission 2009: 7–10).

The matches between the directives affects all levels of documents, content, structure and layout. They unanimously support the need to include the respective addressees. There is agreement in the emphasis on structure through headings and highlighting and that the font size is important. The directives are also almost in agreement with regard to the syntactic specifications: no long sentences, no long, multi-syllable words, short lists instead of longer paragraphs etc. The same applies to the vocabulary: no technical terms, no abbreviations, no acronyms should be used. None of the directives provide linguistic justifications for the recommendations, and there is no reference to any scientific or empirical evidence.

It is possible that the authors of the expert recommendation on lay summaries were aware of the readability directive for package leaflets. However, the readability directive is neither mentioned in the expert recommendations nor is it referred to in the works cited. It seems conceivable that both rule sets were developed independently. However, it seems almost impossible that the authors of the readability directive or the expert recommendations knew the rules for Easy Language, even though their predecessor ("Information für alle" of the International League of Societies for Persons with Mental Handicap, ILSMH) was developed in 1998. The similarity in the directives therefore seems to be an instance of real convergence. The attempt to achieve comprehensibility led from very different communication contexts to very similar standards regarding how this could be achieved linguistically. This shows that the recommendations for simplification are independent of the original communication intent and independent of the textual source material. At the same time, the observed convergence suggests that the simplification rules are mostly universal.

7 Conclusion and outlook

It was shown that complex medical and pharmaceutical information can be made available to laypersons, even if further efforts are necessary here. For both documents examined, the package leaflet for medicinal products and the summary of comprehensible findings of clinical studies for a lay audience, comprehensibility is to be achieved through a combination of legal rules, binding requirements regarding structure, adherence to writing directives and testing with the target group. The directives developed for writing these documents are in many respects consistent with the rules for Easy Language. This convergence underpins their usefulness in facilitating access to information on medicines and to improve understanding of medical and pharmaceutical relationships.

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Antje Baumann

Legal texts as barriers – characteristics of law texts and the question of comprehensibility

1 Text types associated with the language of the law

The language of the law uses many different text types: treaties, parliamentary protocols, verdicts, decisions, indictments, closing arguments, summons, oaths, testimonies, constitutional complaints, enforcement orders, reports, certificates, records (in land registers, registers etc.), legal opinions, commentaries on rulings, objections, laws, commentaries, orders, last wills, and many more (see e.g. Hoffmann 1997 and Busse 2000).

Due to the use of specialised language, all these text types differ from general language texts and are therefore considered or classified as difficult to understand outside of their specific domain, in this case, the legal domain. This also applies to texts written in other specialised language forms for other areas of expertise.

1.1 The text type 'law'

Within the variety of legal text types, the text type 'law' is one of a kind. The difficulty in understanding laws constitutes a particular obstacle, since laws – in contrast to other legal text types – pertain to the legal system and therefore can principally affect every citizen. If the difficulty in understanding laws was not only alleged (see Warnke 2004 on the stereotypical difficulty of understanding law texts), but could also be proven, it would be remarkably inconsistent with the significant meaning attributed to laws in a democratic society.

To qualify the difficulty of understanding laws, the following list presents characteristics of this text type, which are the result of practical experience in the linguistic examination of laws as part of the legislative process. From the

perspective of legislative editing, the following internal and external features of the text type 'law' are relevant:

1. Expert language
2. Institutionality
3. Multiple target readerships
4. Mixed authorship
5. Extremely high level of intertextuality
6. High level of formality
7. Tension between postulated precision and realised vagueness

Some of the individually mentioned features can also be considered a facet or result of specialised language. For example, every specialised text type is written with reference to other specialised texts, many of which are formal and some of which are bound to institutions. Every type of specialised language that uses natural language carries a contradiction between claimed precision and real vagueness of the language elements. Features such as intertextuality, formality, institutionality and tension between postulated precision and realised vagueness could be classified as subdivisions or results of the use of specialised language.

Therefore, the features mentioned above will be presented only with regard to their specific realisation in the text type 'law'.

On specialised language:

- In addition to specialised terms that German speakers can easily recognise as such (*accessarily, exequatur, pendency*), laws also contain many general language words that have other meanings in this context (*in principle, ownership, title, objection* etc.). The second group of words and terms is recognized and understood as specialised vocabulary only by experts of the respective area. Therefore, unfortunately, laypeople may think that laws are comprehensible precisely where they are not (see feature: multiple target readerships).

- What is more, professionally established, tacit references to other legal texts, such as definitions of terms used in other texts, literature with commentaries, case laws etc. are mostly invisible to laypeople (see feature: intertextuality).

➢ Laypeople barely recognise the specialised meaning of some words and terms because their status as specialised language is not signalled through constant marking (e.g. in the case of foreign words) and the entire meaning of these words and terms only becomes visible when used in various texts. Since the difference in meaning exists "only" in its use and is not visibly reflected in lexicography, laypeople may not be able to deduce the meaning of many legal terms or entire legal rules, or may do so only insufficiently. Therefore, the specialised language impedes the comprehensibility of these text types in a special way.

On institutionality:

- In the Federal Republic of Germany, the speech acts "to draw up a law" and "to enact a law" are associated with different institutions that a text (as a bill) needs to pass through and where the changes are applied before it becomes an act. Over decades, these institutions have established methods (often fixed written patterns or rules) to decide at which stages of these proceedings (see Busse 2000 or "Stitchwort Gesetzgebung. Von der Idee zum Gesetz" (Deutscher Bundestag 2016)), for what reason, with what authorisation, based on which pattern and by whom these texts should be edited (see feature: mixed authorship). These types of practices are specified in e.g., the "Handbuch der Rechtsförmlichkeit" (translation: Manual for Drafting Legislation) (German Federal Ministry of Justice and Consumer Protection 2008) or in the "Handbuch zur Vorbereitung von Rechts- und Verwaltungsvorschriften" (translation: Manual for Preparation of Administrative Regulations) (German Federal Ministry of the Interior, Building and Community 2012; see feature: high level of formality).

- As the origin of laws is tied to institutions, the texts of this text type become special speech acts: declarations create (linguistic, metalinguistic or non-linguistic) facts by naming them. Naming something makes it 'real' because the very act is regarded as valid by both speaker and listener due to institutional power (cf. Rolf 1997 74; 84). Through declarative speech acts such as laws, institutional realities are created, changed and abolished.

➢ Institutions are constitutive for the text type 'law': The institutional practices in their interactions (in the complex legislative process) significantly impact not only the manner in which laws are created (many authors who edit the draft according to political, temporal and formal guidelines by official order), but also simultaneously establish features of "finished" laws and the difficulty in understanding them. Because of this institutionality, laws gain "validity" and create a reality on which the assigned social meaning is based.
➢ The institutionality of this text type also limits the possibility to influence the comprehensibility of laws during their creation.

On multiple target readerships:

- Laws differ from other specialised texts, because their purpose is not only to facilitate effective communication between experts; instead, they are also read by laypeople in search of information about their rights and obligations. In a democracy, citizens must not only be able to understand the law in order to follow it, but also in order to accept it or introduce changes as sovereign voting citizens. The inherent double target readerships (experts and laypeople) of this text type significantly distinguishes it from other text types and creates tension between the target groups that have differing perceptions of its comprehensibility.
- Laws are often working tools not only for judicial experts but also for experts of many other fields because, apart from judicial experts, administrators of executive authorities who are familiar with the

respective special materials also deal with laws (e.g. the Federal Financial Supervisory Authority or German Federal Emission Control Act). Laws often contain elements of various expert languages (e.g. of finances or environmental engineering); therefore we can assume potential multiple target readerships rather than a double target readership.

➢ Due to the constitutive feature of multiple target readerships, the desired level of comprehensibility of the text type 'law' cannot be addressed to only one target group.

On mixed authorship:

- In the institutions, a bill is edited by the many people involved in the legislative process (often independently), whose scope for decision-making is often limited because they act on (official) order and are instructed and supervised accordingly. Of the many stages of editing, only few are publicly available, as most are exclusively carried out inside the respective institution. Therefore, the text type 'law' also has an unusual authorship.
- The mixed authorship within institutions results in a partial "obfuscation" of the text production process: The legislative process within the German federal ministries, the German Federal Assembly (Bundesrat) and the German parliament (Bundestag) is highly differentiated (however, in legal and political science, it is often used prototypically) and, for political reasons, only little ever reaches the public from within the different institutions that edit a bill before it is promulgated as a law.

➢ Without knowledge of the aspects of origin of these text types (mixed authorship and institutionality), comprehensible laws for laypeople can be achieved to only a very limited extent.

On extremely high levels of intertextuality:

- The German Federal Law now has more than 4,400 acts of law and ordinances with approx. 78,000 detailed rules. The entire legal system is a construction of thousands of individual legal norms that are connected in many various ways (cf. meaning of 'text' < lat. *textus*: 'network, webbing'). In this webbing, there are no individual legal norms, but every norm is interwoven with other norms and therefore can only be understood when linked.
- The textuality of the legal system is achieved with the help of many links: through references (within the same law, but also to other laws), through factual or systematic references, through references to definitions or clarifications in other texts, to previous editions, to so-called parallel norms (that are often worded identically). Furthermore, many adjacent text types refer to laws by quoting, commenting, interpreting or illustrating them (judgement, commentary, article in hand or text books etc.).
- The textuality of the text type 'law' as understood by experts is not comprehensible for laypeople until they start looking up key words or legal norms in (usually fee-based) juridical data bases such as the legal portals juris or Beck-online. Thanks to the numerous references (links), these produce an abundance of interconnected text types and information:
  - texts of case law (verdicts and orders of different courts),
  - commentaries (of various legal norms),
  - administrative regulations,
  - tools (like guidelines or maintenance tables),
  - articles in lexicons, hand books and professional journals,
  - press releases (like messages from the German Bundesrat, German Bundestag, federal ministries, courts and chambers),
  - other messages (like expert reports or inquiries) and
  - bibliographical references.

- Scientific law corpora have a different function and are usually equally inaccessible to laypeople (on the juridical reference corpora (ger. JuReKo) see e.g. Gauer et al. 2016: 129 ff.). In contrast to this, almost the entire current German Federal Law is accessible and freely available at www.gesetze-im-internet.de (a common project of the German Federal Ministry of Justice and Consumer Protection and juris GmbH), but contains fewer links.
- Many references in acts of law and regulations are invisible to laypeople. Although laypeople can theoretically follow an explicit reference to a legal norm (e.g. in accordance with §§ 22 to 24 of X article) this will not be the case for so-called tacit references. On the other hand, experts also establish systematic references to associations that they merely thought about in the process, because they know the field and its language "inside out". They think about connections that are not reflected in the language. For example, experts recognise a word (*theft, child support* etc.) as a specialised term and establish mental associations with other specialised terms and contents (*ownership, property, child support obligations* etc.) or they create mental connections between the general part of the law and other regulations of the same law or between the German Criminal Code and additional penalties not covered by the criminal code
- In addition to the interweavings of the legal system of the German Federal Republic (see also Lang in the present volume), there are also links to the legal systems of the federal states and the European Union.

➢ The special intertextual form of legal texts creates a comprehension obstacle for laypeople due to the extremely large number of links and text references that are not recognisable and go beyond the text (i.e. the respective law). Therefore, single phrases in laws cannot reveal their meaning in isolation and cannot be changed or made comprehensible when isolated.

On high levels of formality:

- Acts of law are based on conventionalised and standardised templates (so-called macrostructures) so that acts and ordinances are systematically structured and look alike. Furthermore, the internal coherence of the entire ordinance is preserved by the external form of single legal norms. In addition to recommendations that fundamentally affect the legal system and systematics (e.g. basic vs. amending legislation, influence of European law, international agreements etc.), the "Manual for Drafting Legislation" ("Handbuch der Rechtsförmlichkeit") specifies guidelines for formal composition of legislations, e.g. relations between units of structure (part, section, subsection, paragraph, subparagraph, sentence, number, letter etc.), how to define terms, where to find legal definitions and where and how the scope of application or commencement is regulated. Aside from the technical conventions, such as citation format, abbreviations, dealing with references, the guide also contains references to language and vocabulary use as well as spelling of numbers, fractions, amounts of money etc. in legislations.
- The use of (typo-)graphic elements is strictly regulated: brackets, slashes, quotation marks as well as highlighting (bold or italics, edge design) can only be used in very few and clearly defined cases.

➢ Legal guidelines exclude or greatly limit the use of several text elements that aid comprehension, e.g. illustrations, (typo-)graphic highlighting, variation of sequence of linguistic elements, redundancy, paraphrase. Due to the high level of formality, the comprehensibility of laws that, apart from their legal structure, can largely appear as general texts is limited.

On tension between postulated precision and realised vagueness:

- The tension between postulated precision and realised vagueness is typical for specialised language and also visible in acts of law. Pre-

cision is aspired to through definitions and legal definitions that often differ from general language use, with a structure that is legally defined, or with truly unambiguous references. Vagueness occurs because of undefined legal definitions, general clauses and discretionary standards.

- Tension is also created by the fact that, although every legal norm is subject to legal certainty, it cannot serve the application of the law without a certain indeterminacy. Legal norms need to "be able to breathe", i.e. they have to be written in a way that suits both new life situations and decision-making. Also "the fundamentally desired openness of laws to development contradicts the desire for general comprehensibility" (Beaucamp 2011: 29 f. ;English translation of the German original).
- Vagueness is characteristic for many expressions of natural language (e.g. *now, big, child, warmth*). This vagueness can be overridden or alleviated with substantiation, e.g. if a legally ruled general policy is clearer defined in a regulation or if *warmth* is so defined in a regulation that it means a specific temperature range and may even comprise coldness. The high art of the legislative process therefore entails purposely using linguistic elements of vagueness so that future developments in low rank legislation and possible doubts can be dealt with in case law (on "good" vagueness in the acts of law cf. Nussbaumer 2005).

➢ Since vagueness expressions are necessary in laws and laypeople are not able to distinguish them from unnecessary vagueness elements, these text features in particular inhibit comprehension.

Each of these characteristics limits the comprehensibility of the acts of law in its own way (more on these text features e.g. in Baumann 2015, more features of 'law' texts e.g. in Busse 2000). However, the combination of all the features specific to 'law' texts reduce comprehensibility significantly. A few features (institutionality, multiple target readerships, high level of intertextuality) cannot be changed; therefore, there is not much room left for the extensive editing of this mostly "fixed" text types in favour of comprehensibility.

At the same time, the legal language is considered theoretically well-researched. Studies of the interdisciplinary work group Legal language at the Berlin-Brandenburg Academy of Sciences and Humanities led, in 2004 and 2005, to the three-volume publication series "die Sprache des Rechts" (the Language of Law) that essentially presents the current state of research in the field of language and law. However, there are no links between theory and practice: Empirical research on the comprehensibility of legal texts is scarce (already older: Pfeiffer/Strouhal/ Wodak 1987; current: the cooperative project "Making law comprehensible" at www.bundesregierung.de/wirksam-regieren) and theoretical scientific findings are rarely applied in the real practice of the legislative process.

The only sporadic exchange of theory and practice in the area of the text type 'law' may contribute to the continuity in contradictory claims about acts of law (they are difficult to understand, although fundamental). It is assumed that the reason for the recurring claim that legal texts are difficult to understand is incomplete and out-dated knowledge of these specific text types on the part of both text recipients and producers. However, to improve the comprehensibility of 'law' texts, updated and popularised knowledge of text types is essential.

1.2 Ability to distinguish text types and comprehensibility

The ability to distinguish text types (text-type competence) is a pragmatic requirement for appropriate text reception and possible text production. To recognise a text as a representation of a text type means to also know its features and apply them for improved understanding. This competence impacts not only text reception, but also text production since familiarity with text features allows users to reproduce them according to the requirements of a communicative situation. Therefore, an ability to distinguish text types is required in order to understand a text.

The typological difficulties of classifying text types and classes based on certain features and feature combinations do not affect comprehensibility of the language of everyday life. (For a definition of text types see GROßE 1974 and Adamzik 2000 and 2008 e.g. the 3 "classic" models: matrix of different feature combinations Sandig 1972, classification based on text-internal and text-external factors [Linke e.g. 1994] and the communicative approach Brinker 2001].)

If most people in Germany recognise and understand a text as e.g. a weather forecast, recipe or letter, it will be, among other reasons, because these texts are widespread in this language community and have remained more or less stable over a long period. A competence in terms of these text types is developed through a constant confrontation with these kinds of texts. In the case of text types that are less incorporated into the daily life of most people, the corresponding competence will diminish. Therefore, it is sometimes difficult to recognise a poem, to differentiate between an election advertisement and a newspaper advertisement or to identify a notification about a prize as an advertisement.

Since the knowledge of text types is acquired through linguistic activity, which in turn is linked to a changing extralinguistic reality, a petition today looks different than in the Middle Ages, we receive messages from the other end of the world quicker and via different channels, and nobody writes a "brigadier's diary" anymore. Text types change – some of them disappear, new emerge – and with changing linguistic activities the ability to distinguish text types also changes.

1.3 Little knowledge about the specific text type 'law'

In the case of some text types, knowledge thereof is not in line with attributed importance: Laws are fundamental for our society because they "regulate" the co-existence of humans, i.e. they describe rights, obligations, claims, responsibilities etc. of different players as well as requirements, admissibilities and consequences of certain actions as legal norms. The legal regulations (legal norms) are essential for effective relations between the players. In terms of Weisgerber, the world is "worded" (English translation of the German original), i.e. (part of) the world is expressed in words, verbalised; reality is captured and organised by verbalisation, reality is created with language (Weisgerber 1962). Passing a law is a declarative "act" of speech that establishes a certain state in the course of the conventional procedure (of the legislative process). When a law comes into force, single regulations including commencement and transitional regulations trigger substantial effects.

Laws have effects in the world and are considered fundamental for our co-existence. Nevertheless, knowledge about this text type is under-developed. We should have as much knowledge of them as we do of other powerful acts of speech such as verdicts, marital vows, declarations of war and love, shouldn't we?

2 Comprehensibility of laws in democratic societies

If the ability to distinguish text types is considered a precondition to understanding (in the case of laws it does not mean a reproduction of content, but adjusting one's conduct according to one's understanding of the content, following it, changing it etc.), insufficient knowledge about legal texts leads to incomplete understanding of laws – with consequences for individuals as well as the functioning and self-conception of an entire society.

Therefore, we must not be content with simply complaining about the incomprehensibility of laws. This has already gone on for too long (since the first law was passed) and so far, laws have hardly been made more comprehensible (see e.g. Lerch 2002 on different efforts in different countries). For example, more than 200 years ago, Austrian empress Maria Theresa wanted to have comprehensibility verified by a "stupid person". The idea was to present all the new legal regulations to the "buta ember" (Hungarian). If those simple people, who did not have any legal knowledge, were not able to understand the meaning, the draft was to be edited by the ministerial administration (cf. Lerch 2004: 237). – However, the idea of the empress was not successful.

In a democracy, the comprehensibility of laws is a precondition for the preservation of these structures; therefore, comprehensibility needs to be assured or generated by other means.

Therefore, at the federal level, in the Joint Rules of Procedure of the Federal Ministries (GGO), there is a **German comprehensibility precept (Verständlichkeitsgebot)**:

> "Bills must be correct in terms of language and as comprehensible as possible for everyone". (§ 42 subsection 5 GGO; English translation of the German original)

The German comprehensibility precept (Verständlichkeitsgebot) derives from the intended efficiency of the law and the aforementioned democracy principle, since incomprehensible law remains ineffective and the people, as sovereign citizens, can only master laws, i.e. abide by, enforce and change them if they understand them. Furthermore, the precept derives from the rule of law, according to which

exercise of all state authority is bound by the law. This is to prevent state arbitrariness and grant citizens their fundamental rights (prohibition of arbitrary decisions). However, government or administrative actions can only be managed or limited with valid acts of law if they are sufficiently determinate (legal certainty).

Acts of law that are difficult to understand cause mistrust in law and state or at least distance to both; incomprehensible acts of law tend to be a danger to the state.

2.1 Who would benefit from comprehensible acts of law?

According to the German comprehensibility precept (Verständlichkeitsgebot), acts of law should be as comprehensible as possible for **everyone** (see above). Distinguishing between professional practitioners and laypeople, however, is fundamental since there is a difference between a judge, lawyer or jurist finding a precept hardly comprehensible and laypeople without a legal education who want to understand a law or passage thereof to exercise their civic rights and duties or because they are affected by it. Nowadays, both practitioners and laypeople have difficulties understanding German laws. Diagram 1 shows who deals with laws and to which purpose.

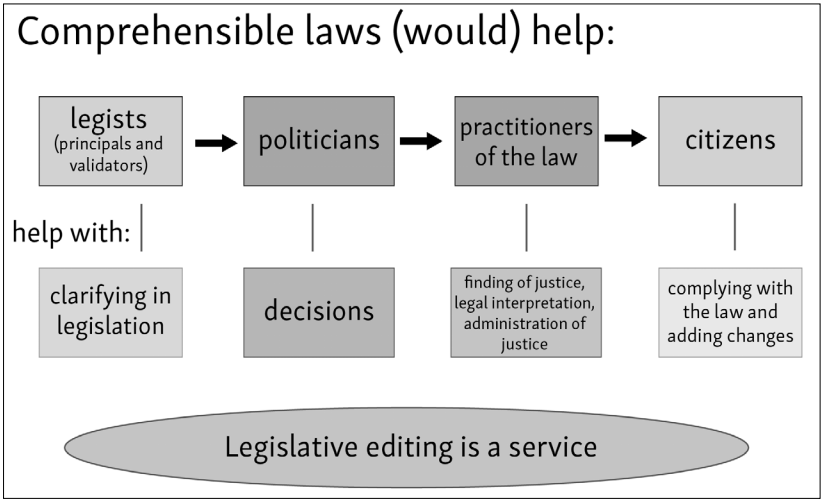

Figure 1: Who profits from comprehensible laws? (source: A.B.)

In the legislative process, legislators and politicians benefit from a comprehensible draft. They allow the former to better formulate the law in a way that is politically desired and the latter can make better decisions on new laws. After promulgation, comprehensible acts of law are useful for everybody who adjudicates, interprets and helps to "translate" them, as well as for enterprises and citizens who want to act within the law or inform themselves. Therefore, more comprehensible acts of law would simplify work or access to justice for both practitioners and laypeople.

Therefore, legislative editing and comprehensibility assessment are a service to democracy: Initially, trust, time and money are required, but in the long run, it also saves time and money and builds confidence in politics.

This is also shown in the satisfaction survey of 2015 carried out by the German Federal Statistical Office on behalf of the German Federal Government in which private individuals and enterprises were asked about their experience with the legal system, laws and administration in different situations: While citizens are essentially satisfied with the services of state administration in all circumstances, comprehensibility (of forms and applications and underlying law) received the worst results of 16 different aspects of state service provision (detailed documentation of survey at www.amtlich-einfach.de).

For the German Federal Government, a tool for achieving more comprehensible acts of law is legislative editing as a part of the legislative process.

2.2 Language assessment in the legislative process as part of the drafting process

The legal basis for the language assessment is the above-mentioned § 42 subsection 5 sentence 1 of the German GGO. Before they go to parliament, all new laws and regulations have to be checked in a legal scrutiny procedure which also includes language assessments. This legislative editing (including language consultation) is performed in the German Federal Ministry of Justice and Consumer Protection by linguistically educated experts and is available for the entire legislative process:

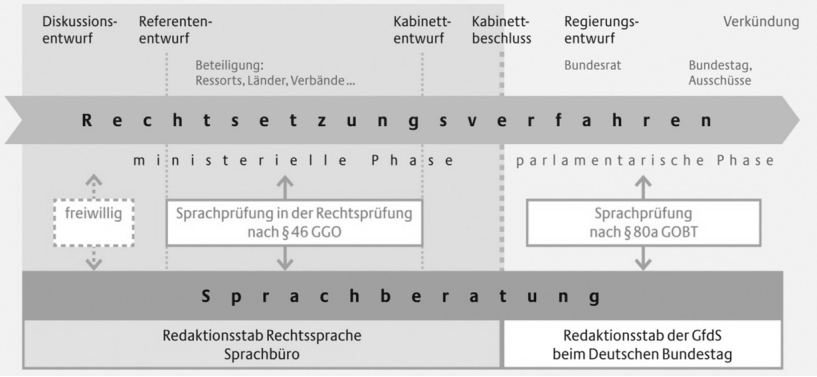

Figure 2: Legislative editing or language consultation during the legislative process in German law (Source: German Federal Ministry of Justice and Consumer Protection)

Language assessment is part of the legal scrutiny procedure regulated by § 46 of the German GGO and therefore mandatory (during the legal scrutiny procedure, every draft is checked in terms of whether it systematically, legally and linguistically fits into the existing legal system). In the early phase, language assessment is optional. Ideally, it should take place several times and is more effective the earlier it begins.

But how can experts assess a draft within the complex legislative process not only for linguistic accuracy but also for comprehensibility?

Since comprehensibility is not an absolute value and also not a mere text characteristic but always exists in reference to a respective recipient, the different focus of the various experts involved in the legislative process is purposely harnessed insofar as these experts talk to each other with the aim of creating a text that is also comprehensible to non-experts. Ideally, with the help of a legislative editor, the various expert languages (in addition to the legal language e.g. also aviation, finance, environmental technology language etc.) are balanced in such a way that the draft is also comprehensible to the respective non-experts or citizens. This adjustment process can only be successful through co-operation and communication as part of the written and oral editorial work.

Thanks to their linguistic training and experience in the legislative process, the legislative editors can take on the role of mediators. They know that various subjects and their respective terminologies and usages may come into contact

with each other. In editorial meetings, they communicate this to the various experts involved in the drafting of the law, who, as representatives of the German Federal Ministry in charge or as the person responsible for conducting the legal scrutiny procedure in the German Federal Ministry of Justice and Consumer Protection respectively, have a different perspective on the emerging legislation.

Working on the language raises content-related questions that have not yet been discussed by the legislators. This may concern the usage of the terms (e.g. is the same thing named differently – and thus violates a judicial and legal principle?) or questions regarding the structure (is the regulation in the right place, does it fit under this paragraph heading or does this heading still fit after the paragraph has been amended and extended?) and other questions. The language assessment draws attention to classic mistakes ("review on linguistic accuracy"), but its main purpose is the comprehensibility assessment. This is why questions created by rewording often also concern the areas of logic, coherence and certainty of rules: Is an exception clearly identifiable as such or incorrectly placed as a reverse exception? Which recipient should be addressed by the respective legal rule – does, for instance, the actor of an official act need to be named or is the actual action paramount? The respective legislative project is thus systematically reviewed for all sorts of inconsistencies and thus put to the acid test, so to say – from the linguistic surface to judicial questions. Since these questions may be legally relevant, their solving requires the cooperation with legal experts.

As with sparring in sports, the legislative editors point out deficiencies of the draft and – in cooperation with the other experts – reinforce its strengths. However, such cooperation requires communication which is anchored in the legislative process and based on partnership. During the reform of the pension adjustment order in 2008, the linguists asked, for instance, whether the term *pendency* was really necessary as a specialised term – because this specific regulation for the clarification of retirement benefit rights after a divorce should also be comprehensible to laypeople. Until then, § 1587 subsection 2 of the German Civil Code (BGB; English translation of the German original) said: *"According to the legal provisions on pension rights adjustment, the period of marriage is defined as the period from the beginning of the month in which the wedding took*

place to the end of the month preceding the decisive moment for pendency of the divorce petition." The discussion with jurists in the German Federal Ministry of Justice and Consumer Protection resulted in the term being solvable in this case and thus § 3 subsection 1 of the German Pension Sharing Act now says: *"According to the law, the period of marriage begins on the first day of the month in which the wedding took place; it ends on the last day of the month preceding the service of the divorce petition*" (emphasis AB; English translation of the German original).

Therefore, the legislative editors think deeply about the draft and give advice on which changes (often small, but sometimes fundamental) could make the text more comprehensible. At the same time, they consider not only the professional practitioners who later have to apply the law, but also the citizens in order to make their access to the law as easy as possible. And they have made the motivating experience that their work – freeing the text as much as possible from elements that impede its comprehensibility and strengthening elements that support its comprehensibility – benefits both experts AND laypeople (on the work of legislative editors e.g. Nussbaumer 2002; 2009, Baumann 2012).

2.3 New paths to more comprehensibility in the "fixed" text type 'law'

The specific bundle of partly unchangeable text type characteristics (see above) leads to laws being considered difficult to understand and allows for only a narrow framework within which it is possible to work on comprehensibility. In order for laws to still be understood by both professional practitioners and juridical laypeople, further instruments – besides legislative editing during the legislative process – are required that ensure or enable the comprehensibility of laws.

2.3.1 *Before* the legislative process: linguistic training while studying law

Law exists in language. Those who want to apply the law in their profession have to professionally master language as their main future work tool. Jurists, as professional practitioners, are the experts who implement law, impose

law, in reality "translate" law, who dispense and set justice. In doing so, they more or less have to explain the verbalised law to other experts, but also to juridical laypeople. A lawyer might need more explanatory speech acts than a judge – however, in all legal activities, the use of language is relevant in a completely different way than in other professional fields that have also developed a specialised language that differs from the general language. Pharmacists, for instance, only need small parts of their specialised language when they communicate with laypeople, e.g. patients, customers or journalists who have no or only very basic pharmaceutical knowledge. Also, contact between experts in finance, astrophysics or molecular biology and laypeople who want to understand texts from these fields is most probably limited.

Since the legal language and in particular the language of the laws has so many characteristics that distinguish it from other expert languages, these special features should be brought to the attention of future lawyers in their university education. With the text type 'law' and the comprehensibility of laws, not only linguistic questions regarding comprehensibility and expert language research but also sociological questions would become subjects during the study of law.

2.3.2 *In* the legislative process: school of legal technicality

Since the legislative process is complex, national legislation is embedded in the set of EU regulations and the situations that are to be regulated are complicated, the operators (legislators) in the legislative process must have a wide range of skills and knowledge in order to meet the requirements of today's legislation practice. Currently, however, legal skills and knowledge are only acquired in the legislative work of the German Federal Government and the parliament. The German Federal Government has therefore initiated a qualification campaign to build a school for legislators, in which future writers of draft laws should learn skills for drafting comprehensible legal texts (Bessere Rechtsetzung 2016: 16).

2.3.3 *After* or *during* the legislative process

Legal-linguistic and sociological research must accompany the legislative process in order to make even "difficult" texts like laws understandable despite their limitations (see Fix 2017). If such research results were to have an impact on practice and at the same time lead to popularised knowledge on the legislative process and the text type 'law', those who make "finished" laws more comprehensible – for specific target audiences and by various means – would also benefit. In this way, questions on certain legal matters (and laws) could not only be mediated via brochures and websites in a way appropriate to the target audience, but, for instance, also be translated into Easy Language.

3 Conclusion

Since the text type 'law' in particular has characteristics that limit comprehensibility, the linguistic formulation of the law is a potential barrier. The translation of the law into the daily life of people with various needs, skills and limitations has to be improved

- through new ways of making the fixed text type 'law' more comprehensible (in addition to legislative editing),
- through political education, which popularises the obligatory comprehensibility obstacle of the text type 'law' that is relevant to the citizens (e.g. through events such as "MACHT POLITIK SPRACHE … verständlich? Kann man Gesetze und Amtsschreiben 'leichter' machen?" ("DO POLITICS MAKE LANGUAGE … comprehensible? Can laws and official letters be 'simplified'?") as part of the German "Initiative DEUTSCH 3.0" of the Goethe-Institut), and
- through professionalising the involved actors (e.g. in a school for legislators and in the Master's programme Accessible Communication) through a greater exchange between science and practice.

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Franziska Heidrich-Wilhelms

Technical communication between experts and non-experts as a barrier

1 Introduction

This article explores the reduction of barriers in the context of specialised communication, in particular in *technical* communication. The pronounced heterogeneity of the target group (see Section 2) makes the reflection on these barriers, or rather on *accessibility* in the context of technical communication, particularly difficult. While research on *accessible communication* usually focuses on target groups with specific communicative impairments, the framework can be somewhat expanded here: In communication between experts and non-experts (laypersons), technical communication per se already constitutes a communication barrier, which is even greater for target groups with special needs. This article deals with the barriers that all non-expert target groups of technical communication face – regardless of specific communicative impairments.

2 Technical communication

Specialised communication comprises "targeted, informational, monolingual and multilingual oral and written communicative acts of specialised content that make use of optimised means of communication and that people use while performing their professional activities" (Schubert 2007: 210; English translation of the German original; see Hoffmann 1976/1987, 1998; Fluck 1976/1996; Roelcke 1999/2010; Rothkegel 2010). Specialised communication is often controlled by conscious interventions and aims at "explicating, communicating and building knowledge" (Schubert 2007: 142; English translation

of the German original). It is characterised by its relationship with specific knowledge domains (Rothkegel 2010: 248). Technical communication is the communication about technical content. It is at the content level of the *technical subject* that technical communication is distinguished from other domains (Krings 1996: 10 ff.; Rothkegel 2010: 9). Technical communication includes both oral and written communication processes. An essential field of work lies in the written communication processes of technical communication and thus essentially in *technical documentation*.

Technical documentation comprises various documents on technical products (and services), which are created in parallel to the creation and life cycle of a product (product life cycle). A document is "a fixed oral or written text including any non-linguistic components that can be accessed as often as desired and at any time" (Schubert 2007: 7; English translation of the German original; following Krings 1996: 12; DIN 6789-1 1990). By contrast, documentation is the "sum of all documents compiled for a specific purpose" (DIN 6789-1 1990; English translation of the German original). These documents contain product-related data and information for various purposes, they are structured, they can be made up of oral or written communicative acts, they are non-volatile and always function-oriented (see Krings 1996: 9; VDI 4500 – Sheet 1; Juhl 2005: 14 f.). The focus is often on the ability to perform subsequent actions (Juhl 2005: 15). By analogy with the mentioned product life cycle, there is also a so-called information life cycle. The information life cycle can be divided, for example, into the phases of creation, compression and use, storage and archiving (Thome/Sollbach 2007: 30). In technical communication, the information life cycle is often considered to run in parallel to the product life cycle or rather alongside its phases (tekom 2018).

Technical communication exists in various forms and is therefore expressed in different text types, which in turn are subject to different text type conventions. Göpferich (1998a: 90 ff.) presents a very comprehensive spectrum of text types that will serve as a basis to portray the target groups of technical communication in this article:

- Legal normative texts create a legal basis. These texts are linked with claims or are used to achieve standardisation.

- Progress-oriented research texts are intended to advance science and technology.
- Didactic-instructive texts disseminate "the current state of knowledge for the purposes of intellectual enrichment and practical application" (Göpferich 1998a: 91; English translation of the German original).
- Knowledge-compiling texts provide an overview of the knowledge that is being conveyed in the other text types.

Along the continuum of specialised text types, the degree of specialisation decreases gradually while, at the same time, the number of addressees increases (Göpferich 1998a: 91). This occurs gradually because the specialisation of texts cannot be evaluated in a strictly delimited way as a clear dichotomy in the sense of 'expert vs. non-expert' does not exist. Instead, a text's specialisation can be evaluated on a "sliding scale, whereby the scales range from '(extremely) rich in features' to '(extremely) poor in features'" (Hoffmann 1998: 163; English translation of the German original).

Accordingly, target groups can be categorised. Technical communication takes place between experts of the same domain, between experts and non-experts, and in interdisciplinary contexts (between experts of different domains) (Möhn 1977: 314; Möhn/Pelka 1984). When a text is produced that is intended for communication between experts of the same domain, it can be assumed that both the producer and the recipient have the same expert knowledge and expert language skills (Stolze 1999: 126 f.). In the case of texts that are produced for communication between experts and non-experts, it can be assumed that neither the expert knowledge nor the expert language skills of the producer and the recipient are identical; therefore, an expert language barrier occurs that has to be overcome and, in addition, knowledge has to be transferred to the addressees (ibid. 131). Interdisciplinary communication between experts from different domains also poses special challenges for text producers: It requires expert skills as well as communication competence, which include making implicit knowledge explicit and presenting it in a way that is appropriate to the addressees (Jäger 1996: 74 f.; quoted in Janich 2012: 13).

With regard to adapting to the target group in the context of technical communication – an act that generally requires a reduction of barriers (see Rink in this volume) – the characteristics, requirements and prerequisites of an intended target group must first be analysed. Here, the expert knowledge as well as the expert language competence are determined. For application-related end-user documentation (instructions for use etc.) in the context of communication between experts and non-experts, it usually has to be assumed that the addressees have no expert knowledge at all and that therefore they also have little expert language competence.

3 Barriers in technical communication

Barriers are to be understood here as obstacles in a figurative sense that impair communication. Therefore, the following section will focus on *communication barriers* that exclude people from communicative acts. These barriers can be divided into perception barriers and comprehension barriers (Schubert 2016: 18 f.; Heidrich/Schubert 2017: 39). While in the case of a perception barrier, one of the human senses does not work and a linguistic message that addresses this sense cannot be perceived, the comprehension barriers refer to messages that can be perceived by the senses but are not understood (Heidrich/Schubert 2017; Heidrich 2018, 2019). Many barrier types occur in all areas of society when people are unable to participate in communication either entirely or sufficiently, e.g. due to insufficient language skills, cognitive impairments etc. Thus, all types of communication barriers can also occur in the context of technical communication, especially in communication between experts and non-experts. However, in technical communication, barrier types occur that are very specific to this area of communication – even for recipients without special needs.

In the legal assessment of technical documentation, barriers that may occur are already implicitly addressed. For example, the EC Machinery Directive not only stipulates that a machine must always be accompanied by instructions for use, but that it must also be available in the official language(s) of the country in which the machine is to be put on the market (Directive 2006/42/EC). Thus, a

comprehension barrier is already indirectly addressed, because if recipients do not understand or do not sufficiently understand a document due to a language barrier, a communication barrier exists. The German Product Liability Act (Produkthaftungsgesetz ProdHaftG) also implicitly addresses communication barriers in technical documentation. According to this Act, "incomplete, faulty, ambiguous or incomprehensible presentation of the product" in the technical documentation already constitutes a lack of product safety (ProdHaftG 2015; English translation of the German original). Here too, non-compliance leads to a comprehension barrier. In accordance with the classification of communication barriers into sensory barriers, expert knowledge barriers, cultural barriers, cognitive barriers, language barriers and expert language barriers (Schubert 2016: 17–19; Rink in this volume), in technical communication mainly expert knowledge barriers and expert language barriers and, therefore, comprehension barriers according to the above categorisation occur.

Expert languages are characterised by the linguistic features of information compression and anonymisation. The degree of expert *language* of texts correlates with the sliding scale of specialisation described above, because expert language cannot be simply considered the counterpart of standard language. The degree of abstraction of the extra-linguistic presentation, the author's expert knowledge, the knowledge assumed among the addressees as well as the text function all provide indications for the degree of specialisation of a text (Stolze 1999: 24). Characteristics of expert languages include the dominance of specialised lexis, absence of affective and evaluative words and phrases, absence of dialogical parts and a tendency towards scarcity of expression (Fluck 1976/1996: 47 ff.). The efficiency of statements is particularly important (Stolze 1999: 94 ff.).

The comprehensibility of specialised texts is not just a characteristic at the intrinsic text level; it also depends on cognitive and motivational characteristics and on the knowledge requirements of the recipients who in turn influence the text (Groeben 1981; Groeben/Christmann 1989: 168; Christmann 2004: 33 f.; Antos/Hasler/Perrin 2011: 643). However, elements that promote and inhibit comprehension can also be identified at the intrinsic text level. Comprehensibility is supported by content-related, visual and linguistic factors (Lehrndorfer 1996a: 339). A comprehensible text should

essentially be structured in an action-oriented manner, be simple, uniform, unambiguous and complete (Heidrich 2016). Means of visualisation or rather their interaction with the text as well as a supporting macro-typography, a continuous access structure and the arrangement of the text parts also contribute to comprehensibility (Sauer 1995, 1997). Motivating the recipients is also considered to be among the fundamental elements of comprehensibility (see Groeben 1972; Langer/Schulz von Thun/Tausch 1974/2006; Göpferich 2001, 2002/2006), which include, among others, examples and illustrations. The knowledge that is being conveyed, the text design and the medium should be adapted to the prerequisites and requirements of the addressees (Göpferich 2001, 2002/2006). In summary, comprehensibility features of specialised texts at the intrinsic text level can be labelled with the superordinate aspects of correctness, readability, structure, completeness, uniformity, unambiguousness, simplicity and brevity (Heidrich 2016: 185 ff.). However, these aspects of comprehensibility are largely in contradiction to the characteristics of technical expert language that are briefly outlined above. In particular the aspects of information condensation, which are important for the efficiency of statements, and the grammatical means that are associated with these aspects hinder comprehensibility and create another comprehension barrier that originates from the text.

A comprehension barrier is not only present in the communication between experts and non-experts and in the interdisciplinary communication between experts from different domains. Comprehension problems can also be identified in the communication between experts of the same domain. In this case, these comprehension problems are not due to the expert language barrier or the expert knowledge barrier, because in communication within the same domain, it can usually be assumed that the producer and the recipient have the same level of expert knowledge and use the same repertoire of signs in the expert language. Here, a comprehension barrier is created when the linguistic expression is too complicated, ambiguous, incomplete etc.

4 Accessible technical communication

In accordance with the barrier types identified above in the context of communication between experts of the same domain, between experts of different domains and between experts and non-experts, various methods to reduce these comprehension barriers can be identified. The reduction of barriers or rather the *optimisation of specialised communication* can be realised within the text by, for example, standardising terminology, syntax and linguistic style or by developing macro and micro structures in a planned approach (see Baumert 1998/2010; Göpferich 1998b; Schubert 2001: 225 ff., 2007: 330; Strohner/Brose 2002/2006; Drewer/Ziegler 2011).

In addition to standardising terminology (both within and -across companies), so-called *controlled languages* have become established with regard to the control of linguistic expression (so far largely limited to single branches). By means of controlled languages the language system itself is controlled. The freedom of lexical and/or syntactic choices is systematically restricted. Due to these types of regulation, they address the comprehension barrier in specialised communication and are practically only applied in this area. The aim of older controlled languages, e.g. *Caterpillar Fundamental English*, originally was the omission of all translations within the same domain with the help of significantly increased comprehensibility for non-native speakers, although this aim has demonstrably not been achieved (see for example Kirkman/Snow/Watson 1987: 160; Lehrndorfer 1996a, b; Kamprath et al. 1998: 52). Present-day controlled languages, e.g. GIFAS *Français Rationalisé* or ASD *Simplified Technical English*, have, however, become established as an alternative to the native language and are intended to express content in a simpler, clearer and more consistent manner than natural language. In this way, they are conducive to comprehensibility in communication between experts and non-experts and in communication between experts of the same domain and also to translation-friendliness in human, machine-supported and machine translation (Lehrndorfer 1996b: 13; Göpferich 1998a: 288 ff.; Schubert 2007b: 124 ff.; Drewer/Ziegler 2011: 206 ff.; Heidrich 2016: 125 ff.).

Controlled languages as simplified variants of a natural language are intended to simplify communication between experts as well as communica-

tion between experts and non-experts by reducing the complexity, ambiguity, scope and redundancy of natural language (Ley 2005: 27). Therefore, specialised texts designed according to the principles of a controlled language are easier to understand for both experts and non-experts. Established present-day controlled languages include ASD Simplified Technical English and GIFAS Français Rationalisé (see GIFAS 1996/1999; ASD 2013, 2017). Both controlled languages are used in the aviation, space and defence industries. Their *raison d'être* is that in these generally highly regulated industries with very high security requirements, the comprehensibility of communication within the same domain is of particular importance. Thus, the principles are applied, for example, for internal communication between departments such as research and development (R&D) and, e.g., maintenance (see for example Lehrndorfer 1996a, b; Schubert 2001, 2007, 2008). The desired increased uniformity and disambiguation are achieved by standardising lexis and syntax and therefore by creating consistency. Controlled languages are based on a reductive transformation of natural languages; i.e., the phenomena of natural language that negatively influence the comprehension process are excluded without creating new linguistic phenomena. Specifically, this means that the stock of morphemes and lexemes and the possibilities for word formation and syntactic means are reduced. In many cases, the lexemes are fixed to one word class and ambiguous syntactic constructions are replaced by unambiguous ones (Schubert 2001: 230, 2008: 211; Ley 2005).

ASD *Simplified Technical English*, as the most widely established controlled language for English, contains not only writing rules but also a dictionary of admissible words that follows the principle of unambiguity. Unambiguousness, in this context, means that both synonymy and homonymy are excluded. Each term has a single designation and each designation corresponds to a single term. The writing rules refer to word usage, nominal phrases, verbs, sentence formation etc. The words that can be used according to the dictionary may only be supplemented by domain-specific terms (ASD 2013; Simplified Technical English Maintenance Group 2015).

When using a controlled language, deliberate control takes place at the level of the language system. This results in a high degree of sustainability for all future documents. The increased lexical and syntactic consistency of

controlled languages compared to uncontrolled language also promotes the efficient applicability of content management systems. At the same time, the aforementioned consistency and disambiguation leads to improved translatability and more efficient use of translation management systems (Kirkman 1983: 9; Kirkman/Snow/Watson 1987: 160; Lehrndorfer 1996b: 13; Göpferich 1998a: 288 ff.; Schubert 2007: 124 ff.; see Zehrer in this volume). Disadvantages that are often cited include the initial effort, the complex sets of regulations and a difficult learning curve, which then also leads to an assumed low level of acceptance (see Lehrndorfer 1996a, b; Schubert 2001). With today's software support systems, however, some of these disadvantages are offset, because regulation compliance can be automated and checked by these systems during the creation process.

In the context of specialised communication, *information structuring* describes standardisation methods that aim to present information in a structured way at a text or text part level. This generally includes techniques that enable technical writers to structure documents in such a way that they are easier to understand. This means that the document creation process is controlled at the level of text structures. The resulting typified information units simplify production and reception of documents. Information should therefore be easily found in the document and should also be easily identifiable according to its information type. The function of information is presented in a recognisable way and wordings are designed accordingly.

The *Functional Design* method, as an information structuring technique widely used in technical writing, is intended to simplify documents for recipients in accordance with the structuring of information (Lehrndorfer/Tjarks-Sobhani 2001; Schäflein-Armbruster 2004a, b, c, d; Muthig/Schäflein-Armbruster 2008). In essence, this technique is based on the structuring and standardisation of documents at all levels. This technique was originally developed for technical documentation and is based on linguistic findings. On the basis of the method, specific in-house standards are developed which make the method very flexible in its application (Schäflein-Armbruster 2004a: 1–46). The functional-communicative approach of Functional Design is based on the speech act theory (Schäflein-Armbruster 2004a, b, c, d; for speech act theory, see Austin 1962/1992; Searle 1969) and applies the postulate that speaking is

always acting to technical documentation. According to this, in technical documentation speech acts are carried out and serve a specific purpose (Muthig/Schäflein-Armbruster 2008: 43). The permissible speech acts for each document type as well as the consistent use, sequencing and design of these speech acts are specified. Documentation shall systematically consist of functional elements and each of these elements shall be consistently defined. For this purpose, the basic principle stating that each utterance has a function and a content as well as an optimal position within the document and a specified internal structure, wording, marking, typography and layout, applies (Schmeling 2009: 34).

The structuring of documents and of documentation (for a differentiation see Section 2) is based on four hierarchical levels: the *information products*, the *sequence patterns*, the *functional units* and the *labelling elements*. All four levels are structured and standardised according to the basic principles described above, with the functional units forming the core of Functional Design. At this level, each communication act within documents or within documentation is assigned a defined communicative function; here, the functional unit essentially corresponds to a speech act. For each functional unit, its function, its arrangement within the document, its internal structure and wording as well as its labelling are defined (see Schmeling 2009: 27). The interaction between the labelling of the individual functional units results in a transparent document structure and enables selective access to the text (Muthig/Schäflein-Armbruster/Schmeling 2014: n. pag.). For each type of information product, the permissible functional units are defined, the arrangement of which can in turn be specified in the form of sequence patterns. This is particularly useful when functional units frequently occur in an information product in a recurring sequence. At the level of the labelling elements, the *labelling* of words or groups of words that do not form an independent communication act in the sense of the functional units, but which need to be labelled differently, is regulated. Here, the presentation of display texts, menu paths and buttons, for example, is defined (Schmeling 2009: 30).

The structure and standardisation achieved by the functional design results in documents that are structured and designed in a consistent and functional way, which, in turn, results in low-threshold access and increased compre-

hensibility of the document. By structuring information in accordance with Functional Design, the comprehension barrier outlined above is therefore addressed. A comprehension barrier that, regardless of the target group, is assumed to be at the inherent text level and that is caused by complicated, ambiguous and inconsistent structuring and wording can be overcome in this way.

If a product overview is to be achieved within technical documentation or if instructions in technical documentation are to be understood more easily, it makes sense to support this aim by *using images*. The image is defined here using the broad term "non-linguistic forms of visual communication" (Ballstaedt 2005/2006: 3; English translation of the German original). Functions of images in technical communication include the visualisation, spatial orientation and compression of information. Individual aspects of an object can be emphasised with the help of images, the exact placement of partial products can be represented simply, and complex objects can be reproduced in a simplified way through abstraction (Ballstaedt 1996: 192 ff.; see Villiger 2017: 316 ff.). In order for the use of images to fulfil these functions, an interplay between text and image must be ensured; e.g. by making a textual reference to the image (Ballstaedt 2012: 138). In this case, text and image are often congruent and thus represent the same terms (ibid., see also Alexander in this volume). This creates a redundancy of terms and content that promotes comprehension and thus reduces the comprehension barrier (Maes/Lenting 1999: 101). In the complementary interplay of text and image, however, different terms are connected with each other and facts presented in the image are further explained in the text (Ballstaedt 2012: 139). If text and image are collocated in an elaborate way, they activate different terms, which the recipients have to resolve by drawing conclusions (ibid.). However, this process results in an increased cognitive load for the recipients (see also Villiger 2017). The placement within the documentation as well as the textual reference to the image depend on the classification of the leading medium (Villiger 2017: 318). It is by no means always the text that serves as the leading medium, and the way in which the text and image interact also shows considerable differences, sometimes even within a single documentation (ibid.). In instructive (parts of) texts, for example, using the image as the leading medium can be more helpful because it can be processed

more easily. However, this does not mean that the text can be foregone entirely (Maes/Lenting 1999: 101; Ganier 2004: 22 f.; Villiger 2017: 318 f.).

When using images, comprehension problems can occur in the same way that they can occur when only using text. The addressees must first understand what is being depicted and what the function of that depiction is. If this is ambiguous, comprehension problems arise (Ballstaedt 2005/2006: 31 ff., see Alexander in this volume). Further limitations arise, for example, from the way in which text and image are arranged in relation to each other. Image and text can only be efficiently used together if they are in close proximity to each other (Ballstaedt 2005/2006: 41, Bredel/Maaß 2016: 282 ff.). If the relationship is congruent, both must be clearly referenced and designations in text and image must correspond to each other. Elaborative relationships between text and image should be avoided altogether, because they could overburden the recipients (Ballstaedt 2005/2006: 41 f.). The textual reference to an image can be realised in the main text, with an image title, in a key or with captions (Ballstaedt 2005/2006: 42). Ballstaedt suggests that "a didactically well thought-out combination of image and text exploits the strengths of both codes and should be the optimum for most problems of technical communication" (ibid.: 44; English translation of the German original).

Supporting texts with the help of images or rather the well thought-out combination of both forms of presentation can thus, just like the controlling interventions described above, considerably reduce comprehension barriers in specialised communication.

5 Conclusion

Barriers in technical communication can be caused by various factors. As explained above, all types of communication barriers can occur in technical communication. However, the barriers specific to specialised communication are those that arise from a lack of expert knowledge that is necessary for comprehension, from a lack of expert language competence and from increased linguistic and textual complexity. Through controlling interventions, an attempt is made to reduce comprehension barriers in technical communica-

tion. Three of these interventions have been briefly described here. Controlled languages intervene in communicative acts at the level of the language system and thus permanently reduce their complexity, ambiguity and inconsistency. The techniques of information structuring intervene in text production both at the level of the text structure as well as at lower levels and aim primarily at the uniformity and unambiguity and at the low-threshold access structure of (complex) documents. Supporting communicative acts by using images or rather the mutual support of text and image serves to further reduce barriers with regard to the supporting explication of complex issues.

Target groups with specific requirements in terms of the reception of texts are often not yet considered neither in Specialised Communication Studies nor in professional practice. Since technical communication already faces the challenge of preparing the content of a specific domain for a very heterogeneous target group, it is already particularly difficult to make it comprehensible for non-experts. Designing technical content for non-experts, who have greatly increased demands regarding the comprehensibility of texts and documents, is a challenge that science and practice have not yet (sufficiently) addressed. Research on *accessible technical communication,* therefore, constitutes an urgent desideratum.

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Voices from the field

Uschi Heerdegen-Wessel

Accessible services of the NDR and the ARD – current state, objectives and goals

The German regional broadcasting station *Norddeutscher Rundfunk* (NDR) has been successively expanding its range of accessible services for people with disabilities for many years.

The focus is on subtitling and audio description of television programmes, services in Sign Language and Easy Language as well as increasing the accessibility of online services. Additionally, the NDR has assumed responsibility for the project "Barrierefreier Rundfunk" (Accessible Broadcasting) within the ARD group. It will coordinate the further expansion of accessible services and is in a constant exchange with representatives from associations of people with disabilities.

Equal access to information through television is not possible if a viewer can only perceive the programme via one sense.

The ARD aims to make its wide range of services available to anyone interested in its programme. The ARD is the association of public broadcasting corporations in Germany. Das Erste is its primary television channel. According to ARD's policy, everyone should be able to participate in our information society and to access the ARD's television, radio and online services. All content should be freely accessible to as many people as possible, with the goal of not excluding anyone. Irrespective of any disability or impairment, everyone should have the opportunity to obtain information and form their own opinion in order to participate in public discourse.

Therefore, in 2011, the ARD's directors approved a catalogue of measures for the expansion of accessible services, which all regional broadcasters have since implemented consistently. Only the provision of accessible services can enable people with hearing or visual impairments to follow the programme on equal footing.

1 Subtitling of television programmes

Image 1

Television programmes are subtitled in three different ways: live, semi-live or preproduced. All auditory content – speech, sounds and music – is translated into written language according to the ARD's and NDR's standards for subtitling. Subtitles remove barriers. Primarily, they should enable access to audiovisual media for people who are hearing impaired or deaf and should convey the same level of knowledge as for people without hearing impairments. The basis for calculating the time frame of a subtitle is a value of 13 to 15 characters per second. This corresponds to the national average reading speed. The subtitles should remain synchronised with image and sound. Furthermore, it is important to remain as close to the original source text as possible and to transfer its full meaning.

While subtitles are primarily a tool for achieving accessibility, they can also help people with a migration background learn the German language through a combination of hearing and reading. They are also used whenever television programmes are shown in public spaces without sound.

The NDR has been broadcasting programmes with subtitles since the 1980s. However, the service was initially limited to the daily news "Tagesschau", films and crime series. This has substantially changed over the years. Since 2007, the NDR has had its own editorial department for subtitling. In the same year, the first show was live subtitled. Ever since, subtitles have been an integral part of not only the programme but also of the broadcasting mission. More formats are gradually being added, meaning 82% of the programmes are now subtitled.

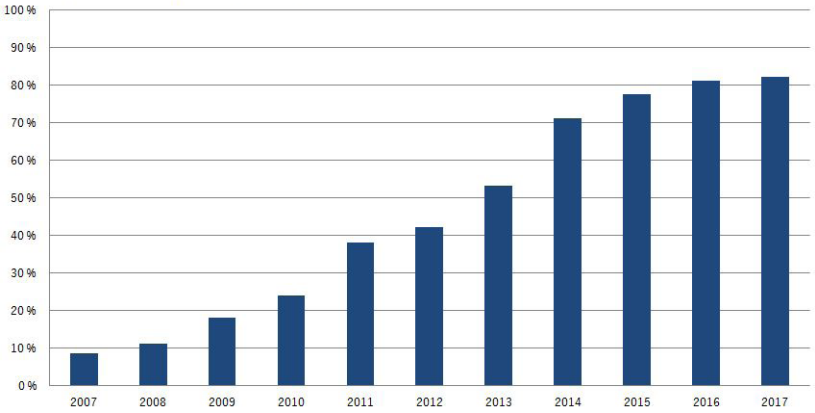

Figure 1: *NDR* quota of subtitles since 2007

Since 1 January 2013, all first broadcasts of *Das Erste* (ARD) have been available with subtitles, in accordance with the agreement concluded in 2011. The quota of subtitled programmes in the ARD has doubled since 2012 and is currently at 96%. At the same time, all nine German regional broadcasters have substantially increased their number of programmes that are available with subtitles.

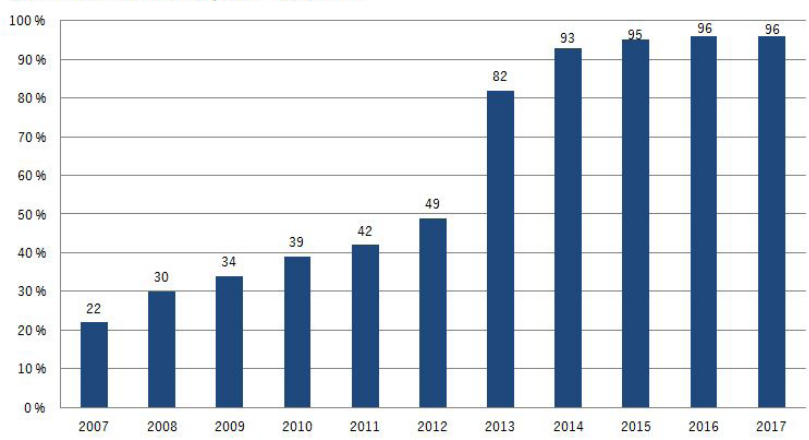

Figure 2: *Das Erste* quota of subtitles since 2017

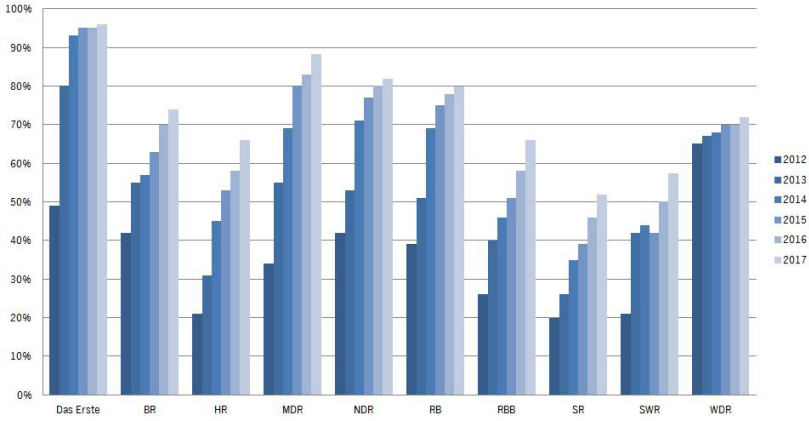

Figure 3: *ARD* quota of subtitles since 2012

Subtitles are displayed digitally or through teletext on page 150. Since June 2016, the ARD has also been offering a service for smart televisions in HbbTV (Hybrid Broadcast Broadband TV) format to people with hearing impairments, where the size, position and background of subtitles can be configured by the user. Users can choose between four font sizes and decide whether they want the subtitles to be displayed at the top or the bottom of the screen.

2 Audio description of television programmes

Image 2

For certain shows, the NDR also offers audio descriptions and allows people with visual impairments equal access to the TV programme. Users can activate an additional sound channel for audio described programmes with the remote control.

Due to the initiative of the NDR in 2015, the German, Swiss and Austrian regional broadcasters, as well as different companies and associations that offer audio descriptions have agreed on a set of principles for the creation of audio descriptions. Their goal is to provide visually impaired people with an accessible television viewing experience that equals that of the general public. The NDR produces audio described programmes according to these objectives.

The number of audio descriptions in the NDR has also increased continuously in the past years.

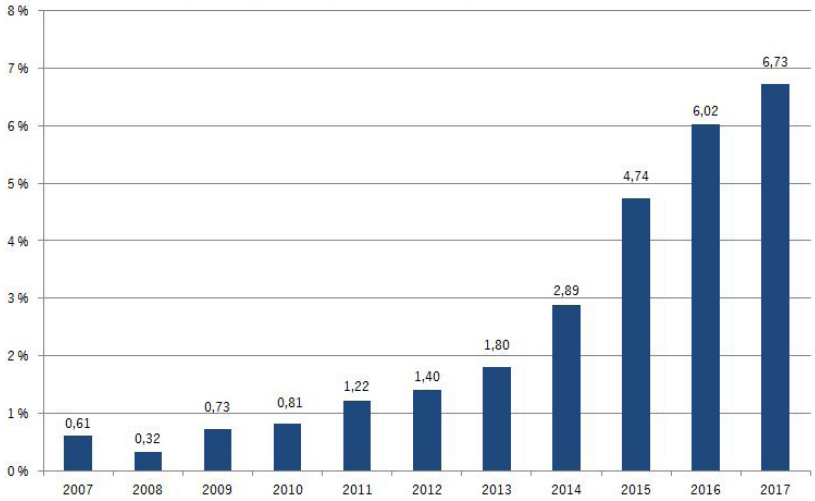

Figure 4: *NDR* quota of audio descriptions entire day

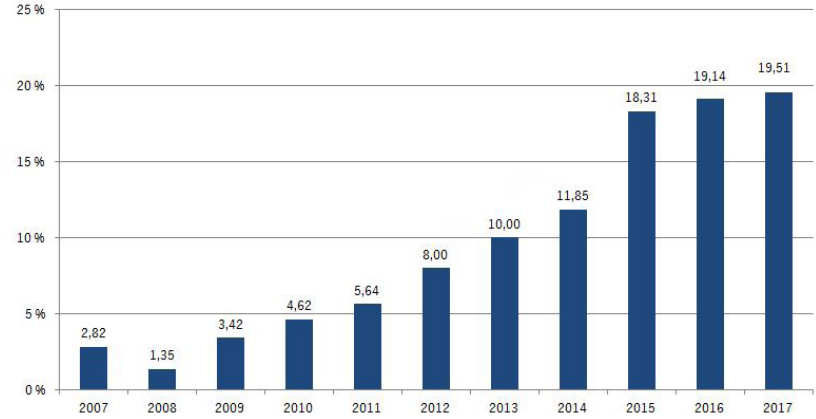

Figure 5: quota of audio descriptions prime time

As part of the ARD's catalogue of measures to expand the range of accessible services, a decision was also made to increase the number of audio-described films. Since the beginning of 2013, prime time programming has included all fictional formats (crime thrillers, movies, series), as well as animal and nature documen-

taries in an audio-described version. At the beginning of 2016, the audio description service of *Das Erste* was also extended to the early evening programming.

Currently, *Das Erste* offers audio descriptions for 18% of its programmes, in 2012 it was just 5%.

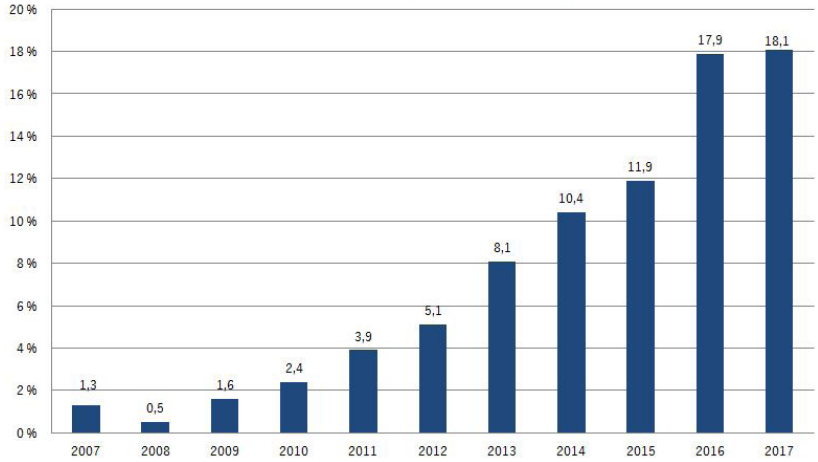

Figure 6: *Das Erste* quota of audio descriptions entire day 2017

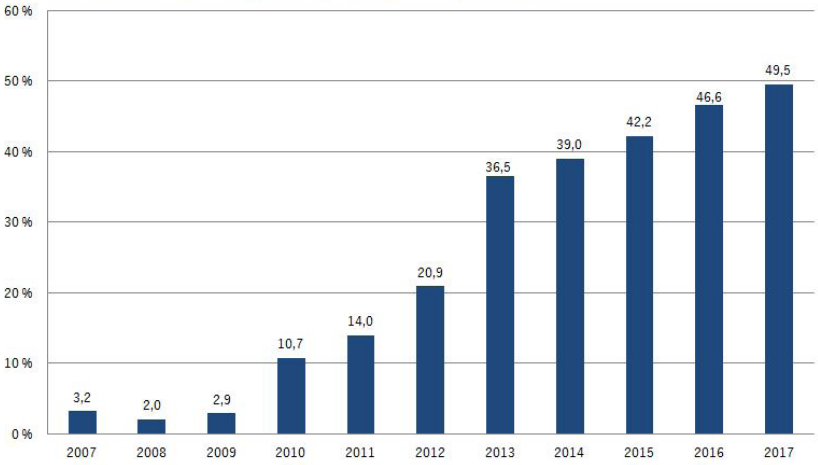

Figure 7: *Das Erste* quota of audio descriptions prime time

In addition to fictional formats and documentaries, the audio description service of *Das Erste* now also includes popular live entertainment formats.

For example, the NDR audio describes the "Eurovision Song Contest" and the *Mitteldeutscher Rundfunk* (MDR), the regional broadcaster for central Germany, as well as the *Süd-West Rundfunk* (SWR), the regional broadcaster for south-western Germany, provide live audio descriptions for other prominent shows. Audio descriptions of sporting events have also become part of the ARD's regular service: major sporting events like the European Football Championship 2016, the European Women's Football Championship 2017, the 2016 Olympic and Paralympic Summer Games, as well as the 2018 Olympic and Paralympic Winter Games were completely live audio described.

Moreover, the developments at *Das Erste* have had a positive impact on the regional television channels and the percentage of audio descriptions in their own programmes, since other broadcasters incorporate the films, reports and documentaries from *Das Erste*.

Additionally, a few regional broadcasters, for example the Bavarian broadcaster *Bayrisches Fernsehen*, have started to offer audio-described programmes of their own productions. The MDR also has more than doubled its productions of audio-described programmes since 2013 and managed to expand its audio description services to more genres with shows about central Germany's history, several documentaries and entertainment shows. Since 2013, the NDR has been creating audio descriptions for numerous shows of *Das Erste*, but also for their own programmes. The SWR also provides audio descriptions for regional series in dialect.

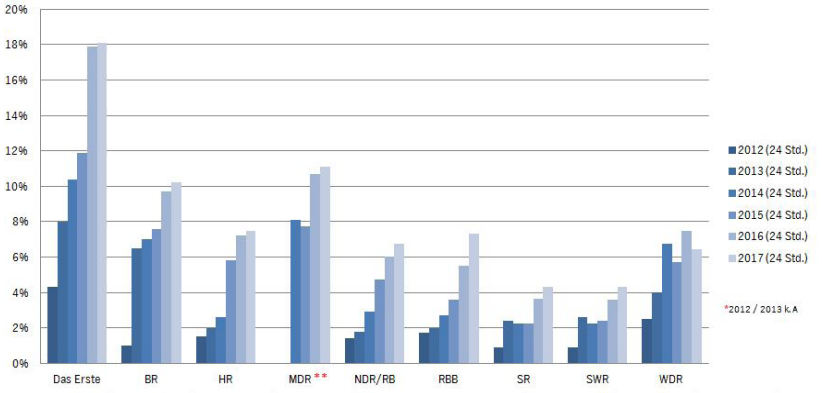

Figure 8: *ARD* quota of audio descriptions entire day

Within the ARD, there are several approaches to producing audio-described programme manuscripts. They can be devised by a sighted author alone or in cooperation with a blind author; nowadays, constellations of two sighted authors and one blind audio describer are rather rare. The number of authors involved in the process is not decisive for the quality of an audio-described programme's final outcome. Every audio description has to be independently evaluated in regard to whether the respective standards have been fulfilled. Many experienced individual authors create excellent descriptions that fulfil all guidelines in an exemplary manner.

In recent years, the following procedure has proven to be successful for the NDR: one author creates the manuscript and at the same time, a blind author receives the original film to properly evaluate the proposed manuscript of the audio-described programmes. Together with the NDR's audio-describing programme editor and the manuscript's author, the blind author discusses and edits the manuscript prior to studio recording. This process reduces production costs, maintains the dual control principle and integrates a professional blind editor.

A qualified blind or visually-impaired author should be involved throughout the production process in order to give valuable suggestions as the soundtrack contains a lot of information for blind people that is often not immediately apparent for sighted people.

3 Services in Sign Language

Image 3: Sign Language

In addition to the aim of broadcasting their main news programme in Sign Language, in 2013, the ARD also strove for the extension of their Sign Language section in the media library. Originally, they planned to publish one political magazine per week. Since 2014, they have been providing two magazines weekly.

These measures were decided upon in agreement with the associations of people with disabilities. This kind of communication plays a major role for the ARD. Therefore, many broadcasters and especially the NDR as the coordinator of the project "Barrierefreier Rundfunk" hold regular meetings with the associations in their respective broadcasting areas.

Subtitles have an extraordinarily large and diverse target group. In addition to helping millions of deaf or hearing-impaired people, those with a migration background or anyone studying the German language, subtitles are also useful wherever the TV is muted or in noisy environments, for example in public settings. Because of the large number of people who benefit from subtitles, the ARD prioritizes them over Sign Language in the expansion of its accessible services. The associations agreed with this decision in 2013 as well, since the ARD's available funds for accessible services are limited and

therefore have to be used carefully and with clear goals in mind. This also includes the cost-benefit ratio. The ARD also consistently takes the needs of minority groups into equal account. Therefore, all regional broadcasters strive to fulfil the needs of deaf people and offer an increasing number of formats in Sign Language.

As such, since December 2012, the "Tagesschau", which the channel Phoenix (German nationwide free-to-air channel) broadcasts with Sign Language interpreting, has been placed in the media library of *Das Erste* and the ARD. Also, political magazines are provided with Sign Language inserts and are available on demand in the media libraries. Since the beginning of 2018, anyone interested can watch the most successful political talk shows on German television via HbbTv and online, live, in Sign Language.

Some state broadcasting corporations offer further programmes in Sign Language such as the news, children's programmes, regional programmes and many more.

4 Services in Easy Language

Image 4: Easy Language

Since 2015, the regional broadcasting stations have been publishing texts in Easy Language. The NDR made the first step with a theme day on literacy and provided a first information package in Easy Language on their website that described the problem and presented assistance measures. Additionally, they published information about their broadcasting station in Easy Language.

The NDR online service "Moin Moin und herzlich willkommen" makes an important contribution to the inclusion of refugees coming to Northern Germany by providing information about the country in German, English and in Easy Language, as well as links, addresses and contact information on topics such as language courses or accommodation. Their service also includes news in English and Arabic in addition to children's programmes with subtitles in Dari, Arabic and Kurdish. Easy Language not only helps the 7.5 million functional illiterates in Germany, but all those learning German as well. This is another project to reduce barriers.

In addition to service offers, the NDR has been publishing their news in Easy Language since October 2015. Until the end of 2017, a weekly news format consisting of seven reports about topics such as politics, economics, culture, sports and more existed online. Since January 2018, the NDR has been offering the top news from Northern Germany in Easy Language on weekdays. You can have these texts read to you by clicking on the corresponding audio sign on the respective news page. Moreover, they provide a continuously growing online dictionary.

The MDR and two other regional broadcasters also offer information and news on their websites in Easy Language. "Deutschlandradio", a national German public radio broadcaster and the SR, a public radio and television broadcaster in the federal state of Saarland, publish weekly reviews in Plain Language.

5 Online services

The ARD has been offering its accessible online services for many years. The font can be enlarged as desired, the contrasts are sufficiently high, each link is marked with a target reference, visual content (images/graphics) is provided

with a descriptive alternative text, and texts are reproducible in Braille displays and can also be read by screen reader software. In the ARD media library, a steadily increasing number of programmes with subtitles, audio-described films or films in Sign Language is available at any time and place. In the *Das Erste* media library, almost all programmes are available with subtitles.

6 Radio broadcasting

Accessibility is also a major concern for the ARD radio stations. Radio is one of the most important sources of information about political and cultural life, especially for blind and visually-impaired people. Time-independent access to broadcasted audio content is an important part of communication with the environment for visually-impaired people. The MDR, for example, pools all livestreams of the MDR radio programmes and the radio channels that are only available online in "MDR Audio – Das inklusive Hörangebot" (MDR Audio – The inclusive radio service). In addition, the MDR app "On Demand" makes audio, podcasts and audio tracks of programmes with audio description equally accessible to everybody. Current news, weather and traffic information – regionalised on request – complete the service.

7 Outlook

The expansion of accessible ARD services has been going on for many years and is still ongoing, though some shortcomings do exist.

Despite all efforts, it has not been possible to make all services in the field of mobile devices completely accessible. This is also related to external factors, for example, whether or not the corresponding mobile device can display subtitles. In this field, there is a lot of research dedicated to finding solutions. For instance, the "rbb-Innovationsprojekte" (rbb innovation projects) of Berlin-Brandenburg Broadcasting (rbb) focuses on the question of how television accessibility can be even further improved with digital technologies.

The ARD orientates itself towards the target groups' interests and needs in order to develop further measures, and continuously discusses how to set its priorities together with associations for people with disabilities.

Expanding accessibility is a continuous process in which NDR and ARD have already taken major steps forward in many areas. This is also regularly confirmed in the discussions we have with the associations. We want to continue along this path and are working consistently on reducing still existing barriers in order to enable participation for as many people as possible.

Laura Marie Maaß

Accessibility at cultural and live events

1 A plea for cooperation

Cultural and live events present special challenges in terms of accessibility. Not only does "live" carry the usual risk that participants, as well as non-participants, do something completely different than what was agreed on, there are usually also artists among the participants. And artists often have special requirements regarding stages: The lighting should cover a specific colour spectrum, a certain number of lights should be hung, catering should be scheduled for a certain time or the stage flooring must have a certain grip in order for artists to be able to perform various dance steps or to give the drummer sufficient support. One could dismiss this as unpleasant or diva-like behaviour, and some artists may also have rather unusual wishes, but all these little things actually contribute to them feeling more comfortable doing their job while remaining healthy and giving the audience a good show. In this business, these arrangements are completely self-evident. Of course there is a call sheet that contains the exact time schedule for artists' arrivals, food and the time when the location has to be cleared again. However, while everyone understands why an employee in an office needs an ergonomic chair, the artists' wishes often seem incomprehensible for the general public. It may seem complicated from the outside but it greatly improves cooperation between the different trades and is a matter of course in this industry.

Generally, laypersons exhibit the same amount of incomprehension regarding the procedures at major events as the general public has in terms of accessibility at cultural events. The workers on site are experts in their field. For years, they have been providing optimal lighting, they know the cables lengths and which speaker starts rumbling at what time. When it comes to accessible events however, I am often faced with different reactions. I would like to illustrate

some examples and explain how accessibility at cultural and live events can be achieved. However, speaking from experience, this works especially well if all experts value each other's contributions to the event.

2 "They don't say anything important anyway" – Lighting

A lighting engineer (and the person who uttered this sentence) I once worked with knew the play he was involved in by heart. He knew every sentence, every scene and had an actor been unavailable, he probably could have jumped in immediately. He was a particularly gifted lighting engineer. The lighting was on point and one could not have imagined anything better. However, during all the years, he had never worked with Sign Language interpreters. According to him, it had been exciting that there were once some people who worked with hearing aids, but it did not really impact him further. So, he knew people with hearing impairments – great! If you have any kind of experience, then use it! Even if it is with your grandma, your neighbour with a walking aid or the blind woman in front of you at the checkout counter. Nothing is more valuable than actual contact and your own experience when dealing with people (with disabilities). While people have a relatively high degree of understanding for a ramp at an entrance, the additional light for Sign Language interpreters is still a disputed subject. "They don't say anything important anyway." How often do you say that to your grandma and when does she start to tune out, become indignant, continue talking, or change the topic? So, you already know that disregarding hearing-impaired people's needs can cause difficulties and other solutions might work better. Those without hearing impairments decide what is important or not while listening. Therefore, we should also leave this decision and responsibility to deaf and hearing-impaired people by making everything accessible to them from the start.

For accessible cultural events, this means that basically everything is important and as soon as information is transmitted acoustically, Sign Language interpreters need to be illuminated. If the stage is completely dark, the light may also be blue or dimmed. Just consult your experts on site! Be brave and extend

this concept to people who are visually impaired, or wheelchair users at a party with tall bar tables: "There is nothing important to see anyway."

3 "We are really not talking about anything complicated" – Preparatory material

Usually, interpreters and translators will ask for preparatory material in advance. We need this in order to provide you with the service you have booked and paid us for and that your customers deserve. "I thought you studied this?", is one of my favourite questions on this subject. The demand for preparatory materials might seem strange. After all, interpreters can hear what is being said and they can interpret simultaneously – can't they? And they simply have to repeat what has already been said, just in another language. Plus, they have studied all of this – haven't they? Let me give you a typical example from my work to explain how even small things can become a problem.

I am in a preparatory meeting for a concert and interpreting for a deaf advisor. The names of the staff and trades are mentioned. Mister Müller, who is not present, is the topic of the conversation and often brought up in connection to remaining tasks. "That's Müller's job", is a phrase I interpret quite often that day. And because I don't want to always repeat "Mister Müller" every time he is brought up, I place "him" within the signing space in front of me by signing MISTER MÜLLER once and pointing to a specific spot in front of me. If I point towards this spot later on, my counterpart will know who we are talking about, just like in spoken language by saying "he" and referring back to the previous sentence. Later on, we talk about the stage manager, who seems to be responsible for many tasks as well. Since he is also frequently spoken of, he too gets a spot within the signing space, a different one from Mister Müller's of course. After every task is distributed, the deaf advisor notices Mister Müller and the stage manager each have relatively few tasks. As it turns out later, both men are one and the same person and became two due to my lack of preparatory material. Although unfortunate, you can easily avoid such situations by providing information beforehand, if we ask you for it. We will tell you exactly what we need. If you organise a cultural event, that would probably include

artists' set lists, song lyrics and their accompanying music. Furthermore, if available, scripts of speeches, names and roles of involved people (e.g. the stage manager Mister Müller), technical terms, proper names and if necessary customary terms.

4 "How many people are going to show up?" – Advertising and expectations

I often come across an expectation that the audience is going to consist of hundreds of disabled people if you put a ramp at the entrance. That either means major concerns ("Are non-disabled people still going to show up?"), high expectations ("If we are going to do this for them, it has to be worth it."), and more often than not, uncertainty ("Will I need more security staff?"). I have been a Sign Language interpreter at concerts on German stages for several years. When I started in 2011, it was a very unusual job in Germany and a great deal of pioneering work had to be done. In preparation for my first concert, the organiser announced "That's a good idea, but not at this concert". Fortunately, the band fully supported the idea and really wanted to make it happen. We managed to talk the organiser into it and got a "Do it then, but don't tell anyone in advance" in return. So, I made a video in Sign Language, without sound, subtitles or a translation, and invited the deaf community. The concert itself had a great atmosphere, the evening was magical for the audience, the band, and the organiser. Thanks to the experience of this very first concert, a wonderful change took place. The following year was incredibly uncomplicated.

Let's take a look at the bigger picture and ask ourselves how people with disabilities will know that your event is accessible, or at least has fewer barriers. Exactly, thanks to your advertising. Unfortunately, accessibility for all is still not always the case nor that everyone is welcome everywhere. This does not only apply to people with disabilities. If your event takes certain peoples' needs into consideration, then that is great and should definitely be announced. Hosting a "wheelchair accessible event in the middle of nowhere" is not necessary but using established symbols (wheelchair user, a crossed-out ear, signing hands) on your posters or website is enough. Specify your

accessible services in a separate menu item on your website. Are there Sign Language interpreters? Where is the entrance for wheelchair users? How many accessible toilets are there? Do you offer discounts for accompanying persons? Are there induction loops for people with hearing aids? Are you hosting events throughout the country? Awesome! Tell your guests about accessible hotels and restaurants in the surrounding areas. Apart from clear indications and the symbols, you should also use other distribution channels. Since you are enlarging your target group, feel free to use more channels for distributing information as well. Google your local associations for people with disabilities and inform them about your services. They will either have their own distribution list or provide you with good contacts in your region. Use those channels as additional resources, not as a replacement for your usual advertising campaign. You can also reach many people with disabilities through traditional channels. People with disabilities use social networks as well or see your advertisement in the city.

If you offer good services and have appropriate advertisements, everything will basically run as usual – people will or won't show up. There is no recipe for a guaranteed fully-booked event in this field either. But with accessible services, you make the first and most important condition available: access!

5 "We never have any wheelchair users here, we don't need a ramp" – Supply and demand

There are no deaf people coming either, so you don't need Sign Language interpreters? See what I mean? Of course, people who have special needs will contact you in advance and ask about this or that. Are there steps at the entrance? Is there a lactose-free lunch option? Can I leave my suitcase with you? Can I take my five-year-old child with me? Many of these things are taken (more) for granted nowadays. Just think about the feature on Facebook to create an event: with just one click, you can indicate whether the event is child-friendly or not. Use your channels and communicate your accessible service. If you are unsure about what you actually have, use online checklists, for example. Communicate as much as you can and, in addition, also signal openness: "We have no steps.

If you have any further questions about access to our facilities, please do not hesitate to contact us." Fantastic. And so simple. Is this not enough information for you, do you want the specifics? That's also fine! Include experts in your team and think about accessibility from the very beginning. You know of a stage constructor who can leave the ramp that he himself uses for construction and that has a good gradient? Why don't you book him right away? There is a venue with sufficient door width and in general similar conditions to the event rooms on your shortlist? Then there is no question what you should book. Create access, communicate openness, use the advice and experience of your colleagues – as it is common in other professional areas and typical for a diverse society.

6 A word to the people on stage

Dear musicians, artists and other people on stage, have you been booked for an accessible event? Congratulations! Thank you for getting involved. In the quiet moments in the backstage area, many of your colleagues told me about their thoughts before a concert with Sign Language interpreters on stage or with disabled people in the audience. At this point, I would like to thank everyone who shared their experiences with me.

Many people reported that their biggest problem was that they neither knew many people who had actually seen a Sign Language interpreter at a concert nor that they had ever worked with them. Does the audience somehow react differently? Do the interpreter and I share every one's attention on stage? Are we going to be distracted? Or will the hearing people behave "as always" and the other part of the audience, presumably the deaf people, very differently? Can the interpreters really translate everything? And will they actually do that? And I also have a few questions, which some may find *not quite politically correct,* but I would still like to have some answers to these questions. Who can I ask something like that? The resulting uncertainty was often intensified when accessibility was explicitly announced beforehand, thus creating additional expectations. In the introduction of this article, I explained that accessible events are often successful when all people involved respect each other as experts in their area. If you have any questions, ask us. That's what we

are here for. Do not be afraid of the supposedly "taboo" topics. We are used to the fact that people, who have reflected on these questions much less than you have, constantly ask us all kinds of questions. And answering these questions is part of our job. We are happy to do so.

7 Your questions: an attempt at some answers

Does the audience somehow react differently?

When there is a Sign Language interpreter on stage? Yes, probably. Simply due to the fact that there is one more person on stage. At the beginning there is often some curious irritation and after the first, the second or the third song it makes sense to briefly explain to the audience what the Sign Language interpreters are actually doing over there. And you're welcome to do that in as relaxed a manner as always: "That's Max on the drums! Tina on the bass! And Laura on Sign Language." Done. People with disabilities are as diverse as everyone else. Of course, somebody might dance differently than is common. Or somebody shouts louder than the others. Everything's possible, but everything can also be very normal. Allow yourselves to respond to shouts, dancing people and anything else that can happen, as usual. You make music and your audience would like to dance to it. Your music is obviously well received. So it's okay to simply be happy about that.

Are people without any hearing impairments going to behave "as always" and the other part of the audience, presumably the deaf people, very differently?

Yes and no: All people in the audience who can see will respond to the additional visual offer in some way. It is our job to do a good show together – then we will create a joint audience and even before we have finished our first drink, we will hardly be able to distinguish who actually entered the concert hall as a person with or without hearing impairments. It has often happened to me, for example, that after a few songs, the hearing people were also waving their hands around in the air. That is the gesture for "applause" in Sign Language. Deaf people applaud like that, because the visual shaking of their hands above

people's heads is more impressive than the acoustic clapping together of hands. Many hearing people find it exciting to simply imitate this gesture and thus it often happens that the applause is relatively silent – but visually all the more convincing. You can look forward to that!

Do the interpreter and I share everyone's attention on stage?
Consider us as guest musicians. We play an additional instrument and contribute something to your amazing stage show. You are the leading light. Involve us, if you like. We could change positions, play air guitar together or encourage the audience to clap their hands – we are happy to do all that! And conversely, we also like to involve you. You could sign some words of your favourite chorus with us, we will show you how to do that as soon as we cross that bridge. In the end, that always looks great. This already answers the question whether the people without hearing impairments will behave "as always" and only the deaf audience will behave completely differently: in the best case, we can no longer tell who belongs to which group after a very short time.

Are we going to be distracted?
Yes, perhaps. We will be happy to do a soundcheck with you. Watch us, just check a moment longer if you want to get used to it, and let's film a part of it, so that you don't feel like you're missing out during the show and end up constantly looking at us and being distracted.

Can the interpreters really translate everything? And are they actually going to do that?
Yes, we can, otherwise we would let you know beforehand and we can find a solution together. And whether we translate everything? I would say yes :-)

And I actually have a few questions, which some may find *not quite politically correct*. But I would still like to have some answers to these questions. Who can I ask something like that?
You can ask us. Nobody knows all terminology, all the details about the actual state of the difficulties in the everyday life of a disabled person. Use our expertise. You have agreed to attend the event – you have every right to receive infor-

mation, to have your questions answered and your uncertainties eliminated. We might make mistakes too and confuse the guitar with the bass from time to time or perhaps ask the sound engineer to make us a nice mix instead of doing the full soundcheck ourselves.

8 Finally, I would like to approach you with a request

Finally, I'd like to make a request: Please be open with your feedback. You are part of a new development in Germany and it would be a shame if your experiences could not be included in its further development simply because you keep it to yourselves. Talk with us, with your colleagues and with everyone who asks you about it. Together we can create something wonderful and new for all of us. Thank you!

Dana Apel and Jörg Apel

"Society should accept us as we are"

(recorded by Loraine Keller)

Dana and Jörg Apel are married and have two children. Like their children, they are deaf. Both teach Sign Language: Jörg Apel is a freelance lecturer for German Sign Language (German abbreviation: DGS), e.g., at the University of Hildesheim, at the Hartwig-Claußen-Schule in Hannover, a school with a special educational focus on hearing and communication, and in various companies. Dana Apel is a pedagogical assistant at the education centre for the hearing impaired in Hildesheim (in German: Landesbildungszentrum für Hörgeschädigte). She supports deaf students in reading texts and explains the class contents in Sign Language. She also teaches German Sign Language to teachers and educators.

Dana Apel: At the age of six, I fled from Czechoslovakia to West Berlin with my family. My parents are deaf too. That's why I learned Czech Sign Language first. Then in Berlin, I was introduced to German Sign Language: at school and by communicating with my childhood friends, I quickly learned German Sign Language. At home, we communicated with a mixture of German and Czech signs.

Back then, spoken language was the main focus in class and it was taught by using the "oral method". The use of Sign Language was not allowed at school. We had to keep our hands under the table in order to prevent us from chatting. We children at school were trained to speak and to pay attention to lip movement. For example, at school we had to sit down in front of a mirror with the teacher and articulate all the different sounds with our mouth. We had to learn how to pronounce sentences for hours. That's why actual class contents were often not sufficiently covered. Lip-reading is really exhausting and it takes a

lot of time until you reach a certain competence. In addition, you can lipread roughly a third of all sounds and you need the specific context in order to interpret the viseme. It was a different time back then and the moments at home, when only Sign Language was used, were cherished. It was not until German Sign Language was legally recognised as an independent language in 2002 that things finally changed for the better for deaf people, including me.

Jörg Apel: The situation at my home was special as well because my parents have no hearing impairment. But they adjusted to me being deaf pretty well and together we even invented our own signs to communicate effectively. We used these signs at home until I became more and more confident with German Sign Language, especially by communicating with other deaf people. I was born in Lemshausen near Göttingen in Germany, where my relatives live. But there was no school for deaf people, so my parents opted for the nearest of the four schools for deaf people in Lower Saxony. My family moved to Hildesheim so I could go to school there because my parents didn't want me to attend a boarding school. Sometimes, the teachers secretly used signs in order to explain certain subjects better, which was very helpful for me. German written language was taught in German lessons at school, but it was actually hard for deaf people, because grammar in German written language is completely different to the grammar used in Sign Language.

"Deaf people had to put up with quite a lot in the past."

When you ask both about their experiences with barriers in daily life, they report positive results over time: it used to be challenging when you, as a deaf person, needed to go to authorities for example. If you wanted to apply for documents and were asked to fill in forms, you needed to take a lot of patience and time with you to make yourself understood. The Apels needed to try to speak in order to achieve their goals in those situations. They were very patient in communicating their needs to people without hearing impairments. Unfortunately, many misunderstandings still occurred in these situations because they were not understood. That is why they had to put up with a lot, even when people

without hearing impairments were accepting and tried to meet the needs of the Apels by speaking slowly.

There used to be no interpreters then. At that time, teachers from school and family members accompanied deaf people as interpreters at medical appointments or matters with authorities. They helped a great deal with the communication and when dealing with important issues, but there were still misunderstandings and situations in which they were treated like children. Fortunately, the situation has changed now according to the experiences of the Apels. There are many more professional interpreters and there is greater awareness for the needs of deaf people.

The couple says it was typical to exclude deaf people from communication at the workplace. Other people communicated in spoken language, when at the same time, deaf people were not able to participate in conversations and felt excluded during break times. That is why having a supportive community among themselves is so important for deaf people. Interactions with each other are essential. This means that they often want to remain among themselves even today.

Communication as a barrier

Dana and Jörg Apel: Communication is the key and the problem at the same time. Everyone else, whether wheelchair users, autistic or blind people, cannot only communicate with each other, but also with members of other groups. Deaf people are not able to do that, which separates us from society: communication becomes a barrier. In today's fast paced world, being deaf we often do not have access to all the information we need. Nowadays, many things change rapidly, so that deaf people are afraid of losing touch with society. Many texts are too complicated and too difficult to understand. That is why Easy Language is a real relief. Although many authorities are still not equipped with forms or texts in Easy Language, the tax office provided a shorter text in Plain Language once. However, deaf people need more information in general. These days, many changes are happening and we are afraid that the deaf community will be somewhat left behind.

Barriers in everyday life

Jörg and Dana Apel can list several barriers in everyday life. For instance, it is often problematic to make eye contact with people who are not deaf if they do not initially realise that they are interacting with a deaf person who they cannot simply talk to.

Dana Apel: I have experienced this many times at the counter of a transport company. If the employee does not look at me when I want to buy a ticket, it can take a lot of time and patience until I can draw their attention and express my request. Such employees believe I can hear them and do not turn to face me. It might get even worse in the future, because everyone only looks at their smartphones.

Another barrier for deaf people is that they often need an interpreter to communicate, which is why they can rarely do something without pre-planning. Usually, it takes several weeks to secure the service of an interpreter to assist at the job centre or for a doctor's visit, even though it might be urgent. Another barrier related to these problems is the telephone: There is a telephone service that works with a webcam and the help of an interpreter, but that costs additional money, in addition to the standard fee you also pay for every minute, and you are dependent on help from others again. Deaf people can make calls independently only via webcam and with a communication partner who understands Sign Language and is able to react or respond in some way.

Dana Apel: The problem of making phone calls even applies to the Internet. I have often experienced that a telephone number is required as mandatory information when making an order on the Internet. But we do not have a telephone number and it is very annoying when this prevents us from ordering online. In those cases, I have already contacted companies and asked them to remove the compulsory information. Some agree, some do not even react at all. A fax number would be much easier, but since this medium is now obsolete, the option hardly exists anymore. We face the same problem when it comes to

game competitions and lotteries. I have found the answer to the riddle, but I have to make a call! Am I not allowed to win because I am deaf?

Jörg Apel: A further barrier can be found in cultural services, which are not always accessible: For the most part, films in cinemas do not have subtitles. In that case, we have to wait until the DVD with subtitles is released. However, most German films or series on DVD do not come with subtitles either. Although there are services that offer the option to watch subtitled films in cinemas, not all films are included. The application "Greta & Starks", for example gives access to audio-descriptions and subtitles of films, but the offer is limited. Theatres still try to work with surtitles, but the offer is still limited. Spontaneous visits are not possible as one has to check in advance if surtitles or a Sign Language interpreter are available. In the future, Hildesheim will try to offer more accessible services.

Dana Apel: At events like city festivals, an interpreter for German Sign Language should be a given. Being a deaf person, I do not always want to be forced to wait until an interpreter is available. It would be lovely to spontaneously go there without having to organise things. I am convinced that more hearing-impaired people would go to cultural events and also open up to hearing people if more interpreters were provided.

"Society should accept us as we are"

Family Apel wants both cultures, the culture of the hearing as well as the culture of the deaf people, to open up.

Jörg Apel: I would also like deaf people to change: they are almost exclusively within their own small group. They still cling to their community too often. In terms of inclusion, I would like them to open up even more. Sometimes I would like to bump them and say: "Open up more, trust yourselves, go visit more events!" But since society is dominated by hearing people, they should

continue to try harder to break down barriers when it comes to communicating with deaf people.

Dana Apel: I would like to do more sport activities without feeling excluded. It should be natural for me to go there. Hearing people should not feel inhibited with me being there. It is supposed to feel like I am not any different. I desire more sensitivity in society – the hearing people do not have to be afraid to approach deaf people. Communication is also possible through written language, as well as with intuitive or speech-accompanying gestures. It is not even necessary to know Sign Language in order to communicate. Hearing people can easily gesture, they should not use too complicated words and speak as slowly as possible, so that deaf people also understand what they want to say. I want society to open up and accept us as we are. As a result, we will accept the hearing people as they are too. It is important to me that hearing people do not want to change me and do not keep asking me: Why do you not have a hearing aid or a cochlear implant (CI)? Why do your children not have one?

Due to the fact that their children are deaf, the Apels are often met with shock and pity. But deafness is not a problem for the family.

Dana Apel: Everything is fine as it is. We have no problem communicating within the family as we talk in Sign Language. Even when the children were babies, we gestured and told them stories in Sign Language, just as hearing people do. Of course, we always get the reaction: "How does it work? The children can't understand that yet!" We wanted to give our children all the information as well so we talked in Sign Language to them. If our child had not been deaf, we would have also accepted it and made the best of it, finding a way to communicate. Both of our deaf sons visit a public secondary school and are constantly accompanied by interpreters. The interpreters also attend class trips or theatre visits. General knowledge and education are very important, also for deaf people.

Existing discrimination on the way to an inclusive society

Nowadays, discrimination is still very prevalent, especially in the medical environment. While schools and other institutions are changing and making inclusion possible, acceptance and tolerance for deaf people are still missing in the medical field.

Dana Apel: It is incomprehensible to us that this kind of discrimination still happens today. Deaf people have had to accept a lot of criticism in the past and there was almost no awareness that we have the same right to participate in social life. But I find it particularly shocking that discrimination still occurs in today's inclusive society, for example, if I visit a new doctor who notes "deaf and dumb" on the patient information sheet. That is discrimination because deaf people are not dumb! Such antiquated and discriminating views offend me.

Dana and Jörg Apel: There are doctors who put a lot of pressure on the parents of deaf children. Many doctors want to use a cochlear implant on deaf children, even if it is against the will of the parents. This deficit-oriented and problem-focused attitude is discriminating towards deaf people and we find it profoundly presumptuous of doctors to deny the parents this decision. The insertion of a cochlear implant is always associated with risks and therefore, it is up to the parents to decide whether they want their children to take the risk or not. In addition, there is no guarantee that the child will be able to completely hear after that, and after the implantation, a long period of "Listening Practice" will begin. Therefore, we have deliberately decided against a CI for our children. We wanted our kids to have time to play and have a lot of freedom. They are very happy and satisfied with their lives as deaf people and would not want it any other way.

Thomas Widmayer

"There's still a lot to do, but we're heading in a good direction!"

(recorded by Loraine Keller)

I have been working at the *Lebenshilfe Braunschweig* since 2008. I was classified as employable in the secondary labour market and work as an office assistant in the Braunschweig office for Easy Language. My tasks include reading books and news aloud in Easy Language for other clients of the *Lebenshilfe Braunschweig*. In 2007, I was diagnosed with a mild form of Asperger syndrome. I sometimes notice impairments in my life. For example, I occasionally have problems with complicated letters from public authorities or doctors. But all in all, I still manage to be independent. I only need support for a few things.

Before I received an external workplace in the Office for Easy Language, I used to work as the head of the review group for Easy Language. I know the texts very well and from my experience, I know exactly what the characteristics of a high-quality text in Easy Language are. Through the constant contact with the texts and the review group, I became very practiced in handling the texts – almost "too good" to review the texts. My experience is so valuable that I can now translate short texts into Easy Language. Whenever a sentence in a source text is too long and nested, I split it up and translate it bit by bit. If a sentence contains difficult words, I have to check whether the target group already knows them or not. From my former work as a review group leader, I can certainly estimate which words require explanation. I am aware of how difficult it is for translators to anticipate the background knowledge of the heterogeneous target group solely in terms of word level and without using a childlike mode of phrasing at the same time. I am experienced with impaired people and I can therefore assess the existing level of education of the target group very well. Of course, even as an experienced translator, I also have to

work with auxiliary means. For example, I like to use the Duden (the most commonly used German dictionary) as it provides reliable help with unknown or complicated words. Furthermore, I use online search engines to research facts as well as certain terms or concepts.

But in my opinion, the range of services in Easy Language is still too small. The administrative texts of authorities alone, which I also have to deal with constantly, represent a barrier in everyday life. Often, I am not sure whether I have understood the letters addressed to me correctly. Some authorities are interested in improving their forms and letters, to make them more comprehensible. I would appreciate more services in Easy Language in the area of administration and authorities. Aids for the completion of forms would help me and many other people directly and pave the way for the independent completion of necessary forms.

I hope that in the future there will be more texts in Easy Language within the leisure segment. Some of the senior citizens I care for are very happy about the sports news in Easy Language. Many of them are fans of the local football club Eintracht Braunschweig and are generally interested in football and other sports. I independently translate articles dealing with the latest games and reports of the club into Easy Language, create more comprehensible reports and read the easier version aloud in the day care facility for senior citizens. The great enthusiasm of the people shows me that more articles should be translated this way. Therefore, I call for more services in Easy Language in true-to-life sectors like sports and leisure.

I would also like to see more newspaper articles in Easy Language. I think even people without impairments sometimes do not understand all of the content in the daily newspapers. In spite of my impairments, I graduated from the same "normal" school like people without impairments. After primary school, I went to an integrated comprehensive school (IGS) and I graduated from secondary school. Personally, I am very interested in science and philosophy. I often do not have problems with the contents, but with language comprehension, which means that I have big issues reading texts on these topics. But nevertheless, I have no problems living independently. I enjoy my job and the contact with my colleagues. I continue to grow with my tasks and challenges a little more every single day.

Cornelia Plagge

"The range of accessible services is still not sufficient"

(recorded by Sergio Andres Hernández Garrido)

As a member of the target group for Easy Language, Cornelia Plagge spent nine years testing the comprehensibility of source texts before they were translated. At first, she voluntarily completed a training measure to become qualified as a reviewer. After that, she was integrated into a group that reviews texts at the office for Easy Language at the Lebenshilfe Braunschweig (an organisation to help people with impairments). She worked there for two years. Today, she has dedicated herself to the interests of people with learning impairments.

Nowadays, Plagge rarely works for this group because her understanding of standard language texts has improved significantly after years of experience. "It was always a pleasure to review texts, but I have become too good at it", said Plagge, laughing. In every session with the review group, the reviewers learn something new, both thematically and linguistically. Although Cornelia Plagge still needs accessible services, she is already overqualified to take part in a review group. Instead, she now belongs to the group of experts that advocates for Easy Language beyond Braunschweig. This expert group represents the office for Easy Language by participating in interviews and events. They are experts at reviewing texts in Easy Language and, at the same time, represent the primary target group.

As part of the review group, Cornelia Plagge worked on texts to be translated into Easy Language. Source texts were read sentence by sentence or paragraph by paragraph by the group. It was then discussed at which points difficulties in understanding emerged. Those difficulties could be of many different natures: For example, one word could be too hard for the reviewers, or one sentence could be too long and intricate. The font could possibly not

be legible due to the font type, or the contrast with the background, etc. The task of the test group was to make suggestions for improvements that would be considered afterwards in the translation into Easy Language. According to Cornelia Plagge, the reviewers worked on the improvements until the whole group understood the information in the text.

As a reviewer, Cornelia Plagge has worked with many different types of texts, such as brochures from museums, texts about politics and religion, and she has even reviewed city guides for translations into Easy Language. Her work, however, was not limited to sitting in a room and reading texts on various topics. For example, the review group cooperated with the Till-Eulenspiegel Museum in Schöppenstedt on the development of signs in Easy Language. In addition, they also reviewed the translation of individual texts and then visited the museum to take a look at the permanent exhibition "Ein Erlebnis für alle" (An experience for everyone).

Plagge believes that there are still not enough services in Easy Language in everyday life. According to her: "More texts need to be translated into Easy Language". At the moment, Plagge still frequently encounters texts that are not comprehensible to her in everyday life. "For example, package inserts for medicine are quite difficult for me," she says. "It would help a lot if they were translated into Easy Language."

According to Plagge, there are problems not only with the insufficient supply of texts in Easy Language but also an overall lack of consideration for people with impairments in society. Although there are more accessible services through legislation, there is still a lot that needs to be done. "I wish more cultural events would be planned for us in the future, for example, in cinemas or theatres," says Plagge. She believes Germany should do more for people with impairments.

Janna Hinrichs

Working towards self-representation of people with impairments in society

(recorded by Loraine Keller)

I studied linguistics and have been working for the Lebenshilfe Braunschweig for two years. I run the Centre for Easy Language, which was built with the financial support of Aktion Mensch (private German charity and lottery). Although the Lebenshilfe has been working with Easy Language for ten years and has also had a review group for the same amount of time, a specially aligned office for Easy Language was only created recently. The Centre for Easy Language creates texts for the Lebenshilfe Braunschweig and translations for external clients.

The Centre for Easy Language offers not only translations but also conducts training measures with the aim of promoting Easy Language in and beyond Braunschweig. In the translation process, different sets of rules are considered depending on the customer's wishes and translation briefs. In terms of language, my colleagues and I follow the set of rules determined by the client. As far as the content is concerned, the focus is on the opinion of the review group. They determine what is relevant or irrelevant, which facts, words, or concepts need to be explained, and what passages can be included in the Easy Language text and which can be omitted. On request, individual reviews of the texts can also be carried out. The text then goes back to the customer, and a new review process takes place. This could include, for example, adapting the text to the *corporate language* of the client's company. The result is a text in Easy Language that is published by the client.

In the past two years, I realised that there are major differences in the levels of Easy Language texts. Different target groups with different language levels are addressed because it is sometimes not clear who the target group is. In

some cases, there are texts that are aimed at people who can only barely read and write. In my opinion, these are more closely related to augmentative and alternative communication. Sometimes there are texts that deal with more complex topics and use a more complex language but are still considered Easy Language. This is a difficult situation, because there is no universal standard for Easy Language. This dilemma is also quite hard to solve as the needs of people who use Easy Language have to be met. From my experience, it would be a good start to mark a text and define which group of people it would be best suited for. This would also help to counteract the stigmatisation attached to Easy Language and its target audience.

I often encountered clients who already had a certain image of what a text in Easy Language should look like, because they had seen one before. Clients then often requested that we translate the new text in the same way, which is not always useful or possible. The difficult part is to find a compromise and produce a text, that, on the one hand, meets the expectations of the client, and, on the other, fulfils our own quality standards.

With regards to research, it seems to me that studies on Easy Language texts often do not include the situation in which they originated. It is problematic to test whether published texts are high-quality and "good" Easy Language, because the conditions in which these texts were produced vary widely. The finished text no longer reflects the specific requests of the client or other factors influencing its production, which is why it is sometimes not clearly identifiable which translation strategies were chosen and which were not. In my opinion, an assessment of a text that has already been produced is not expedient.

The Centre for Easy Language of the Lebenshilfe Braunschweig is part of the Empowerment Movement. Therefore, contracts for services of the Lebenshilfe are in Easy Language in order to enable impaired clients access to desired services. Furthermore, clients of the Lebenshilfe are informed about their rights and obligations in Easy Language, so that they are easily understood and the clients can then act accordingly. For me, the focus of Easy Language is as follows: it should enable people with impairments to participate in a self-determined way for a more independent life. They should be able to continue to stand up for their rights and to point out the barriers that still exist today so that we can try to reduce them together. Easy Language is not a cure-all solu-

tion, but it is an important tool to continue the equal rights movement. In this spirit, the Lebenshilfe Braunschweig offers in-house and external care to locals. It is designed to be an inclusive environment where people can live and work. The houses of the Lebenshilfe are distributed all over Braunschweig allowing people who use their services to participate in urban life. The impairments of the people who seek the support of the Lebenshilfe are very diverse. People with psychological, cognitive as well as physical impairments are welcome. The services are as diverse as the interests of the people. The job opportunities alone range, among others, from sauna construction to working in an art studio, social department, or bicycle shop. The programme allows people to orientate themselves in completely different directions and to personalise their lives. In the same way, the housing offers of the Lebenshilfe are geared to the individuals' taste, and above all, their needs. The challenge of responding to each individual in the most efficient way is the daily job of the employees of the Lebenshilfe.

It is essential for me, in addition to the pioneering fight for more participation in society for people with impairments, that they can live a "normal life". This includes, for example, that in their free time they have the opportunity to obtain precisely the current information they want. Therefore, the most important thing for me is not to over-edit the texts in Easy Language. The content of current critical topics and news should remain unchanged. Above all, more leisure activities should be available in Easy Language. I teach at the Ostfalia University in Braunschweig and one of my students recently described in Easy Language how to assemble a longboard. This was received very well by the addressees and also inspired me. Exciting and up-to-date topics of everyday life should be made accessible to people with impairments so that they can live a life full of diversity and with new discoveries as well.

Stefanie Schruhl

Audio description in practice – Report by a blind recipient and audio describer

My name is Stefanie Schruhl. I am married, have a young daughter and I work throughout Germany as an audio describer for various clients who create audio descriptions for television and cinema. I am actually a certificated psychologist. But seven years ago, after several unsuccessful attempts to find steady employment, I decided to reorient myself professionally. In spring 2011, Hörfilm e.V., an association of German audio describers, was looking for a blind audio describer. They invited me to a one-day work trial in which we described ten minutes of a scene from a popular German crime series called *Tatort* starring the inspectors Batic and Leitmayr. That was a tough test. The very first film sequence already showed me how complicated moving pictures can be. In this case, the plot of the scene was really hectic: Inspector Batic was being revived while the pictures were both distorted in colour and streaked with stains and scratches. I felt challenged from the first minute of my future career as an audio describer. The chemistry between my two sighted colleagues and me was right, which is why I decided to go for training at the Bayerischer Rundfunk (Bavarian Broadcasting) to practice being an audio describer and gradually got more jobs.

At that time, there were approximately half a dozen describing teams in Germany, including the team in which I participated, and we all worked in groups of three. The first sighted describer was responsible for the film description for the blind colleague and was in charge of the remote control. The second sighted describer wrote down the resulting formulations and created the manuscript in a notebook. The second describer also spoke each finished text passage into the running film to ensure that it worked. The blind colleague played a key role in this process such as asking questions and deciding what was to be given priority after receiving the equivalent information about film

pictures. The blind colleague usually dictated the final text of the audio film sequence to the writer.

This way of working shows that every single word is critically scrutinised and reviewed by all the describers involved in the text. You will always have one question in mind: Is it understandable for the target group?

Out of the 1.2 million blind and visually impaired people in Germany, the largest and continuously growing group is people with age-related blindness. It can be assumed, for instance, that this group of people has good general as well as colour knowledge and knows what a Volkswagen Beetle looks like. Apart from that, you always have to ask yourself whether the considered word stylistically fits into the film, or if it seems unsuitable within film dialogues that have their own language. Imagine, for example, a film scene with Bud Spencer and Terence Hill fighting with and cursing at two rowdy bandits in front of a saloon, while the audio description interjects between the curses to describe the golden rays of sunshine overhead. In addition, the dialects of the audio describers should not influence the audio description. For example, a Southern dialect cannot be used in a North German radio broadcast. Thus, it can lead to heated debates when three describers work on a manuscript that is editorially re-reviewed before sending it to the speaker at the recording studio. As perfect as the individual's own formulation approach may seem to him or her, the formulation sometimes needs to be adapted in favour of the entire work and the working climate.

The greatest challenge in the creation of audio films is the oftentimes short time interval between the dialogues or other acoustic film elements, in which actually much more happens that should be described to the visually impaired viewer because pictures are always faster than the spoken words needed to convey them in all their complexity. I remember how my sighted colleague Olaf Koop described a gladiator fight in the disaster film *Pompeii* to me. In the end, we actually managed to describe 11 fights in a 22-second film passage. As a result, the plot of attack and defence could be described almost completely, but not entirely. Especially in the action genre, the audio description always remains a compromise due to the simultaneous film events, for which the recipient is probably thankful. After all, he or she has not lost track of the plot and can follow it thanks to the audio description. Nevertheless, as an audio

describer, the decision to omit something when I know all the details leaves me feeling unsatisfied.

Similar problems arise when it comes to comedy in films because there are sometimes not the right words to describe a funny scene in a way that will make the viewer laugh. My first audio film experience was *Tootsie*, a film that we watched as a school class of blind and visually impaired people in the cinema together with sighted pupils. I remember that the choice of words in the audio description made me laugh less than the laughter of the other viewers. It just sounds less funny than it looks like when someone pulls a face. This makes it one of the insurmountable limits of the audio description process.

Until I was 30, I rarely had the chance to enjoy audio descriptions. On the one hand, there were not many offers, on the other hand, you often did not know about the services offered. At most, you inadvertently stumbled across an audio film when dividing the stereo signal by keystroke and coincidentally an audio description was running on the 2nd sound channel. I experienced the dramatic scenes of the blockbuster *Titanic* through the tear-stained and sparely seeded quiet description of my friend next to me. But whispering "What is happening?" more than once was not possible in the silent cinema. I was part of the teenage hype surrounding a very popular German soap opera, called *Gute Zeiten, Schlechte Zeiten*. However, the product placement did not affect me at all due to a lack of audio description. But this is just the way it is when visually impaired teenagers in Germany, who also get pocket money, are not perceived as a consumer group. I liked sitcoms like *Roseanne* a lot because of their puns. But for many episodes, I thought that it was about a black family. After all, Regina Lemnitz is always the dubbing voice of Whoopi Goldberg, and she is also black. During my first theatre visit with live audio descriptions in the romantic comedic verse drama *Cyrano de Bergerac*, an amusing incident occurred when the speaker described to all blind visitors via headphones an action on stage which had happened during the rehearsal and logically was in her manuscript, but which now turned out completely different due to an acting improvisation. This made the speaker smile audibly and caused all the blind visitors to burst into laughter.

I enjoyed going to the cinema, but I did not go often. I watched and listened to films and series without audio description, but with a lot of imagination, and

tried to figure out for myself what was happening because I thought I had an understanding of film logic. But of course, it sometimes happened that, even after several film minutes and concentrated listening, I was still completely in the dark. For example, I once left the cinema after I was desperately trying to derive any possible storyline for half an hour from the booming and acoustic overstimulation in Steven Spielberg's *War of the Worlds*. Eventually, I settled for H.G. Wells' novel of the same title. I also returned the DVD of the war film *Saving Private Ryan* almost unseen because the whole action during the blaze of gunfire did not open up for me due to the poor audio description.

Unfortunately, even today, by no means every film or major cultural event is provided with audio description for visually impaired people. In recent years there has been at least a very positive development in which we as consumers are more obviously perceived by the film industry and in which the cultural services for blind people have also increased. Thanks to an amendment to the German Film Promotion Act in 2014, every new film production that would like to receive financial support in Germany must provide an accessible film version, including an audio description. Consequently, up to 20 audio films are now broadcasted daily on television. Thanks to the guidelines for the creation of audio descriptions, which were established in 2015 in cooperation with the nine regional public broadcasters from Germany, Switzerland, and Austria (ARD, ORF, SRF, ZDF, and the Hörfilm gGmbH, Hörfilm e.V. and audioskript), there are respective quality standards now. These guidelines ensure that an audio film is not only available, but also acceptable, and ideally even a pleasant experience for visually impaired viewers.

In addition to their regular customer support services, various public broadcasters now have special hotlines that are dedicated to the concerns of their visually impaired customers. Furthermore, there is an acoustic signal or a voice-supported text which announces the beginning of an audio film.

Only private television is still lacking technical upgrades to the second sound channel and to finally including visually impaired viewers as a relevant consumer group. Audio film versions of formats like *Germany's Next Topmodel* or boxing matches are very much being requested by my clientele.

German websites such as *TV-Butler* and *EPGDATA* as well as the web page of the TV guide *Hörzu* have an extra list of audio films in their TV programme

listings. All German-language audio productions are included in a regularly updated public databank on the homepage of www.hoerfilmev.de. The databank now contains almost 10000 entries.

Especially due to the commitment of the American film studio Universal Pictures, audio film fans cannot only enjoy German films but also new international blockbusters with audio descriptions at the cinema. There are cinemas that have installed a wireless system that enables visually impaired visitors to listen to any audio description that may be available during the screening via headphones from special seats using a lendable receiver. Nevertheless, the invention of the GRETA app by Greta & Starks, which is free for audio film users and functions independently of the cinema's technology, was the most innovative solution so far in terms of inclusion. With this application, visually impaired people can access a databank that contains the audio track with the audio description of the desired film. At the beginning of the film, the smartphone synchronises with the ongoing film sound and you can hear the audio description via headphones in any cinema and at any time. In addition, it is possible to request films for which an audio description does not yet exist.

Unfortunately, the companies have not yet managed to install a search function in their online portals that recognise the availability of an audio film version on DVDs and Blu-rays, so that I, as a consumer, could specifically look for it. In order to find an adequate product, you need to have, so to speak, Sherlock Holmes'-like intuition. Film portals such as Amazon Prime Movie and Netflix now offer audio film versions, including productions in English, but they differ in difficulty of use.

Sometimes, an audio description is produced but not purchased by the provider. It is then laid aside until someone demands it and is willing to pay for it, which particularly annoys me when I was involved in its creation as an audio describer. For example, our whole work on the previously mentioned disaster film *Pompeii* was denied to all visually impaired cinema visitors because the date of the cinema release was before the post-production was finished. In general, we audio film describers in independent film production only get to see the final result of our work if we buy the film. So, there is no free cinema ticket or DVD just because you worked on the post-production.

The concept audio describer/audio film describer is not protected and the profession itself does not provide much opportunity for growth. Those wanting to pursue a career in this field and start getting jobs have to participate in a four-day training programme. To succeed, you need to have: empathy, a good feel for language/linguistic competence, passion for precision, knowledge of dramaturgy and cinematic narrative, persistent concentration, and last but not least broad general knowledge. Other necessary skills are acquired through learning-by-doing. Participants cannot fail these training programs; the worst-case scenario is not getting any jobs from the person(s) or organisation(s) offering the programmes in Germany. Blind and partially sighted audio description fans will at most criticise inadequate productions on the platform "*Hörfilmnews*" (audio description news) which they occasionally use to give other people information about the quality of audio descriptions. More in-depth quality checks are not yet available. Theoretically, everyone could work as an audio describer, even if the person lacks talent. I cannot do much about it, except, as a blind author, refuse to corporate with these describers, or, as a recipient, I could complain to the person who commissioned the audio description. Occasionally, I prefer not to use the audio description because I cannot ignore my critical inner audio describer. What bothers me the most is when I get the impression that the author has not put enough effort into the audio description. This often results in a lack of detail (despite having enough space), no linguistic variation or badly timed and accented audio description, thus giving reason to believe the text was only recorded in the studio without a simultaneous screening of the film. In my opinion, more should be done against poor audio descriptions. The mere training of describers does not suffice, nor the development of quality standards. So far, there is no binding supervisory body and no professionalisation of audio describers.

To get to the point: we, the blind audio describers, are like pawns in a game of chess in the audio description industry. Initially, we are needed to bring the other chess pieces, the sighted newcomers, into the game. We show them how we perceive the world and sensitise them for the visible information they need to make audible, and therefore accessible for us. But sooner or later, depending on the describers' talent and the budget, the sighted chess pieces are able to excel without the pawns, and literally sweep them off the board.

There is a conflict of interests between sighted and blind audio describers. Having more describers for whom we could do editorial work would be more convenient, but it also means more competition for our sighted colleagues.

Since the introduction of the licence fee for partially sighted people a few years ago, more and more audio description providers entered the market who bragged about their non-existent experience. This led to the beginning of a price war and within a few months, the team-of-three model ceased to be used. The demand for cost-effective ways to produce accessible films increased; even the public broadcasters tried to rapidly increase their audio described services to satisfy the needs of the paying, partially sighted customers in the wake of the decision to impose the licence fee for blind and partially sighted people in 2013. As a consequence, the number of staff creating audio descriptions had to be reduced. What working method was actually used was contingent on the number of planned productions and the budget granted by the public broadcasters. With so many providers on the free market, every audio describer had to decide on a working method that suited them best. In the end, the budget of the studio that not only created audio descriptions but also produced accessible film versions determined how many audio describers and editors were involved in a project.

In my case, I was editing manuscripts for as many describers and providers as possible just to make ends meet, rather than working with a permanent team on a manuscript for several days. Although the experienced describers did stand up for us blind describers, the competition between the providers often resulted in us just doing editorial work. Nowadays, creating audio descriptions instead of just doing editorial work has become something very rare for us. Often times, we are only hired by inexperienced providers who view blind describers as a kind of safety net or providers such as the Bavarian Broadcasting (BR) company, a German public radio and television broadcaster, who considers working with blind describers as a mark of quality.

In my experience, the idealism of new audio description providers who think it is honourable to employ blind authors to help with creating an audio description manuscript from start to finish fades after the first time a competing provider offers a cheaper service and gets the job.

Everyone who finds out about the possibility of funding for new projects in this industry thinks that they are going to receive large sums of money. However, there are often too many people vying for the same opportunity, thus decreasing the chances of actually landing the desired funding. And the German Federal Film Board (FFA) only covers about 50% of the production costs. Therefore, providers who want to be politically correct and inclusive in the creation of audio descriptions but also want to earn money, go with the cheaper staff options. That means a sighted describer writes a manuscript as fast as possible and a blind one only proofreads, even better if it can be recorded cost-effectively. These savings and restrictions often negatively affect the product's quality. But I do not want to demonise someone for trying to be cost-effective, because there are also audio described film providers for whom a good audio description is a matter close to their heart – be it only for certain projects every now and then. Those rare opportunities give me the chance to describe a film together with a sighted colleague, which is a working method I really like; then I am both a reviewer and a describer. For that, a bit of multitasking is needed: when the voice output device reads out the description we have just written, while I almost simultaneously have to record the description with the film being shown at the same time. What definitely keeps me on my toes is listening to the description while writing it down as fast as possible so that I will not forget a single detail. Sometimes I am allowed to come along to the studio and take over audio direction, maybe with a few subtitles being left over for me to record – that is when my work makes me genuinely happy. The product, the audio described film, feels almost like my own child: I have contributed something from start to finish.

Today, however, audio describers like me have to put themselves out there and fight for customers to earn some money.

Currently, I am working for nine audio describers who are working for ten audio described film providers, including the Northern German Broadcasting company (NDR), where I actually do my editorial work on-site. I meet the describer who wrote the manuscript and another sighted co-worker to get approval for the audio description manuscript at the broadcasting station. This describer records the manuscript with a simultaneous screening of the film. We interrupt if we need to discuss an image or language issues and make

necessary changes. Almost a real collaboration situation like it used to be – just quicker. With other providers, I only deal with them via email. I meet most providers no more than once a year at the presentation of the "*Deutscher Hörfilmpreis*", an award ceremony for audio described films, at the cinema "*Kino International*" in Berlin.

Thanks to this marvellous event, created by the German Federation of the Blind and Partially Sighted (DBSV) 16 years ago, our work has gotten more media attention and therefore more prestige. A jury of representatives awards the prize in five categories: TV, cinema, documentary, the newly added children's and youth film, as well as an audience award. The producers of the winning film are awarded the Adele trophy, and as it turned out, some of them did not even know what an audio described film is. But it is a celebratory spectacle where we get to experience being a star for one night and also get the chance to connect with potential employers and further promote audio described films. My NDR audio description crew has already been awarded three times and I have been nominated another four times with one of my audio description teams. As I stood on stage at my first ceremony wearing a pink evening dress, the large framed certificate in my hands, smiling broadly into the camera flashes, my mother's words – which I have kept to myself so far – crossed my mind:

"When will this prize actually be remunerated?"

Rudolf Scheps

"Bureaucracy in disability law needs to be relaxed"

(recorded by Loraine Keller and Sergio Andres Hernández Garrido)

Rudolf Scheps has been volunteering at Hildesheim's district group of the Lower Saxony Federation of the Blind and Partially Sighted for almost 19 years. Due to his many years of commitment, he was elected the first chairman of the district group by his colleagues. As a partially sighted person, he supports other partially sighted people as part of his volunteer work. In addition to important events of the federation, such as the annual general meeting, he also organises events like the district group's summer party, Christmas party and the annual day trip. The main focus of his work, however, is to support the blind and visually impaired people in their concerns. As chairman of the Federation of the Blind and Partially Sighted, it is particularly important to him that this group is informed of its legal position. "Blind and partially sighted people need to know what they are entitled to", Scheps said. His volunteer work matters so much to him that he sacrifices his weekends for additional training courses and seminars. "Not only do I want to stand up for blind and partially sighted people, but also learn how to do it properly."

Scheps' volunteer work is not limited to his chairmanship of the Federation of the Blind and Partially Sighted, he also serves on the board of the Hannover Regional Federation and is a member of Hildesheim's Disability and Inclusion Advisory Board. Rudolf Scheps combines his volunteer work with his job as a telephone operator at the Roemer- und Pelizaeus-Museum in Hildesheim. He is responsible for forwarding phone calls and managing information emails for visitors for which he uses the help of a screen reader.

Barriers in everyday life

Barriers for blind and partially sighted people mainly arise in the traffic and mobility sector. Scheps points out that there are still not enough traffic lights with acoustic signals for pedestrians in Hildesheim. In addition, the grey bollards pose a danger to partially sighted people. Due to their disability, many have limited colour vision and cannot see contrasts – making the bollards difficult to distinguish from the ground. But the biggest barrier in public is people's recklessness, for most of his bad experiences have been with cyclists. They often cycle too close to the pavement and it has even happened that they hit his white stick. An unpleasant encounter is unavoidable if cyclists do not call attention to themselves either by shouting or ringing. "We have to think for other road users when they behave recklessly towards us on the road", said Scheps. "Cyclists and pedestrians occasionally make hurtful comments like 'Are you blind!?' or 'Can't you pay attention!?', even though we are just trying to be as careful as possible." Due to these types of experiences, going into public can be stressful and sometimes frustrating for Rudolf Scheps.

But not all experiences in everyday life are negative, as Rudolf Scheps emphasises. He is often offered a seat on the bus or is led to the right door by someone at the doctor's office. In his opinion, blind and partially sighted people should accept help. They are, time and again, dependent on this support. Rudolf Scheps takes it with humour: "As a blind or partially sighted person you always have to say *please* and *thank you*." Nevertheless, the help must be offered and given reasonably. "Communication is the key. Ask whether help is wanted and do not automatically assume it to be the case."

Nowadays, the Internet is also an important source of information for people with disabilities. However, Scheps warns that providers should not limit information services to this medium alone as it would exclude certain target groups such as elderly people. For Scheps himself and many other blind and visually impaired people, the Internet is extremely helpful. But during years of volunteer work he realised that for elderly people, with or without visual impairments, the Internet is difficult to use. They are not able to handle this relatively new medium properly, and therefore do not have access to information via this channel. Problems can arise if information is only accessible via the Internet.

Scheps mentions difficulties with the bank: "Account statements are now only available online. Many elderly people with visual impairments can no longer manage their accounts because some of them do not even have Internet access".

"Today's smartphones are an essential element of accessibility for blind and visually impaired people."

As a visually impaired person, Rudolf Scheps is dependent on accessible services. He is enthusiastic about audio descriptions on TV and in cinemas. These accessible media services work excellently today and Scheps has seen a great improvement. For him, a screen reader, such as for example JAWS, is indispensable at work and in his everyday life. Such software applications, which he uses for his computer, are very valuable for the inclusion of blind and visually impaired people in a digitalised world. However, he thinks that the expansion of this technology has resulted in Braille losing its importance as voice outputs are faster and easier to perceive. Even though Braille is still being taught nowadays, it is no longer frequently used.

With voice output, smartphones have become a great help in everyday life for blind and visually impaired people. The auditive reproduction of information on smartphones actually reduces barriers for them. However, people with other impairments, like hearing impairments, cannot use this technology to obtain information and it can even become an obstacle. The devices and applications have now reached an outstanding level and are very user-friendly. This means that Rudolf Scheps can use his smartphone not only to communicate via instant messaging but can also access information on the Internet at any time – just like anybody else: "Smartphones have become irreplaceable for blind or visually impaired people like me."

A request for a more relaxed bureaucracy

Scheps thinks that bureaucracy in disability law is often a barrier. He advocates for bureaucracy to be reduced and to focus more on the actual needs of

the people. As an example, Scheps mentions that inclusion classes in schools should not be subject to official requirements. More should be done to find out under what circumstances inclusion can work in class. In his opinion, the processing of applications such as the issuing of a disability card or the application for blind person's allowance should not be as complicated and lengthy as it is right now. The application assessments are usually associated with long waiting times, even for urgent issues.

The fact that many blind or visually impaired people are not sufficiently informed about their rights makes the situation more difficult. If, for example, applications are not approved in the first instance, many applicants think that they cannot do anything about it. Scheps considers it extremely important to inform blind and visually impaired people about their rights. For example, in the case of a rejected application they should know that they often have the right to file an appeal. Therefore, Rudolf Scheps works hard every day to overcome and reduce bureaucratic barriers for blind and visually impaired people.

Oxana Kulikova and Gökhan Şilfeler

Spoken Plain Language in DaZ lessons

(recorded by Sergio Andres Hernández Garrido)

Oxana Kulikova and Gökhan Şilfeler are German as a second language (DaZ) teachers at the German Employees Academy Hanover (DAA) in Hildesheim. Oxana Kulikova is originally from Russia, where she studied English and German. After moving to Germany 20 years ago, she worked as a foreign language teacher and translator for English, German and Russian. For twelve years, she has been primarily involved in DaZ lessons ranging from literacy courses to C2 level at the Adult Education Centre in Hildesheim and the DAA. Gökhan Şilfeler comes from Turkey and studied German Language and Literature as well as Turkish Studies in Göttingen. He has been teaching EDP (Electronic data processing) and DaZ courses at the DAA since 2007.

Students with different backgrounds

Kulikova and Şilfeler work with a very heterogeneous group of students. For example, some of the young people who are sitting in these classes come from abroad and want to study or start vocational training in Germany. Some students with a bachelor's degree also attend these language courses because they need a C1 or C2 level certificate for their further education in Germany. However, the majority of the class participants are migrants who had to flee their home countries due to the conflict in the Middle East and now have to reach a B1 level in German within a time period set by the Federal Office for Migration and Refugees (BAMF).

The DAA assigns the DaZ students into different courses depending on their language level and competence. The so-called literacy course is

designed for people who either have no written language competence in their own mother tongue or who have to learn a new alphabet before they can start the actual German classes. According to BAMF regulations, refugees have to reach this level within 900 hours of teaching time, which could be extended by 300 hours, if necessary. This is followed by integration courses in which they are expected to reach level B1 within 600 hours. Furthermore, orientation classes that consist of 100 lessons serve as preparation for the naturalisation test. These classes focus on expanding the students' vocabulary and their knowledge about society and politics. In addition, the DAA also offers lessons for job-related language support, ranging from B2 to C2 level. Oxana Kulikova and Gökhan Şilfeler are teachers for all these types of courses and levels.

"We must use a variety of tools to achieve our goals."

The time period in which the students attend the literacy, integration and orientation courses and by which they need to reach a B1 level, is set by the Federal Office. For Şilfeler, the determined time frame is too short for this objective: "We worked under enormous time pressure, because the material that has to be covered is too much for the scheduled teaching hours." Many of the students have to acquire a basic linguistic competence in the literacy course, which they do not even have in their mother tongue. For others it is a great challenge to learn a new alphabet and to use it appropriately. Only after this process can the actual German lessons begin, in which the students have to reach the B1 level within 600 hours. There is no time left for detailed examinations of German grammar, which should actually take place within the integration courses.

Gökhan Şilfeler: "The restricted time frame for reaching the B1 level complicates our work a lot. But there are also external factors outside the classrooms, which can have a negative impact on the learning process. Some of our students have fled Syria and left behind family and relatives. I can fully understand when their personal situation sometimes does not allow them to focus in class or

while studying at home, because their thoughts are with their relatives in their home countries. Others are in a classroom for the first time in their lives. They do not know how to learn a language or how to work on it at home on their own initiative. In their everyday life they not only have to learn the German language, but also take care of an apartment or deal with bureaucratic matters. These factors influence the learning process of our students. We try our best to deal with all topics within the set time, but due to these influencing factors it is a great challenge to motivate our students as needed. The time pressure aggravates it even more."

Oxana Kulikova and Gökhan Şilfeler must overcome these difficulties and achieve the goals within the hours set by the BAMF. For this, they use different tools.

Oxana Kulikova: "For example, I like to work with flashcards in vocabulary exercises. The front shows pictures or words in German that come up in certain topics discussed in class. I prepare them before the lesson so that my students can write the translation in their own mother tongue on the other side of the cards. I keep these flashcards in the classroom so that they can practice vocabulary at any time. I use this tool especially in the literacy courses.

The communication with my students when preparing a topic is very important for me. It makes no sense for me to just stick to the textbook without knowing the level of knowledge of my class. Together we discover what basis already exists, and then we can build on it. For instance, in one of my orientation courses we had to deal with the political system of Germany. Most of the students already knew the name *Angela Merkel*. I used Chancellor Angela Merkel as a starting point for explaining the political system. The result was a poster that now hangs in the classroom as a learning aid."

Both DaZ teachers share the same opinion that vocabulary lists with translations into several languages and PowerPoint presentations as visual support are very helpful, as is the use of Plain Language by teachers in their lessons.

"We try to explain everything as clearly as possible."

Oxana Kulikova and Gökhan Şilfeler use spoken Plain Language in their classes with the intention of explaining facts as clearly as possible and to progress with the subject matter faster and more efficiently. Especially in the literacy courses, they try to use a simplified form of German to communicate with their students.

Gökhan Şilfeler: "As teachers, we try to explain a lot in Plain Language, especially when it comes to topics related to German history and politics. In our experience, complex historical events such as the fall of the Berlin Wall or the Nazi era are difficult to understand for most of our students. By simplifying and explaining the terms, we make better progress when learning the topic."

However, Oxana Kulikova has already experienced that her students reject the use of a simplified version of German in advanced courses and occasionally even in literacy courses.

Oxana Kulikova: "I often do oral exercises in which the students have to form very simple sentences in terms of grammar and sentence structure. For example, I set the task that they have to talk about their everyday life using main clauses such as 'I go home'. Sometimes my students found the exercise ridiculous because it seemed too easy and they did not want to actively participate, as if it were some kind of insult to them. They also did not like being corrected, because they found the initial sentences too simple."

The use of texts in Easy Language in DaZ lessons

Oxana Kulikova and Gökhan Şilfeler do not use texts in Easy Language as an aid in DaZ teaching. In the teachers' opinion, the use of this aid would be partly contradictory in language learning, as Easy Language is a simplified variety of German. According to its rules, this variety excludes subordinate

clauses, passive constructions or the genitive, however, all of these belong to language acquisition.

Nonetheless, in orientation courses, which are mainly concerned with building general knowledge and vocabulary, texts in Easy Language could be helpful. They could also be helpful in conveying complex facts about German politics and society in these courses. According to Kulikova and Şilfeler, the textbooks used in these courses are too complicated for the students.

Gökhan Şilfeler: "When discussing the texts, we try to make them as comprehensible as possible for the students by using a simplified form of German. The linguistic difficulty of the texts does not correspond to the objective of the course. Participants have to be prepared for the naturalisation test in only 100 hours; this would be easier to achieve with texts in Easy Language."

Oxana Kulikova: "In this regard, the textbooks could be revised and improved for the orientation courses. We clearly need more texts in Easy Language that could be used to achieve the objectives set in the orientation courses."

The authors

The biographical information on the authors has been translated from the original handbook (as of summer 2018), unless the authors have sent us an update in the course of the translation project.

Kerstin Alexander, Hochschule Merseburg, Professor of Technical Illustration and Graphic Design. Research interests: Accessible graphic design, typography and image comprehensibility in the field of Easy Language.

Dana Apel, Landesbildungszentrum Hildesheim, pedagogical consultant and Sign Language teacher, lecturer of German Sign Language.

Jörg Apel, independent lecturer for Sign Language. Sign Language teacher at the University of Hildesheim and at the Hildesheim University of Applied Sciences and Arts (HAWK) as well as at other institutions.

Antje Baumann, Dr., German Federal Ministry of Justice and Consumer Protection Berlin, linguist for legislative editing. Research interests: Comprehensibility and text types, variants of language use, political aspects of language change.

Bernd Benecke, Dr., Bayerischer Rundfunk: Head of Audio Description within the Access Services Department. Lecturer at the Baden-Wuerttemberg Cooperative State University (DHBW) and at the International University SDI, Munich. Doctoral thesis on audio description as partial translation ("Audiodeskription als partielle Translation").

Uta Benner, Heidelberg University of Education, Professor of Sign Language Interpreting. Research interests: Inclusion, participatory research, sign language interpreting.

Bettina M. Bock, University of Cologne, Professor of Applied Linguistics in the Context of Inclusion and Exclusion at the Department of German Language and Literature II. Research interests: Easy Language, text and discourse linguistics, sociolinguistics, comprehensibility research, language didactics and inclusion/exclusion.

Ursula Bredel, University of Hildesheim, Professor of German Language and Didactics. Research interests: Orthography/didactics of orthography, grammar/didactics of grammar, Easy Language in the context of inclusive schooling.

Dino Capovilla, University of Würzburg, Professor of Pedagogy for Visual Impairment and Blindness as well as General Special and Inclusive Education. Research interests: Living conditions of persons with disabilities in the tradition of disability rights movements, participation through technology and interdisciplinary didactic approaches in inclusive classrooms.

Ursula Christmann, retired (apl.) Professor at the Institute of Psychology at Heidelberg University; Research interests: Reading comprehension, psychology of reading, language psychology, communication psychology, figurative language.

Julia Dobroschke, Dr., specialist in the area of accessible information and communication offers at the German Centre for Accessible Reading (dzb lesen).

Kristian Folta-Schoofs, University of Hildesheim, Professor of Neurodidactics. Research interests: Accessible and inclusive learning designs, accessible communication, multilingualism, attention and working memory.

Norbert Groeben, Univ.-Prof. retired General and Cultural Psychology University of Cologne, General Literary Studies Heidelberg University and University of Mannheim. Research interests: Psychology of cognition, language and literature; theory of science and anthropology; literature and media science.

Silke Gutermuth, Dr., Johannes Gutenberg University Mainz, researcher in the TRA&CO Center at the Faculty of Translation Studies, Linguistics and Cultural Studies in Germersheim. Research interests: Translation process research, eye tracking, reception research in the field of Easy Language.

Silvia Hansen-Schirra, Prof. Dr., Johannes Gutenberg University Mainz, Professor of English Linguistics and Translation Studies and Director of the TRA&CO Center at the Faculty of Translation Studies, Linguistics and Cultural Studies in Germersheim. Research interests: Empirical translation studies, specialised expert communication, intralingual translation, machine translation, multi-media translation.

Uschi Heerdegen-Wessel, Norddeutscher Rundfunk (NDR), head of access services and NDR teletext. Responsible for NDR production of subtitles, audio descriptions, Sign Language and Easy Language offers as well as coordination of the ARD project group for accessible broadcasting.

Franziska Heidrich-Wilhelms, Dr., University of Hildesheim, lectures and research. Main research areas: Translation Studies, Specialised Translation Process Research, Specialised Communication Studies, Comprehensibility Studies, optimisation and efficiency of technical and non-technical communication.

Jan Hellbusch, Accessibility Consulting, Dortmund. Functions: Assessment creation, workshops and consulting in the field of digital accessibility.

Johannes Hennies, Heidelberg University of Education, Professor of Deaf and Hard-of-Hearing Pedagogy. Research interests: Bimodal-bilingual education, acquisition of written, spoken and sign language (in children with or without a hearing disability), inclusive didactics, history of deaf people and people who are hard of hearing.

Annika Herrmann, Institute of German Sign Language and Communication of the Deaf, University of Hamburg, Professor of Sign Languages and Sign Language Interpreting, Director of the institute and programme coordinator for the BA and MA programmes Sign Languages and Sign Language Interpreting. Research interests: Sign Language linguistics, theoretical and experimental sign language research, sign language interpreting.

Janna Hinrichs, Lebenshilfe Braunschweig, linguist, Director of the Braunschweig office for Easy Language.

Thomas Kahlisch, Director of the German Centre for Accessible Reading (dzb lesen), honorary professor at Leipzig University in the area science of books, accessible media design.

Oxana Kulikova, Deutsche Angestellten-Akademie Hannover in Hildesheim, teacher for German as a second language, licensed examiner for German levels B1 to C2.

Alexander Kurch, VerbaVoice GmbH, speech-to-text interpreter, (live) subtitler, audio describer, post-editor for speech synthesis of artificial voices, independent researcher, independent lecturer, coach and examiner of accessible audiovisual translation. Research interests: Synergies of accessible communication in combination with language technologies and machine learning (language recognition, machine translation, speech synthesis incl. post-editing), translation process research (eye tracking, key logging) and quality assurances in accessible audiovisual productions.

Katrin Lang, Dr., Berlin, online editor at Duden publishing house. Previously employed in the German Federal Ministry of Justice and Consumer Protection as a legislative editor and language consultant. Doctoral thesis on accessible online communication in public offices at the Research Centre for Easy Language. Research interests: Accessible legal communication.

Benedikt Lutz, Dr., University for Continuing Education Krems, head of programmes in the fields of knowledge, process and quality management. Research interests: Expert communication in professional environments, knowledge management, comprehensible legal and administrative language.

Christiane Maaß, University of Hildesheim, Professor of Media Linguistics in the Department of Translation Studies and Specialized Communication; Director of the Research Centre for Easy Language. Authorised expert for the Federal Government's Accessibility Initiative. Head of the accessible health communication section of the German Network for Health Literacy. Research interests: Accessible communication, in particular Easy Language in the context of linguistics and translation studies.

Laura Marie Maaß, Dr., doctorate in sign language interpreting (University of Mainz). Lecturer at the University of Hildesheim, certified interpreter for German Sign Language and Easy Language. Authorised expert for the Federal Government's Accessibility Initiative. Research interests: accessible communication in specific fields of action (educational settings, culture, politics and health).

Nathalie Mälzer, University of Hildesheim, Professor of Transmedia Translation. Research interests: Accessibility and inclusion in aesthetic communication (film and theatre); rhythm in translation; literature, comic and audiovisual translation.

Oliver Musenberg, Humboldt University of Berlin, Professor of Pedagogy with a focus on Cognitive Disability in the Department of Rehabilitation Sciences. Research interests: Inclusive (specialised) classrooms; education and severe disabilities, disabilities from an educational-historical and cultural perspective.

Conchita Otero Moreno, Dr., University of Hildesheim, research assistant in the Department of Translation Studies and Technical Communication. Court interpreter for Spanish and co-founder of the international research group Alfaqueque (campus.usal.es/~alfaqueque/). Multi-year research and teaching stays at the Universidad de Salamanca (Spain). Research interests: Commu-

nity interpreting, language and culture mediation in international contexts, interpreting studies.

Cornelia Plagge, Lebenshilfe Braunschweig, auditor of Easy Language texts.

Nicola Pridik, jurist and owner of the office for clear legal communication in Berlin (www.npridik.de). Interests: Comprehensible preparation of legal information (words and images), focus on legal visualisations.

Isabel Rink, Dr., University of Hildesheim, programme coordinator of the Master's programme Accessible Communication and lecturer at the Department for Translation Studies and Specialised Communication. Research interests: Easy Language in expert communication, accessible communication.

Johannes Schädler, University of Siegen, Professor of Social Pedagogy with a focus on inclusion and planning, manager of the Zentrum für Planung und Evaluation Sozialer Dienste (ZPE). Research interests: Modernisation of services for persons with disabilities, individual and local participation planning, social services in a European comparison, development cooperation and social services.

Rudolf Scheps, first chairman in the Hildesheim regional group of the Blinden- und Sehbehindertenverband Niedersachen e.V.; board member of the regional association Hannover and member of the Hildesheim municipal advisory board for people with disabilities and inclusion. Staff member in the Römer- und Pelizaeus-Museum Hildesheim.

Thomas M. Schindler, Dr., Boehringer Ingelheim Pharma GmbH & CoKG, Head of Innovation Medical Writing, lecturer at the Hochschule Biberach, research interests: Plain Language and Easy Language in medical-pharmaceutical communication, aspects of numeracy in the communication of specialised topics, theory and practice of writing scientific and regulatory texts.

Stefanie Schruhl, author and author of films for the hearing-impaired for television and cinema productions, three-time winner of the Deutscher Hörfilmpreis.

Swenja Schum, University of Hildesheim, research assistant and lecturer in the Department of Translation Studies and Technical Communication. Research interests: Forms of translation in museums and art exhibitions with regard to their potential for dismantling various language and sensory barriers.

Saskia Schuppener, Leipzig University, Professor of Pedagogy in Intellectual Disabilities. Research interests: Inclusive higher education & Disability education, Easy Language and communicative accessibility, participatory research, inclusive school development, diagnostics in inclusive schools, challenging behaviour of children, adolescents and adults with intellectual and developmental disability, restrictions on autonomy and custodial measures.

Marie-Luise Schütt, Dr., University of Hamburg, postdoc of the ProfaLe project "Professional teaching for the promotion of specialist learning under constantly changing social conditions" (Quality campaign education of teachers), Service Director InkluSoB – Inclusive and Barrier-Free Schools, research interests: Barrier-free schools and universities.

Volker Sieger, Dr., Director of the Disability Rights Office, member of the scientific board that authored the German Federal Government's three participation reports on the life situations of people with disabilities.

Gökhan Şilfeler, Deutsche Angestellten-Akademie Hannover in Hildesheim, teacher for German as a second language.

Thomas Widmayer, Lebenshilfe Braunschweig, office assistant in the Braunschweig Office for Easy Language.

Jutta Witzel, certified speech-to-text interpreter, translator/interpreter for Plain Language in the area accessible communication at, among others, court, events and in German Federal Authorities. Lecturer for text-to-speech interpreting at the SDI Munich and the University of Hildesheim.

Christa Womser-Hacker, University of Hildesheim, Professor of Information Science and Director of the Department of Information Science and Natural Language Processing. Research interests: (Culture-focused) Human-Computer Interaction, Cross-Language Information Retrieval, information behaviour.

Maria Wünsche, Dr., research assistant at the Department of Translation Studies and Technical Communication at the University of Hildesheim and freelance translator and theatre surtitler. Research interests: Comprehensibility and translation, accessible communication, theatre translation.

Christiane Zehrer, substitute Professor at the Magdeburg-Stendal University of Applied Sciences, previously numerous years as a project director in software development, design thinking facilitator and agile coach. Research interests: Software support for accessible communication, cognitive-linguistic approaches and multi-modality.

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Accessible communication comprises all measures employed to reduce communication barriers in various situations and fields of activity. Disabilities, illnesses, different educational opportunities and/or major life events can result in vastly different requirements in terms of how texts or messages must be prepared in order to meet the individual needs and access conditions of the recipients of accessible communication.
This handbook examines and critically reflects accessible communication in its interdisciplinary breadth. Current findings, proposed solutions and research desiderata are juxtaposed with reports from practitioners and users, who provide insights into how they deal with accessible communication and highlight current and future requirements and problems.

Christiane Maaß, University of Hildesheim, is the Professor of Media Linguistics in the Department for Translation Studies and Specialized Communication and head of the Master's programme Accessible Communication. She is also the Director of the German Research Centre for Easy Language.

Isabel Rink, University of Hildesheim, is a tenured lecturer at the Department for Translation Studies and Specialized Communication. She is the Programme Coordinator of the Master's programme Accessible Communication.

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