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Universitat Autònoma de Barcelona

Departament de Traducció i d'Interpretació

Doctorat "Traducció i Estudis Interculturals"

Easy audiovisual content for all:

Easy-to-Read as an enabler of easy, multimode access services

Doctoral Thesis

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This dissertation is a compendium of five articles. In order to avoid changing the numbering of the tables and figures in the original articles, the same numbering has been kept, and the number of each chapter has been included.

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Chapter 1. Introduction

This PhD focuses on Easy-to-Read as an access service. The term Easy-to-Read has been written across the PhD in several ways. The main reason is the lack of consensus among experts, as revealed by the literature reviewed. Furthermore, the compound term Easy-to-Read is currently used with different functions and to express different yet related meanings.

Firstly, Easy-to-Read is used as an adjective compound in English and is thus hyphenated or not according to its position (Aarts, 2010; Merriam-Webster, 2020). Secondly, Easy-to-Read is used as a compound noun to describe a text simplification method that includes a set of recommendations and guidelines to make content easier to read and understand (International Federation of Libraries Associations and Institutions [IFLA], 2010; Inclusion Europe, 2009; Saggion, 2017; Plena Inclusión Madrid, 2018). Finally, this compound noun is also found in the literature to describe a functional, regulated language variety (Bredel & Maaß, 2016).

The issue is not new in audiovisual translation (AVT). The different spellings and functions of the compound 'Hard-of-Hearing' or 'Hard of Hearing', and of 'voice-over' and 'voiceover' are well-known examples. Given the fact that the articles in this PhD were published during a period of time that produced different writing and followed specific editorial rules, it is impossible at this stage to unify the writing across the text. For this reason, this PhD uses the form Easy-to-Read in Chapters 1, 7, and 8, in order to support reading and avoid ambiguity.

'Less is more' is a statement that we easily tend to agree with. However, 'simple is more' might be a better saying. Less becomes more when a speaker gets to the point quickly, but more is more when a teacher takes the time to explain things in detail to a student. So, what type of 'less' leads to 'more'? Is it the number of words, the time invested, or the way a message is constructed? This PhD explores this question with regards to audiovisual content. By doing so, it studies how Easy-to-Read can be used to simplify audiovisual content to make it more accessible for people with reading and learning difficulties.

The ability to participate and perform on an equal basis in our knowledge society is subject to the equal provision of accessible technology, content, and services for all (Greco, 2016). Indeed, offering accessible content is a statutory and societal need: Article 9 of the Universal Declaration of Human Rights, adopted by the United Nations General Assembly (UNGA), states that everyone has the right to freedom of opinion and expression (UNGA, 1948). The declaration also specifies the right to seek, receive and share information and ideas through any media (e.g., printed, digital) and across frontiers (i.e., physical, technological).

Access to physical and virtual environments, information, and technologies is recognised as a principle in the Convention on the Rights of Persons with Disabilities (CRPD). Moreover, accessibility is considered to be an enabler of other rights (e.g., freedom of expression, education, enjoyment) (UNGA, 2006). Thus, a lack of physical, digital or other kinds of accessibility puts those who cannot participate in this part of life at risk of exclusion. (Arias-Badia, 2019; European Commission, 2010; European Parliament, 2016; Inclusion International, 2009; Johansson, 2016; Tomljenović, 2018; UNGA, 2006).

In the field of audiovisual translation (AVT), modalities have arisen to mediate content that would otherwise remain inaccessible for audiences with specific needs. For instance, audio subtitling, audio introductions and touch tours are useful services for people with sensory impairments for whom visual materials are inaccessible. In live contexts, such as opera, semi-automated audio descriptions are being offered at some theatres (Orero et al, 2019). For those who cannot access the audio or do not understand a particular language, subtitling provides alternative access, as do sign language interpreting, vibrating chairs or induction loops. Lastly, relaxed performances have become a suitable option for those who have difficulty following behavioural conventions. However, in spite of these numerous options, there are still needs to be catered for as in the case of those who have difficulties understanding content.

Persons who experience difficulties making meaning out of content are a heterogeneous group of individuals with varying reading, writing, and understanding abilities. This part of the population includes, for instance, those with low levels of literacy, intellectual disabilities¹, dyslexia, aphasia, temporary impairments, or limited language skills (e.g., second-language learners, immigrants, and displaced populations). Finally, the elderly can also fall into this category, for they are affected by

¹ Worldwide, 60 million persons are living with intellectual disabilities (Inclusion International, 2019).

a measurable cognitive, physical, or sensorial decline with age (Murman, 2015; Ruer, Gouin-Vallerand, Zhang, Lemire, & Vallières, 2015; World Wide Web Consortium [W3C], 2018). Despite the wide range of profiles, they all experience comprehension barriers and struggle when making meaning out of content.

Statistics from international organisations help to expose the number of persons affected. A total of 750 million adults are either illiterate or have low literacy levels, according to the UNESCO Institute for Statistics (2017). Amongst them are persons with disabilities, who account for 15% of the world population², and have been identified as having a higher risk of illiteracy (UNESCO Institute for Statistics, 2018). This number translates into 1-3% (75 to 225 million people) in the case of persons with intellectual disabilities (Special Olympics, 2016).

The numbers concerning the elderly and migrants are also high. Estimates indicate that persons aged sixty-years-old or over will reach 2 billion worldwide by 2050 (World Health Organisation, 2018). Lastly, in the fourth quarter in 2018, migrants accounted for 144,166 arrivals of non-EU citizens to Europe (International Organization of Migration [IOM], 2019). This group represents those who face communication barriers, especially upon arrival in the host country.

Easy to Read (E2R) is a text simplification, guideline-based method that enables access to written content for this heterogeneous group of people with reading and learning difficulties (IFLA, 2010; Inclusion Europe, 2009; Saggion, 2017; Plena Inclusión Madrid, 2018). The development of E2R was started by the American movement People First in the 70s. As an inclusion method, E2R can be defined as (IFLA, 2010, p. 6):

"easy-to-read" [...] means a linguistic adaptation of a text that makes both reading and comprehension easier. The aim of easy-to-read publications is to present clear and easily understood texts appropriate for different age groups. To achieve such a product, the writer/publisher must take into consideration content, language, illustrations, as well as graphic layout.

² World Bank Group: 7.6 billion people in 2018: <https://data.worldbank.org/indicator/sp.pop.totl>

In 1997, IFLA published the first issue of guidelines for Easy-to-Read materials to fulfil their role of libraries as gateways to knowledge and culture. The preamble of the 2010 edition *Guidelines for easy-to-read materials*³ outlines that E2R readers share similar needs “to a great extent” and that cooperation across-countries is possible (IFLA, 2010, p. 5). Interestingly, these guidelines mention the same target groups as the aforementioned ones, and underline the suitability of E2R content for all of the main age groups: adults, young adults, and children.

In 2009, the user association Inclusion Europe published a set of guidelines entitled *Easy to Read guidelines Information for All - European standards for making information easy to read and understand*⁴. The concept of E2R, and the underlying principles presented in *Information for All*, converge with those described by the IFLA. While both guidelines overlap in their recommendations for written information, those about audiovisual (AV) content are more specific in the publication by inclusion Europe. This is why they have been prioritised in this thesis.

This PhD aims to contribute to developing access to audiovisual content for persons with reading and learning difficulties by putting forward easy access services, such as Easy to Read subtitles or audio descriptions. It is claimed that AV translations that follow the principles of the Easy to Read method tend to be easier to understand for all, but especially for those with reading and learning difficulties. The new and expected easy access services should expand the AVT landscape and support participation in society on an equal basis, as requested by the CRPD. Furthermore, it seeks to promote the recognition of new translation experts on Easy-to-Read audiovisual content.

This thesis comprises five, peer-reviewed publications. The methodology used is descriptive: it attempts to portray the current situation in AVT with regards to the use of Easy-to-Read in translation, specifically away from a prescriptive or speculative approach (Tourey, 1995, 2012; Williams & Chesterman, 2002).

³ <https://www.ifla.org/publications/guidelines-for-easy-to-read-materials>

⁴ The guidelines are an output of the projects Pathways I and II, and have been translated into fifteen languages. <https://easy-to-read.eu/european-standards/>

The methodology in this PhD also draws on applied research (Williams & Chesterman, 2002). By doing so, it borrows concepts from related fields, i.e., audiovisual translation, text simplification, and digital accessibility. Articles 1, 2, and 3 explore secondary sources to gain a better understanding of what E2R access services are and how they can be described within AVT. Article 4 and 5 are case studies of a single unit of investigation (Williams & Chesterman, 2002; Saldanha & O'Brien, 2014). While Article 4 identifies parameters for creating E2R subtitles, Article 5 explores the reception of E2R subtitles by end-users with reading and learning difficulties.

This PhD is categorised as an initial contribution to a field that has not been researched before: Easy-to-Read audiovisual content (Di Giovanni, 2016; Saldanha & O'Brien, 2014). Although results from initial contributions may be less conclusive, the insights gained allow for identifying issues related to the initial idea and outlining avenues for development (Singh, 2007). The initial idea studied in this thesis is that Easy-to-Read can be used to simplify audiovisual content to make it more accessible for people with reading and learning difficulties.

This thesis is registered in the PhD programme in Translation and Intercultural Studies (Doctorat en Traducció i Estudis Interculturals) at the Department of Translation, Interpreting and East Asian Studies (Departament de Traducció i d'Interpretació i d'Estudis de l'Àsia Oriental) of the Universitat Autònoma de Barcelona.

1 PhD structure

This five-article thesis explores how Easy-to-Read can be integrated into audiovisual translation to enable access to content for persons with reading and learning difficulties. To this end, a descriptive approach was followed. The first three articles draw their conclusions from secondary sources, both academic and experience-based, while the last two are case studies that allow for the collection of primary material (Williams & Chesterman, 2002). All articles have been published in international peer-reviewed publications in the field of Translation Studies and are presented in chronological order of creation.

Article 1, entitled *Easy to Read as Multimode Accessibility Service*, was published in the journal *Hermeneus Revista de Traducción e Interpretación*⁵ in 2019. The paper studies whether Easy-to-Read serves a similar function to audiovisual access services. The literature reviewed supports the hypothesis that E2R and access services share an aim: to provide content for users who cannot access it in its original form. It was also shown that E2R and access services use language functionally, i.e., the use of the language is not random and aims to fulfil the purpose of the service instead. For instance, while language in audio description is more descriptive and richer, in E2R an informative style and the use of common words would be the preferred choice. Lastly, the exploration also revealed that E2R can be used in both modes, aural and visual, and for digital formats, such as audiovisual products.

Article 2 was titled *Easier audio description: Exploring the potential of Easy-to-Read principles in simplifying AD*. In 2020, the paper was published as a chapter in the yearbook of the International Association for Translation and Intercultural Studies⁶. The study explored the practicability and outcomes of adding a layer of Easy-to-Read to existing workflows and took audio description as a case in point. The secondary sources reviewed support the hypothesis that Easy-to-Read can be integrated in AV translation workflows. The exploration also revealed that the shift in focus, from sensory to cognitive accessibility in easier audio descriptions, may ascribe them characteristics that distinguish them from their standard counterparts. For instance, the language used in an easy audio description may be more informative and less

⁵ <https://revistas.uva.es/index.php/hermeneus/index>. Article: <https://doi.org/10.24197/her.21.2019>

⁶ <https://www.iatis.org>

descriptive than in standard AD. Lastly, intonation in easy AD may also be more expressive, and the delivery speed slower, as suggested in the literature reviewed.

Article 3, *New taxonomy of easy-to-understand access services*, was published in the translation journal *Monografías de Traducción e interpretación (MonTI)* in 2020. The exploration drew upon Gottlieb's semiotically-based classification to investigate the identity of E2R audiovisual translations compared with their standard counterparts. Based on Gottlieb's taxonomy, it was possible to describe access services that use text simplification methods (i.e., Easy-to-Read, Plain Language, or Easy Pictogram) as inspirational translations that use language in a non-standard way and act as text enhancers. As such translations, they elaborate, omit, or add content to keep viewers on track, or, in other words, avoid coherence breaks. The paper supports the hypothesis that access services that use simplification methods have their own identity, and provides a first taxonomy for their classification.

Article 4 and 5 aimed to study the reception and acceptance of Easy-to-Read content by persons with learning and reading difficulties. The current lack of detailed guidelines to create access services that use Easy-to-Read led to a two-step process. Article 4, *Identifying parameters for creating Easy to Read subtitles*, was the first step. The paper explored the departing hypothesis that existing guidelines for subtitling share parameters with those of Easy-to-Read. The two reference documents used to identify creation parameters were the Spanish standard for intralingual subtitles for the Deaf and Hard-of-Hearing (SDH) and the Easy-to-Read guidelines by Inclusion Europe. The comparison generated a set of sixteen parameters for production that are mentioned in both guidelines and three parameters that emerged from the E2R guidelines. The article was published in the scientific journal *Studies on Communication and Linguistic and Cultural Mediations* in 2019.

Finally, Article 5, *Validation of Easy-to-read Subtitles*, was published in *Translation Studies and Information Technology - New Pathways for Researchers, Teachers and Professionals*⁹ in 2020. The small-scale study concerned the reception of Easy-to-Read subtitles created for a 360° opera experience within an EU project, Immersive Accessibility. The aim was to assess their usefulness through end-user validation. The validation scheme used was the five-stage procedure proposed by Plena Inclusión

⁷ <https://web.ua.es/es/monti/>. Article: <https://doi.org/10.6035/MonTI.2020.12.12>

⁸ <http://comejournal.com/rivista/numeri/>. Article: <https://bit.ly/2Zxa0Hy>

⁹ Publication: <https://sc.upt.ro/attachments/article/450/New%20pathways.pdf>

Madrid for written texts which was slightly adapted to the audiovisual format of the stimuli. Results support the hypothesis: Easy-to-Read subtitles can help viewers with reading and learning difficulties to understand audiovisual content.

2 Research question, objectives, and hypothesis

This PhD revolves around a research question: whether Easy-to-Read can be used to simplify audiovisual content to make it more accessible for people with reading and learning difficulties. The research question was inspired during the author's M.A. thesis research about the development of Easy-to-Read digital products according to the Human-Centred Design methodology (Bernabé, 2017). The preliminary evidence gained at that time stemmed from secondary sources and interviews with E2R stakeholders¹⁰. The results outlined the effectiveness of Easy-to-Read for audiences with reading and learning difficulties and also a lack of E2R texts in general and audiovisual ones in particular.

These outcomes led to the hypothesis proposed in this PhD: that Easy-to-Read can make audiovisual content more accessible for all, but especially for persons with reading and learning difficulties. Williams and Chesterman (2002, p. 76, 75) categorised this type of hypothesis as “descriptive” for it attempts “[...] to generalised, not to explain”.

The following specific objectives (O1-O5) were set out to test the hypothesis:

- O1. To explore** whether Easy-to-Read serves a similar function to that of audiovisual access services.
- O2. To explore** whether the E2R recommendations and guidelines by Inclusion Europe and IFLA can be integrated into existing workflows in the case in point of audio description.
- O3. To classify** translations that use text simplification methods (graphical or textual) within AVT according to Gottlieb's classification, and to provide a first taxonomy.
- O4. To identify** a set of parameters for the creation of E2R subtitles by merging parameters from E2R guidelines and from standard subtitling guidelines.
- O5. To assess** reception of E2R subtitles by end-users with reading and learning difficulties.

¹⁰ End-users, users' associations, publishing houses, scholars.

The five hypotheses, H1 to H5, behind these specific objectives were:

- H1.** Easy-to-Read acts as an access service.
- H2.** Easy-to-Read guidelines and recommendations can be used to create access services that enable access to audiovisual content for persons with reading and learning difficulties.
- H3.** Easy-to-Read translations are inspirational according to Gottlieb's classification. The semantic identity of Easy-to-Read translations is different to that of the standard access services.
- H4.** Easy-to-Read guidelines and current subtitling guidelines already share recommendations that can be merged to set out a list of parameters in order to create Easy-to-Read subtitles.
- H5.** Easy-to-Read access services—in short, easy access services—can improve the readability of audiovisual content and support understandability.

3 Theoretical framework

This PhD thesis can be located in the field of Translation Studies (TS), a discipline that moves away from the idea of translations as word-for-word copies of ‘untouchable originals’. To the contrary, Translation Studies allows scholars to study “all that translations CAN, in principle, involve” (Toury, 1995, 2012 p. 9). Put differently, TS enables scholars and professionals to regard translations as detached from the dichotomy source text/target text (Gambier, 2013; Toury, 1995, 2012).

Audiovisual translations fit into this theoretical framework, for they result from a process that goes beyond a linear, “interlingual, conventionalised and isosemiotic” transfer (Chaume, 2002; Gottlieb 2005, p. 43; Matamala & Orero, 2013; Perego, 2005). In fact, as a discipline, Audiovisual Translation (AVT) has been described by scholars as a part of Translation Studies that focuses on barrier-free communication (Chaume, 2013, 2018; Díaz-Cintas, 2020; Díaz-Cintas & Remael, 2007; Gambier, 2003; Neves, 2004, 2009; Pérez-González, 2014).

AVT emerged to overcome language hindrances in communication. Further, it has incorporated translation practices that aim to facilitate access to content for persons with impairments and, thus, accessibility (Bartoll, 2006; 2018; Díaz-Cintas, 2020; Díaz-Cintas & Remael, 2007; Gambier, 2003; Jankowska, 2020; Neves, 2004; Romero-Fresco, 2013, 2019). Audiovisual content is complex in nature, as is the process of making it accessible for viewers with needs that can range from language to cognitive, or sensory.

Gambier (2003, 2013) describes the task of making AV content accessible as multi-layered. On the one hand, verbal and non-verbal elements must be made perceptible (legibility) through the auditory or visual channel. On the other, communication is to be facilitated without causing cognitive overload (readability) and within spatial and time constraints. AV professionals often resort to an economical use of the language to meet these constraints (Asociación Española de Normalización [AENOR], 2012; Arnáiz-Uzquiza, 2012; Bartoll, 2004; Díaz-Cintas, 2010, 2013; Fryer, 2016, Matamala, 2006; Neves, 2009). This underlines how linguistic simplification is not an unknown task in AVT.

3.1 Cognitive text simplification

Text simplification tasks aim to reduce the complexity of texts while avoiding loss of content (Carroll *et al.*, 1998; Coster & Kauchak, 2011; Chandrasekar, Doran, & Srinivas, 1996). In the 90s, research on textual simplification started with a focus on (machine) syntactic simplification in the field of computer linguistics. Later, text simplification attracted the attention of scholars, who studied its effectiveness for users with specific needs. This method, also known as cognitive text simplification, draws upon cognitive approaches of reading comprehension. As defined by Arfé, Mason, and Fajardo (2017, p. 2191), “the aim [...] is not simply to reduce the linguistic complexity of the text, but to improve text coherence and the structure of information in the text.”

Many groups have been targeted by research focusing on cognitive text simplification. For example, those with intellectual disabilities (Fajardo *et al.*, 2014; Feng *et al.*, 2009; Saggion, 2017), and readers with dyslexia, aphasia or deafness (Bachmann, 2013; Saggion, 2017). Furthermore, adults with low literacy levels (Aluísio *et al.*, 2010), language learners (Urano, 2000), and non-mother tongue speakers (Cornelius, 2010) have also been targeted.

Academic research in the field of cognitive text simplification studies those features that make a text difficult or easy to understand. Scholars agree that the degree to which a reader understands a text depends on two elements: readability and understandability (Siddharthan, 2014; Wissing, Blignaut, & van den Berg, 2016; Wray & Janan, 2013). Readability of a text essentially means the levels of difficulty or ease that are measured using text-dependent variables. For example, sentence and word length, syntactic structure, or familiarity of words (Arfé, Mason, & Fajardo, 2017). Conversely, understandability is contingent on a person’s skills and abilities to make meaning out of a text in a specific context (Siddharthan, 2014; Saggion, 2017; Wray & Janan, 2013).

At this stage, the difference between understandability and comprehensibility should be outlined. While the former relates to the ability of a person to make meaning of a message, comprehensibility refers to the cognitive load caused. In other words, comprehensibility deals with the amount of effort that a person has to put into understanding something (Levis, 2018).

Nisbeth Jensen (2015) underlines the lack of consistency in the use of the term comprehensibility in AVT and provides some synonym terms found in the literature. For example, readability, complexity, or even accessibility. In this PhD, understandability is used to refer to a person's abilities and skills to deduce meaning from a text, while readability is understood as the level of difficulty or easiness of a text that can be determined by text-dependent factors.

Readability as a characteristic that is text-dependent is affected by linguistic and legibility parameters (Burt, 1949; European Commission, 2009; Ma & Rau, 2011; Siddharthan, 2014; Saggion, 2017). While legibility parameters deal with features that affect perception (Bachmann, 2013, Perego, 2008; Tinker, 1963), linguistic parameters are textual ones. Scholars have categorised these as: lexical, syntactical, style, and discursive (Bredel & Maaß, 2016; Fajardo *et al.*, 2014; Saggion, 2017; Vajjala & Meurers, 2014).

The perceptual level of readability concerns the process of decoding information during the first interaction between a reader and a text. The understanding of perception as a readability factor rests on the assumption that readers access content through the medium in which it is transported. In written texts, perception is influenced by parameters that range from typographical to paratextual. Some examples are font-size, font-type, contrast, and ratio text-to-white space (European Commission, 2009; Inclusion Europe, 2009; Kouroupetroglou, 2015; Marks, 2009; Nietzio, Naber, & Bühler, 2014; Yuste Frías, 2012; Tinker, 1963). Similarly, in oral texts, perception is influenced by prosodic parameters, such as pitch, intonation, stress, or sound quality (Fryer, 2016; Rodríguez, 2017; Starr & Braun, 2020, Van der Heidjen, 2007; Walczak & Fryer, 2017).

Readability is also influenced by linguistic parameters. The literature reviewed classifies them into different categories: lexical/syntactical, stylistical and discursive. Syntactical and lexical parameters that make a text more or less readable are connected to features that include the number of syllables, sentence length, the semantic familiarity of words, type of grammatical constructions, or order (European Commission, 2009, Hockett, 1961; PLAIN, 2011; Saggion, 2017).

Style choices that are made to convey meaning also affect readability. The reviewed sources concerning text simplification show that, for instance, the use of active verb constructions is preferred over passive ones. Similarly, abbreviations, acronyms, and technical terms should be avoided, and correct spelling and punctuation used. Other recommendations include the use of one adjective per noun, and to follow the canonical subject-verb-object (SVO) structure (European Commission, 2009; Hockett, 1961; IFLA, 2010; Inclusion Europe, 2009; PLAIN, 2011; Saggion, 2017).

The discursive level concerns text coherence, cohesion, and structure. Cognitive text simplification at this level aims to avoid semantic gaps that may hinder comprehension, lead to misinterpretations, or even alter the original meaning (Arfé, Mason, & Fajardo, 2017; Neves, 2009; Saggion, 2017; Siddharthan, 2003, 2004; Zhong, Jiang, Xu, & Li, 2019). This view draws upon the idea that less is not always more. Put differently, it outlines the idea that removing linguistic complexity at lexical or grammatical levels alone does not necessarily help (inferential) comprehension, as shown in young less-able readers (Di Mascio, Gennari, & Vittorini, 2011) and second-language learners (Urano, 2000). Lastly, the discursive level also deals with pragmatic meaning. As an example, Saggion (2017) explains that a simplified text should preserve the text-type of the original so that, for instance, a simplified children's book or a piece of news can still be recognised as such.

To conclude, cognitive text simplification considers readability and legibility as factors that influence content accessibility. The opposition between readability as text-dependent and understandability as contingent on the reader lends to the conclusion that texts must be legible to be readable. Yet, not all readable texts may be understood (Rodríguez Diéguez, 1994; Shardlow, 2014).

The reviewed sources point out that text simplification tasks aim at supporting coherence and, thus, go beyond a simple linguistic reduction. The next section explores how text simplification and the notions of legibility, readability, and understandability are approached in audiovisual translation.

3.2 Text simplification and audiovisual translation

This idea of text simplification as a means to convey the essence of a message, and of readability as an enabler of understandability, is also found in audiovisual translation (Díaz-Cintas & Remael, 2007; Georgakopoulou, 2009; Di Giovanni & Gambier, 2018). The need for simplification in AVT derives from three main characteristics that define the audiovisual medium. On the one hand, the use of two channels to convey content (audio and video). On the other, the presence of two restricting factors: time and space.

Text simplification helps translators to make quantitative choices about what is padding or necessary, and qualitative choices about how to best render the message in time and in a limited space (AENOR, 2012; Arnáiz-Uzquiza, 2012; Díaz-Cintas & Remael, 2007; Mayoral, 1997; Ramos Pinto, 2006). For example, a subtitler has a limited time (1 to 6-8 seconds) to fit a translation in a constrained space (1-2 lines of appr. 35-40 characters each) to enable synchrony of the subtitle with the image. To this end, AV translators use well-established tasks, including “reduction”, “simplification of syntax” and “expansion” (Gambier 2006 in Eugeni, 2012, p. 1280).

Reduction is the most common of these so-called condensation strategies and can be triggered by “textual” or “formal” factors, or both (Bogucki, 2004; Díaz-Cintas, 2013; Díaz-Cintas & Remael, 2007; Gambier, 2004; Gottlieb, 1992, p. 164; Remael, 2004). As an example, a subtitler may omit repetitions to meet a specific number of characters per line (textual). Yet, the same subtitler may delete redundant information to leave the obvious subtitled (formal), if it does not affect cohesion or understanding.

As seen before, less might not always be more in AV translation. De Linde and Kay (1999) warn about the outcome of audiovisual translations that use reduction to improve readability in terms of word recognition and reading speed. They identified that a higher lexical density in the subtitles (Halliday, 1989) and a possible loss in lexical cohesion might affect understandability. Furthermore, leaving out words can change the meaning of the message conveyed. Moreover, a lack of cohesive elements will force the audience to infer the meaning themselves and, thus, increase the cognitive load (Neves, 2009).

Reception studies in AVT have helped to understand audiences and their needs, and to describe translation phenomena as objectively as possible (Chaume, 2018; Saldanha & O'Brien, 2014). The literature reviewed shows that empirical research and reception models in the field also focus on legibility and readability, and are participant-oriented (Gambier, 2003; Saldanha & O'Brien, 2014). To do this, so-called reception studies draw on a causal model that aligns with Gambier's description of AV translations as multi-layered. The 3 Rs model, as it is termed, deals with different types of reception level: "Response" (legibility), "Reaction" ("readability") and "Repercussions" (user experience) of translations (Chesterman, 2007; Gambier, 2006, 2013, p. 57, Kovačič, 1995).

A closer look at the model reveals that the concepts are very similar to those already studied in text simplification outside the realm of AVT. Response concerns viewers perceptual decoding and revolves around their ability to scan words to recognise them (Frederiksen, 1978; Gambier, 2003; Nietzio, Naber, & Bühler, 2014). This dimension considers paratextual features and design (Neves, 2009; Yuste Frías, 2012). In subtitling, for instance, these parameters that are referred to as "technical" or "aesthetical" in the literature include, for instance, font-type, font-size, contrast, placement, alignment, and punctuation (Bartoll, 2008, p. 260 for technical; Arnáiz-Uzquiza, 2012, p. 107 for aesthetical).

For its part, reaction concerns those psycho-cognitive aspects related to the necessary effort to process linguistic information. Gambier (2003; 2018, p. 57) refers to it as "readability" or the ability of a translation product, such as subtitles, to facilitate communication without causing cognitive overload. In other words, to what extent the meaning conveyed is understood, and to what degree of effort processing demands from viewers. In the case of subtitles, some elements contained in this level are: text complexity, semantic load, or speech rates, semantic coherence, or lexical density (Gambier, 2003, 2009).

Lastly, repercussion is a notion concerning personal and social attitudes, values, and preferences towards audiovisual products (Gambier, 2013, 2018). While response and reaction can be categorised as "individual" dimensions of reception, "repercussion" also has a social dimension (Orrego Carmona, 2018, p. 377).

The literature reviewed has revealed a shared approach and notions between text simplification practices outside and within AVT. However, a lack of reception studies in AVT that involve persons with reading and learning difficulties compared to those with sensory impairments was also identified. This limited number of scholarly work underlines that there are still persons who cannot participate in this part of life and are at risk of exclusion. The lack of research in the field was bridged in this thesis by adopting an applied approach (Williams & Chesterman, 2002). In this case, it draws upon academic knowledge from AVT and cognitive text simplification, as well as from E2R experience-based guidelines.

The literature review shows scarce, initial contributions concerning the use of Easy-to-Read in audiovisual content. For instance, the case study carried out by Alba Rodríguez (2014) explored how subtitles can be adapted for persons with cognitive disabilities. Alba Rodríguez worked with an end-user to identify what cues are needed when, and what type of information supports the viewer's understandability.

Similarly, the project Teatro Accesible¹¹ (Accessible Theater) investigated the integration of a line of E2R audio description into AD assistive devices for people with cognitive disabilities. One final example is the research carried out by Starr and Braun (2019) concerning emotive AD target texts for autistic children. In Germany, scholars already working on Easy-to-Read such as Silvia Hansen-Schirra or Christiane Maaß are starting to research in the field of audiovisual translation.

This PhD thesis follows a similar applied approach and borrows existing knowledge to focus on how access services that use Easy-to-Read can be developed. The applied perspective adopted does not assume that current methods and practice are flawless. Nikolić (2018) raises awareness about this pitfall in the case of eye-tracking. On the one hand, the scholar acknowledges the developments that eye-tracking technology has enabled, such as Arnáiz Uzquiza's (2012) evidence-based framework of parameters to study subtitles for the Deaf and Hard-of-Hearing. On the other, Nikolić (2018) also points at the limitations of the method, such as the challenge of designing representative samples in eye-tracking studies.

The table provides an overview of the notions borrowed in this PhD.

¹¹ Accesibilidad cognitiva en las artes escénicas. Experiencia piloto en el marco del proyecto Teatro Accesible. (*Cognitive accessibility in the scenic arts. A pilot experience within the project Accessible Theatre*) (<http://www.cesya.es/amadis2016/programa>). Congreso Amadis 2016, Toledo (Spain).

Table 1. Chapter 1. Definitions of the main concepts as understood in this thesis

Concept	Definition
Easy-to-Read	<p>Easy-to-Read (E2R) is a text simplification, guideline-based method that has shown to enable access to written content for this heterogeneous group of persons with reading and learning difficulties. (Inclusion Europe, 2009; IFLA, 2010; Saggion, 2017; Plena Inclusión Madrid, 2018).</p> <p>The European Federation of Libraries Associations defines Easy-to-Read as following (IFLA, 2010, p. 6):</p> <p>"easy-to-read" [...] means a linguistic adaptation of a text that makes both reading and comprehension easier. The aim of easy-to-read publications is to present clear and easily understood texts appropriate for different age groups. To achieve such a product, the writer/publisher must take into consideration content, language, illustrations, as well as graphic layout.</p>
Legibility	The perceptual level of readability. It concerns the process of decoding information during the first interaction between a reader and a text (Tinker, 1963; Bachmann, 2013).
Readability	Readability of a text expresses levels of difficulty or easiness that are measured using text-dependent variables. For example, length of sentence and words, syntactic structure, or familiarity of words (Arfé, Mason, & Fajardo, 2017).
Text simplification	The aim of text simplification is not simply to reduce the linguistic complexity of the text, but to improve text coherence and the structure of information (Arfé, Mason, & Fajardo (2017, p. 2191).
Understandability	A person's skills and abilities to make meaning out of a text in a specific context (Siddharthan, 2014; Saggion, 2017; Wray & Janan, 2013).

The understanding of these concepts, as defined in the table, outlines the focus on cognitive text simplification followed in this thesis, which goes beyond linguistic reduction. That is to say, when simplifying a text, 'less is [not always] more'. To the contrary, simplification is also considered to include elaborations and the addition of information to make information more explicit, where necessary.

Furthermore, text simplification is understood as encompassing two different yet interrelated aspects: readability and understandability. On the one hand, readability is a text-dependent factor that can be studied to facilitate easier access to audiovisual content for all. On the other, understandability is a user-dependent factor that is necessary to determine the readability of texts for users of E2R content.

The following section explains the methodology chosen in this PhD to meet the objectives by considering the type of hypothesis and the resources available to the author.

4 Methodology

Research in Translation Studies is conducted in the discipline's two branches: the Pure branch and the Applied branch (Toury, 1995, 2012). Each effort contributes to the development of the field, the profession and an area of research. For instance, audiovisual translation (Chaume, 2002).

In 1972, Holmes described the Pure branch in Translation Studies, as opposed to the Applied branch. Generally speaking, the difference lies in "pureness" on how translation is approached. While the Pure branch deals with translation's knowledge as the means and end of its theoretical and empirical efforts, the Applied branch focuses on translation's use (Toury, 1995, 2012).

By doing so, translation knowledge is used in the Applied branch. For instance, for training purposes. As an example, training of prospective subtitlers would encompass knowledge about audiovisual translation and also knowledge about didactics. Similarly, a theoretical model could be used to assess the quality of a translation. One last case would be the production of a WCAG-compliant video that includes audio content. In these examples, translation knowledge is used together with knowledge in a field of application (i.e., training, quality assessment, digital accessibility) to serve a practical purpose.

The PhD's research can be located in the Applied branch: it focuses on the use of E2R translations to create accessible media products. By doing so, it also considers the digital accessibility of easy access services as a whole. That is to say that the translation should be Easy-to-Read and access, and its operation must be accessible for persons with reading and learning difficulties.

Methodologically, this thesis resorts to applied research to solve the practical problem of how to make AV content accessible for persons with reading and learning difficulties. By doing so, it borrows concepts and outputs from scholars and professionals from the field (i.e., audiovisual translation, text simplification, Easy-to-Read guidelines) (Chaume, 2002; Saldanha & O'Brien, 2014; Williams & Chesterman, 2002).

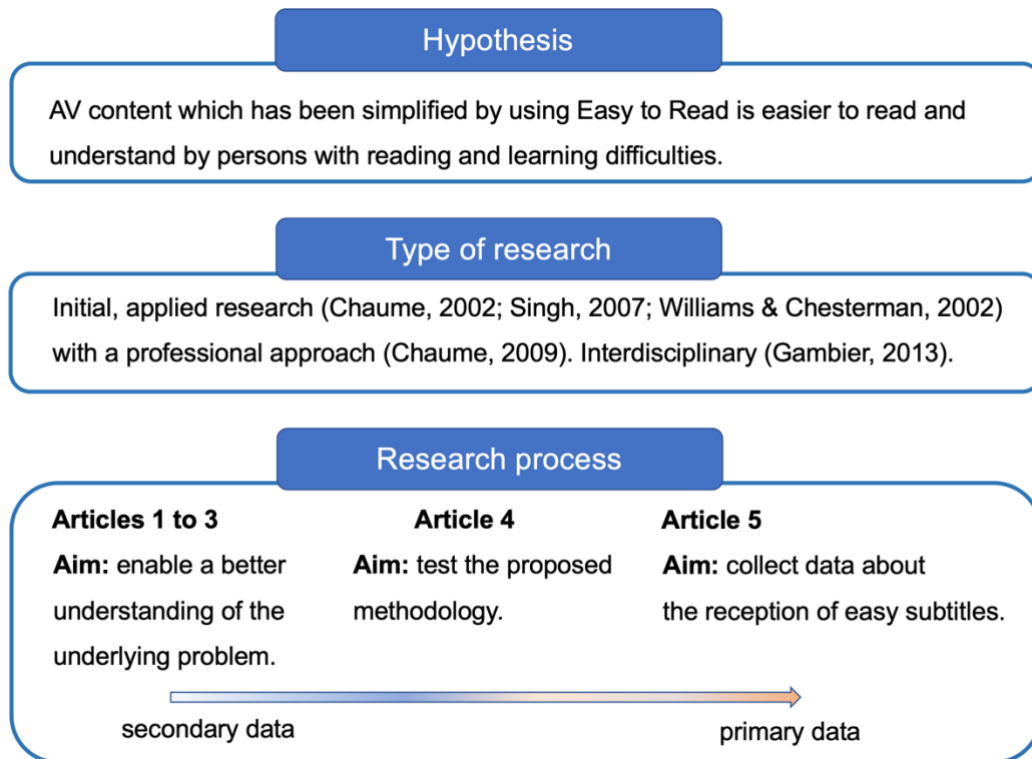
Chaume (2009, p. 290) describes research practices that include experience-based sources as “professional approaches” which use knowledge from the job. According to him (Chaume, 2009, p. 290), such research may not agree with existing research conventions, but it has “helped researchers to develop their particular theories of AVT”. The use of experience-based E2R guidelines in this PhD emerged from the lack of empirical work and scant scholarly attention that the topic received in 2017, which is also when this thesis started.

The novelty of the topic also allows us to categorise this research as exploratory “initial research”, “[...] which forms the basis of more conclusive research” (Singh, 2007, p. 64). As such, the research conducted in this PhD draws upon existing literature to achieve a better understanding of how E2R can be used within AVT. Saldanha and O’Brien (2014) have described this type of research practice within AVT. Indeed, they see it as a type of research that brings together information about an area that has not been researched before. Methodologically, Saldanha and O’Brien (2014) provide an example, in the case of secondary-data based research, which they describe as a research that is similar to literature review, but with a different aim. Though this type of research seems to be acknowledged among scholars, its less conclusive nature remains a shortcoming that could be addressed through empirical research such as reception studies (Di Giovanni, 2016; Di Giovanni & Gambier, 2018; Díaz-Cintas & Remael, 2007).

To summarise, the described limitations have shaped the methodology used in this PhD. These constraints are a lack of access services that use Easy-to-Read to provide access to audiovisual content and a lack of academic information available. The illustration below shows that the methodological approach follows current practice and recommendations from scholars in the field.

The figure below provides an overview of the methodology that has been used to conduct secondary data-based research in the first three articles and two case studies in the last two. The latter involved the participation of end-users of Easy-to-Read content.

Figure 1. Chapter 1. Hypothesis, research approach and type of conclusions.



Articles 1 to 3 drew their conclusions from written secondary data. The literature sources used were selected according to the three “qualifiers” that also apply to literature review: systematic, explicit and reproducible (Saldanha & O’Brien, 2014, p. 19). The first concerns the organisation behind the selection and processing of sources, which should be thorough, consistent, and coherent throughout the research. The second implies that the relevance of the sources, selected or rejected, are clearly defined and justified. To this end, the sources in this thesis concern mainly AV translation and text simplification.

The types of sources were both academic and non-academics in order to fulfil the ascribed professional approach. In the case of exclusion of a source, this was justified. For instance, literature about easification devices has been excluded, because the method is not considered suitable for AV translations. The main reason for this is that the use of these devices requires continuous pausing of the audiovisual product during viewing. Lastly, the final qualifier, reproducible, can be described as the ability of a source to be found and used by other scholars.

The extent to which these criteria were met in the articles was ensured by the peer-reviewed conditions. The conclusions withdrawn from the secondary sources studied in Article 1 to 3 supported the definition of Easy-to-Read as an access service and to locate it within AVT. The conclusions withdrawn from the secondary sources studied in Article 1 to 3 supported the definition of Easy-to-Read as an access service and located it within AVT.

Article 4 and 5 can be described methodologically as case studies with a focus on a single unit of investigation (Saldanha & O'Brien, 2014; Williams & Chesterman, 2002). Both are explorative. The 'case' studied in Article 4 delivered a series of parameters for creating E2R subtitles, while the 'case' studied in Article 5 was the reception by persons with intellectual disabilities of E2R subtitles, which were created with the parameters from Article 4. The approach followed in this last article draws upon the 3Rs models on reception described in the theoretical framework section of this thesis.

The suitability of case studies for this PhD rests on the flexibility and characteristics ascribed to them in the literature (Saldanha & O'Brien, 2014). For instance, the ability to study a particular case and to consider a wider type of data allowed in Article 4 to identify subtitling parameters using two guidelines from the practice. Saldanha and O'Brien (2014) also warn that this flexibility may mistakenly lead to the assumption that case studies are less scientific or reliable. As they explain, case studies are a common research method in translation, with clearly defined requirements, and boundaries.

Nonetheless, case studies have drawbacks. The main limitation is that results from case studies are not generalisable (Saldanha & O'Brien, 2014). Gillham (2003 in Saldanha & O'Brien, 2014, p. 210) argues that results from case studies may not be generalisable, but the obtained "evidence may be transferable" and help solve "a similar case". In these terms, the procedure followed in Article 4 to identify subtitling parameters could be transferred to other scenarios, for instance, the identification of parameters for audio descriptions. Similarly, the validation process used in Article 5 to test E2R subtitles in opera could also be used to validate E2R subtitles, such as those for pre-recorded TV shows.

To sum up, the research conducted in this PhD is considered to be applied and initial. The methods used draw on research practices in the AVT field. Although some conclusions or outputs may be less conclusive or generalisable, it does not limit their transferability and contribution to the field.

The next sections present each article by order of creation.

Chapter 2. Article 1. Easy to Read as Multimode Accessibility Service

Summary

The article includes five sections. The first introduces the topic by reviewing terminological issues concerning the following terms: modes, modalities, and services within the field of Audiovisual Translation (AVT). The second expands on the concept of access service, explains two main areas: content creation and management, and provides a list of current access services. The third section is devoted to Easy to Read, which is approached from different perspectives, i.e., as language variety and a method. Finally, the fourth section includes examples of prospective access services that can result from adding a layer Easy to Read to existing ones. The last section summarises the main conclusions.

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Easy to Read as Multimode Accessibility Service

Abstract

Media accessibility is becoming mainstream. While it cannot compete for popularity with the two original fields –architecture and design accessibility– it is slowly gaining acknowledgment. Subtitling was and still is the most popular media access service. In recent years, more services have been joining the alternative possibilities to access information. New technologies have also increased the number of services, and Easy to Read is proposed in this article as a new candidate to join the list of services. This article will start by describing Easy to Read, and understand its approach as: a translation modality, a linguistic variation or as a service. The second part of the article presents many accessibility services and Easy to Read features. In the third part, new hybrid services are proposed. These are the result of adding to existing access services a layer of Easy to Read creating a higher degree of accessibility. Any accessibility service aiming to facilitate comprehension will improve and optimize its function by leaning on Easy to Read. The article finishes offering many examples to secure a rapid uptake of the service across the different accessibility fields, from design to web accessibility or transport.

Keywords: Easy to read, media accessibility; media accessibility services, media accessibility modalities, subtitling, audio description, Sign Language interpreting.

1 Accessibility: modes, modalities, and services

As with any academic field, the first task should be to define, agree and fix the terminology. This has not been achieved in the adjacent field of Audiovisual Translation (AVT). For example, there is no agreement in English for the term which implies a transfer of spoken words into written text, as a translation or transcription: subtitle or caption. As with any term outside the realm of sciences, the phenomenon is more complex, hence defying definition and taxonomy. In the case of subtitles, we find for example that in the UK the English into English transcription is called subtitle. This in most EU countries will be considered a poor subtitle for the deaf and hard of hearing (SDH), since same language transcription was originally created for the deaf and hard of hearing community. Much water has gone under the bridge since that medical and exclusive approach to media accessibility. Nowadays Media Accessibility is an issue of political will and of moral obligation, now enshrined in the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) Article 9. Working within the Universal Design concept we move from Disability Studies to Usability and when that fails Accessibility. The aim is designing products and services usable to the greatest extent possible by everyone, regardless of their age, ability, or status in life. What is considered in AVT as SDH, is hardly consumed by the intended end user. SDH, usually with little if any sound annotations, are enjoyed by the large majority of the population watching a screen in either a noisy surrounding as a bar or an airport, or where a screen/s is shared by many people as in trains, or buses. It could be argued that caption / subtitle is a caveat, but when we find other services such as audio description or video description as synonyms, or spoken caption or audio subtitles, it becomes evident that in AVT, even in standardization agencies such as ITU or ISO, terminology is a long-standing issue. It is also interesting to observe the lack of universal iconography for these services.

While there is terminological and iconographical indetermination in AVT, perhaps for Media Accessibility we can try to understand some basic concepts: what are modes, modalities and services. This very first classification is needed in order to study Easy to Read (E2R), and all other forms of alternative communication to facilitate access to audiovisual content. In AVT subtitling, dubbing and voice-over are the three main modalities or transfer modes (Gambier and Gottlieb, 2001). To confuse more the terminology, we find Gambier (2008) who refers to “modality” as the text type translated in AVT, moving from monomodal which would be the written form into an audio and visual multimodal text. Taylor (2003 and 2004) applies the term multimodal beyond text type embracing subtitling but as late as 2015 Pérego and Bruti open up the definition for subtitling as a “form.”

Taking advantage of the two existing handbooks of translation studies, published by the prestigious John Benjamins and Oxford University Press, we find Schwarz (2011: 402) who mentions dubbing as a “technique” and three pages later (*ibid*: 406) changes it into “method.” Remael (2010), Díaz-Cintas (2010) and Díaz-Cintas and Orero (2010) agree on “mode” to define subtitling and revoicing, depending on whether the translated or transcribed text is inserted as a written text or as a new soundtrack. Given the relevance of the latter authors in the AVT literature, we shall agree here that in the field of AVT “mode” defines these two macro-modes of audiovisual content. Can “mode” be borrowed by Media Accessibility terminology to group the services currently used in Media Accessibility (MA) like subtitling, audio description, Sign Language interpreting, etc.?

The term “service” has been used since the focus of MA is to offer an alternative mode of communication to users. So, in this sense, they are services, though if the object of study is related to the communication channels then “modality” will be the term. In the report of the International Federation of Library Association and Institutions (IFLA) entitled “Guidelines for easy-to-read materials” the term Easy to Read (E2R) has two definitions: “One means a linguistic adaptation of a text that makes it easier to read than the average text but which does not make it easier to comprehend; the other definition means an adaptation that makes both reading and comprehension easier” (IFLA, 2010: 3). Following this E2R can be described for Media Accessibility as a service to improve reading and foster comprehension.

2 Accessibility services

Alternative ways to provide access to audio visual content are the objective of these services which go from audio description to translation. All the services offer many possibilities when being created and delivered, as the technical requirements for each situation. The two sides of media accessibility –technology and content– are indispensable for any service to exist. We may have all the technological infrastructure to deliver subtitles, still we need the actual subtitles files to offer the service. For this reason, the two areas are described below.

2.1 Content Creation

Content to some accessibility services is almost always created by a professional, e.g., the subtitler between languages. Other services are created automatically, e.g., audio subtitles. A reality is that sooner or later all services will have the possibility of being created in an automated way –with a direct implication to its quality. Right now, it is possible to generate automatic subtitles, as for example those in YouTube. Audio subtitles are almost always fully

automated, with no post edition. And services such as audio introduction or Easy to Read may take longer to automate, but at the rate technology is developing it should not be long. Automation fits well with the responsibility adopted by countries when signing the CRPD. If media accessibility moves to become an obligation, services need to be mainstreamed, as any other industrial service (Orero and Tor-Carroggio, 2018).

Content creation also varies when it has to be created in real time. In that case, different production solutions are available, again from automatic to manual or semi-automatic or semi-manual. Services can also be offered live by relay, when the person who produces the content is physically in a different location. Finally, content can also be produced by crowdsourcing either for commercial or volunteer interests.

Content creation depends on the situation (live or recorded), the working practice (amateur, voluntary, crowdsourcing, professional, relay, delocalised, in-house, freelance, etc.), and the technology used for its creation (automated, semi-automated, manual).

2.2 Content Management

Once the content is created, either by a machine, a person, or in a shared economy fashion, it needs to be tagged and stored. Each accessibility service has its own digital formats. Some are text files (subtitle), others are text files that can be converted to speech (audio subtitle or audio description), some are spoken (audio description), and some are visual (Sign Language). Also to be taken into consideration is the technical requirements for each service outlet. These days almost all accessibility services can be consumed by multiscreen devices. And finally, these services have to be also packed (coded) for its transport and decoded at the other end, and synchronized.

In management, there is also the interaction between the person / company who creates the accessibility service content and the client. To upload the content, for example, to a ftp server, to be downloaded by the subtitler. Then the subtitler will create a subtitle file which in turn will also be uploaded again to the ftp server for further coding before being stored and distributed.

2.3 Some Accessibility Services

The objective of this article is to add Easy to Read to the list of existing accessibility services. In order to understand the inclusion of E2R to the existing list of accessibility services, and the resulting hybrid modality with E2R, is important to understand the creation and

management of access services. From previously funded research projects, we have gathered some audiovisual assets describing the services and proposing guidelines. They can be consulted on the project URLs: ACT,¹² ADLAB PRO¹³ and HBB4ALL.

- Audio description / video description, according to the EU funded project ADLAB PRO is “the insertion of short verbal descriptions illustrating the essential visual elements of an audiovisual product.” AD is offered with different types of arts and media content, and, accordingly, has to fulfil different requirements (Maszerowska, Matamala and Orero, 2014). Descriptions of “static” visual art, such as paintings and sculptures, are used to make a museum or exhibition accessible to the blind and visually impaired. These descriptions can be offered live, as part of a guided tour for instance, or made available as downloadable files on a museum’s websites, as part of an audio guide. AD of “dynamic” arts and media services has slightly different requirements. The descriptions of essential visual elements of films, TV series, opera, theatre, musical and dance performances or sports events, have to be inserted into the “natural pauses” in the original soundtrack of the production. AD for dynamic products can be recorded and added to the original soundtrack (as is usually the case for film and TV), or it can be performed live (as is the case for live stage performances).
- Subtitles / captions / subtitles for the deaf and hard of hearing (SDH). These three terms are used indistinctively but are in fact quite different (Matamala and Orero, 2009). First of all given the proliferation of screens, subtitles / captions / SDH may be shown in TV, cinemas, PC screens, secondary screens such as tablets or mobile phones (entitles), but they can also be placed on the top of proscenium in an opera (surtitles). Subtitles, also called interlingual subtitling, are usually translations. Though some broadcasters such as the BBC call subtitles the more or less adapted transcription from dialogue to text, no translation is involved. SDH, or intralingual subtitles, adds information about background sounds and who is speaking along with a transcription of the script. Many combinations are possible within the terms, since it is possible to find interlingual SDH. There is a short document with video examples to be found here
- Sign Language interpreting translates oral speech into signed speech. Sign Language (SL) is a natural language. In some countries like Spain it is considered an official language. In fact, there are two signed official languages in Spain: Catalan Sign Language and Spanish Sign Language.

¹² In <http://pagines.uab.cat/act/> (consulted 13/06/2017).

¹³ In <https://adlabpro.wordpress.com> (consulted 12/06/2017).

- Audio subtitling / captions / SDH render captions/subtitles/SDH into speech by human or synthetic speech.
- Audio introduction is a continuous piece of prose, providing factual and visual information about an audiovisual product, such as a film or theatre performance, that serves as a framework for blind and visually impaired patrons to (better) understand and appreciate particular audiovisual material. It can be created to enhance the AD of that material, or it can be made to stand alone. The AI can be recorded and made available well before the viewing of the material (via a website, etc.) or it can be delivered live, as is often the case in the theatre. The introduction can be spoken by a single voice or it can be a combination of voices and sound bites.
- Braille transcription transforms written into tactile text.
- Touch tour, is a service provided before a stage performance. It may offer a guided tour of the space, some props, and costumes.
- Hearing Loop / induction loop is a service enhancing sound reception for persons with assistive listening aids.
- Vibrating chairs create a vibration sensation that matches the intensity of the film sound effects.
- Clean Audio offers dialogue enhancement by reducing background noise.
- Accessible materials, are any complementary information for a venue, such as accessible routes, accessible payment methods, accessible programmes, etc.
- Web accessibility, the internet is an essential way to access and provide information and services. Web accessibility allows everyone, including people with disabilities, to perceive, understand, navigate, and interact with the Internet and its contents. The same vision of accessibility should apply to mobile apps, considering the developments in technology and trends in the last years. This is the most developed accessible service regarding accessibility with the W3 organization.¹⁴.

3 Easy to Read

The increased production of Easy to Read (E2R) texts has derived from the new legal framework, but also from social needs and has attracted the attention of both professionals and scholars. In some countries such as Sweden, Spain or Italy, the development of E2R has also been triggered by the growing displaced population who needs to fulfil some official requisites and fill in documents. The Spanish Ministry of Social Affairs (CEPAT, 2015) has

¹⁴ In <https://www.w3.org/WAI/intro/accessibility.php> (consulted 14/06/2017).

issued a document with the main traits of E2R. It is interesting to read the many institutions which took part drafting this document: from persons with disability organizations, to a university, and the police. This goes to show the interest from the different constituencies in developing a way to allow all type of personal profiles to access written content in a more efficient fashion.

While E2R is not yet established as an access service, or an academic course, its production and training is fractionated, having gained the interests of: linguists, socio-linguists, translators, persons with disability associations, social workers, and even typeface designers. There are also official E2R associations in most countries acting as a consultancy. The growing demand for this service, along the training and academic gap, has triggered different schools and approaches. E2R is growing beyond a set of writing and digital accessibility guidelines.

3.1 Easy to Read as Accessibility Service

Access to information through written and electronic communications, is determinant for personal development and fully participation in society as the UN Convention on the Rights of Persons with Disabilities declares. Any sort of barrier that restricts participation, limits opportunities or constraints autonomy, empowerment and self-determination is to be avoided. (United Nations, 2008)

Following the medical approach (Berghs *et al.*, 2016) to justify accessibility, we find nowadays that in high-income countries, comprehension barriers affect 1% of the population having an intellectual disability and up to 3% in those with lower-income (Special Olympics, 2016). In figures, this means as many as 200 million people. Statistics rise when we move from the medical approach to mainstream “for all” approach (Orero and Tor-Carroggio, 2018) and add other profiles, for instance: elderly, immigrants, tourists, people with learning issues, and those with low literacy. Despite the wide range of profiles affected, cognitive accessibility is still less developed (FEAPS Madrid, 2014), highly stigmatized, and shows a high complexity which requires multidisciplinary approaches (Scior *et al.*, 2015). The same can be said for those who in 2017 are still illiterate, or have low reading and learning skills.

Either way, disability is nowadays understood as a state resulting from “the interaction between a person’s health condition(s) and that individual’s contextual factors (environmental and personal factors)” (WHO, 2001, 8,10). Within Universal Design paradigm, it is impossible to have a universal accessible context or society. It is possible though, taking a closer look at the context itself and its demands when it comes to performing tasks. Modifying or easing the

context characteristics according to the needs of the audience has become a main issue. In the field of cognitive disability, the concept of so called “supports” already exist (Verdugo and Schalock, 2010). Depending on their nature, supports can be services, products, technology, organizational processes, etc. They seek to breach the gap and build bridges between a person’s skills and the environmental demands, focusing on the person’s skills, not on “one size fits all” approach. Amongst them, Ocampo (2015) mentions Easy to Read as one of the advances achieved in the area of cognitive accessibility. As a methodological approach to make messages accessible to all people, in their intellectual and learning diversity, E2R can hence be considered an accessibility service.

3.2 Linguistic Features of Easy to Read

From a linguistic point of view, E2R is nowadays widely considered a functional variety of a national language (Bredel and Maaß, 2016) showing a restricted functionality. As such, it shares linguistic and extra-linguistic aspects with the standard language, but differs from it when it comes to improving perceivability and comprehension of written texts for the intended target group: for all but especially for people with reading, learning or comprehension difficulties.

When a language is approached as a historical object with a communication function bound to the coordinates of a particular speech community (rather than as a self-contained system), its use varies along a set of dimensions, also known as the architecture of a language (Flydal, 1951). When looking at E2R following the set of four dimensions proposed in Coseriu 1981 it can be said that:

- As for its diastratic dimension, related to its social dimension, E2R focuses on the demands of a specific and heterogeneous social group: people with reading, learning or comprehension difficulties. However, E2R does not foster the creation of a closed social group with an own social identity, instead it seeks bridging communication barriers and fostering inclusion. Moreover, it serves to all people and social groups since comprehension processes are universal (Dalton and Proctor, 2017).

- As for its diaphasic dimension, related to the variation according to situations, E2R has been mainly used in the written medium where solid guidelines exist epigonic for each language. For perceivability and comprehension purposes, they reach out to a reduced form of the standard language but without falling into a-grammaticality. E2R combines different sign codes and uses strategies of the spoken language. Here again, the overall intention guides the use, taking place mainly through the written channel and with a carefully selected register to serve the communicative purposes of a given situational context. Although the envisaged planned process underlines that this variety has not arisen naturally from an active oral use within a community, its growth in planned spoken situations like broadcasting, audio introduction or audiovisual translation modes cannot be excluded.
- As for the diatopic dimension, that is the geographical area, E2R is not related to a local area or region. It is subordinated to the standard language when dealing with linguistic features, but to all languages when referring to its strategies. Recommending “simplification” can be applied across languages and writings, and paratextual features are also universal since they deal with cognitive processes.
- As for the diachronic dimension, related to its development over time, Easy to Read leans on the evolution of the standard variety following the same time axis. It is also true that since there are no standardized guidelines, E2R evolves according also to the level of awareness within each language.

Once E2R enters the field of accessibility services, strategies and scenarios, it will have to be studied and developed. From a translational perspective according to Jakobson (1959), “No linguistic specimen may be interpreted by the science of language without a translation of its signs into other signs of the same system or into signs of another system.” From this approach, E2R can be found in various types of translation dimensions:

- Intersemiotic, where a verbal sign system is transmuted into a nonverbal sign system
- Intrasemiotic, within the same sign system(s) (Gottlieb 2005: 39)
- Intralingual, where there is a transfer of verbal or nonverbal signs by the same or different channels within the same language
- Interlingual, where there is a transfer of verbal or nonverbal signs from one language into another by the same or different channels
- Intercultural and intracultural (Bredel and Maaß 2016: 183)

Authors and translators will therefore use a language variety in the transfer of meaning by subordinating all equivalence, semiotic and functional decisions to comprehension. In the case of AV Translation, although the modes are twofold, the constrictions are significant not only because of time, space or typographic matters, but also because the number of paratextual features are more finite than in other sort of digital texts.

3.3 Easy to Read Paratextual Features

Reading has many processes involved and can be studied from many angles and fields: communication, psychology, interaction, cognitive, sociology, physiology. Reading implies a text and its writing system from Cuneiform, Arabic, Japanese or Latin. There are many text types away from written, for example music, tattoos (Martin, 2013) or audiovisual. Besides the linguistics of each language, which has a direct impact in E2R, the visual appearance of each writing system is also important. In Europe for example three writing systems coexist: Latin, Greek and Cyrillic. When it comes to presenting a text, legibility or the ease with which letters can be differentiated is a basic feature. Much has been written on legibility from the sociological and psychological fields, and lately for screen reading and user interaction design. Legibility may determine the speed of reading and also its comprehension. Issues such as: colour, contrast, size and font are some of the components. Legibility has been one of the areas of research most developed in the field of Audiovisual Translation (Romero-Fresco, 2015) in an attempt to define subtitle quality. Many tests have been performed to define benchmarking for subtitles both from a psychological (Rayner, 1984, 1998; d'Ydewalle and De Bruycker, 2003, 2007) and audiovisual translation approaches (Kruger *et al.*, 2015).

Little normalization progress regarding legibility has been achieved in the realm of subtitling. This is surprising compared with the large volume of studies, and funded research. It is also interesting given the proliferation of standards, at national level such as Spanish UNE 135010 or the ISO / IEC DIS 20071-23. More surprising is the agreed WCAG 2.0 Guidelines, not only having clear instructions to all access services but also being forward since they already include E2R as one more service. W3 takes up this topic at A, AA and AAA levels seeking to lower the visual and cognitive stress experienced by readers. They demand perceivable information by means of adaptable (1.3) and distinguishable content (1.4), as well as readable and understandable content (3.1). Ultimately, always searching for the best interoperability across technologies (4). Nevertheless, the W3C (W3C, 2015) points out that the most useful checkpoints are either AAA or advisory techniques, and hence not implemented. According to the Consortium, level AA does not significantly help reduce the cognitive load and remits to other guidelines in the field of dyslexia. Their research has

shown that readers with dyslexia access text at a 25% slower rate on a computer and, amongst other things, recommend enabling readers to be able to set their own choices of font style and size.

Along this line, typefaces –as non-verbal paratextual features added during subtitling–, become information carriers, and reading facilitators. As to the latter, Inclusion Europe (2009) recommends, amongst other, to always use a font that is clear and easy to read and proposes sans-serif typefaces. The British Dyslexia Association (BDA) has undertaken some efforts to gather information on this specific issue. As for the available fonts, they list as free fonts Lexia Readable, Open-Dyslexic, Dyslexie; as purchasable fonts like Sassoon and Sylexiad; and as publisher-only fonts Barrington Stoke and Read Regular. Apart from the general agreement on using sans-serif fonts, the BDA underlines their lack of knowledge about research work on reading speed, accuracy or comprehension with different typefaces, as well as for screen or print presentation, apart from that of Sassoon and Barrington Stoke. (BDA, nd) As for the information collected by the BDA from users and designers it can be said that:

- For the letters, dyslexic readers prefer:
 - Good ascenders and descenders,
 - b, d, f, h, k, l, t, and all capitals; g, j, p, q, y.
 - b and d; p and q distinguished, not mirror images.
 - Different forms for capital I, lowercase l and digit 1.
 - Rounded g as in handwriting. Most liked rounded a, although perhaps some felt that it may be confused with o.
- Letter-spacing should facilitate scanning, so that e.g., r, n together rn should not look like m, (i.e., ‘modern’ may scan as, or sound like, ‘modem’)
- For files on screen, readers prefer to set their own preferences regarding style, size, colour and background colour.
- Other parameters including line length, line spacing and font size seem to be as important as the font.

Bachmann (2013) starts filling the research gap by the study undertaken to assess the benefits of using the reading font, EasyReading™, specially designed for people with dyslexia. The study showed that by changing the font, reading was found easier as well as simplifying by different reader groups. In the first phase of the study, the qualitative results obtained revealed that both groups –students with diagnosed Specific Learning Disorder

(SLD) and without SLD but certain learning difficulties– preferred the EasyReading™ texts over those presented in Times New Roman. In the second phase, the assessment of the reading performance (accuracy and fluency) of four different reader groups (normal readers, readers with dyslexia, reading difficulties or CPM₁₅ below 25th percentile) showed statistically relevant results in performance, in both fluency and accuracy, with EasyReading™ as opposed to Times New Roman.

3.4 Easy to Read Guidelines

As for the writing guidelines, the range is extensive reaching from the two most used ones, IFLA and Inclusion Europe, to national ones. In Germany alone, the following coexist

- the guidelines of Netzwerk Leichte Sprache – emerged from the practice and focused on quality assurance and the easy-to-read logo,
- those of the Easy to Read Research Centre of the University of Hildesheim – focused on E2R translators,
- those of capito – more language learning centred, and
- those annexed to the German Regulation for creating barrier-free information technology, known as BITV 2.1.¹⁶

Even though the focus is slightly different in each of them, a high degree of overlap has already been identified by known authors like Ursula Bredel and Christiane Maaß in Germany, Óscar García in Spain or Klaus Candussi and Walburga Fröhlich in Austria.

At a regulatory level, we find the current ISO standard work on comprehensive text and information, and the recommendations included on Web Content Accessibility Guidelines 2.0 (WCAG 2.0) of the World Wide Web Consortium (W3C) and the extensions and support material to WCAG 2.0 that are to come in 2018, as announced by the W3C Cognitive and Learning Disabilities Accessibility Task Force (COGA TF), which will complement the first draft published in 2015 under the title Cognitive Accessibility User Research¹⁷ in 2015 (Carreras, 2015).

¹⁵ Coloured progressive matrices.

¹⁶ BITV2.1: Verordnung zur Schaffung barrierefreier Informationstechnik nach dem Behindertengleichstellungsgesetz (Barrierefreie-Informationstechnik-Verordnung BITV 2.1).

¹⁷ For further information see: <https://www.w3.org/TR/coga-user-research/>

Finally, as are entrenched by use, the writers can move beyond them and focus on the needs of the audience and the evaluation of the outcome effectiveness regarding literal and inferential comprehension, and linguistic features (Fajardo *et al.*, 2014: 212), legibility, design, as well as the insertion of E2R in other fields, as pursued in this article.

4 Easy to read as a multiservice enabler

Easy to Read in itself is a service which provides access to content by focusing on cognitive accessibility. To this end, E2R facilitates understanding by using text simplification, illustrations, layout, and paratextual or prosodic features. As such, these strategies do not depend on an input source, channels or semiotic codes and, thus, can be used in current modalities.

The AVT landscape is a natural interdisciplinary and multidisciplinary habitat which mirrors and multiplies the AV translation macro-modes: subtitling and revoicing. Nowadays they merge to form a complex scenario of media formats and their distribution possibilities. The ever-changing world of technology is leading to new directions where people have an interaction with electronic devices hence changing context awareness, natural interfaces, immersiveness and ubiquitous availability of information in many and hybrid forms. In the many available platforms (television, DVD, web, mobile, cinema, opera, theatre) we find several translation modalities sharing and making available the information within. Traditional services such as dubbing, voice-over or subtitling are found next to newer media accessibility modalities such as audio description, Sign Language interpreting, and subtitling for the deaf and hard of hearing, which entail inter-semiotic transfer processes that go well beyond traditional linguistic or even cultural definitions (Matamala and Orero, 2013). It is within this context we find E2R and the endless possibilities to merge and heighten access to information through hybrid modalities.

Following the list of services presented in the previous section we shall describe how the services can be merged. The proposal is to generate the hybrid family of “easy” accessible services.

- Easy listening, easy to listen, or easy audio description. It is true that audio description is an oral modality. Still the process of creating an AD is usually to prepare a written script, and as with any written texts, this may be produced following E2R guidelines. Through applying E2R to audio description, or audio introduction, it will be easier to understand. Still given the fact that audio description has a complex production: written and spoken, it is also possible to have an Easy to Listen, or Easy Listening text. This concept has not been researched, and, in a way, it is complementary to Clean Audio. The latter takes care of the physical sound channel while the former secures a text where special attention has been paid to the choice of vocabulary, syntax, rhythm and intonation. The possibility of improving audio description or audio introduction through E2R and Clean Audio offers new accessibility hybrid modalities.
- Easy subtitles / captions / SDH – one of results from the DTV4ALL project was the needs for reading comprehension and speed from a new group “slow and fast” readers. This new group came about to challenge previous classification of users to test SDH. To date most studies to check quality in SDH are performed with persons with hearing difficulties (Romero Fresco, 2015). The results from many studies point to the heterogeneity of this classification and user needs. A simpler classification will be to separate people by the reading and comprehension speed: slow and fast. This will embrace an inclusive approach in Accessibility Studies on the one hand, and simplify testing and testing results offering a more robust data. Subtitles / captions / SDH produced with E2R guidelines will be a great help to “slow” readers, and all readers.
- Easy audio subtitles / captions / SDH – If subtitles/captions/SDH are written in Easy to Read, as mentioned in the previous paragraph, the audio version will also be more accessible.
- Easy to Read audio introduction, which again follows the argument for Easy to Read audio description.
- Easy to Read Braille, is also a possibility since the text will be drafted following Easy to Read guidelines, mostly relevant to textual elements.
- Hearing loop and clean audio can also improve listening and comprehension of an Easy to Read text.
- Easy to Read web is the area most developed regarding guidelines, and there are many publications gathered round the 2012 W3 organized Easy to Read symposium.¹⁸

¹⁸ In <https://www.w3.org/WAI/RD/2012/easy-to-read/> (consulted 14/06/2017).

- The capacity of E2R to facilitate comprehension makes it unique and able of being supportive of any other service or even delivering input itself.

5 Conclusions

This article has considered Easy to Read or E2R in its own right as an accessible service, which aims to facilitate comprehension for all, but especially for persons with reading and learning difficulties. As a language variety and method, which ground on text simplification, E2R can be researched and developed on its own but also in conjunction with text-based accessibility services, such as subtitles or audio descriptions. The fact that E2R recommendations and guidelines go beyond language-dependent rules and encompass non-language dependent elements such as non-verbal codes (e.g., illustrations) and paralinguistic features (e.g., layout, typography, prosody, grammatical conventions), may also enable accessibility beyond a screen, as it would be the case in point of web pages or e-documents.

As with most accessible services, Easy to Read can also be combined with existing technology or other access services to improve and heighten accessibility. If for example, subtitles are drafted following E2R, the resulting audio subtitles will also be more accessible. To presume, as in this article, that a new series of easy-to-understand services can join the current AVT landscape has made it possible to start considering it as a research object. However, only with the support of the necessary empirical data, its usability and performance can be understood.

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Chapter 3. Article 2. Easier audio description: Exploring the potential of Easy-to-Read principles in simplifying AD

Summary

This article explores across five sections how workflows and tasks might be affected when cognitive accessibility becomes the prioritised goal in the case of audio descriptions. The first two sections illustrate the nature and intricacies of the access service audio description. The third and fourth put forward its simplification by exploring how the use of Easy to Read may affect workflows and tasks during the creation process. Lastly, the final section summarises the main conclusions.

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Easier audio description: Exploring the potential of Easy-to-Read principles in simplifying AD¹⁹

Abstract

Audio descriptions are not always accessible. This may be because of sound issues, language content or both. This chapter explores the challenge of creating easy-to-listen and easy-to-understand audio descriptions for all, including people with learning difficulties and low reading skills, those with low literacy levels or who are illiterate, and also the elderly, immigrants, refugees and tourists. This chapter describes how audio descriptions can be combined with other accessibility services, such as Clean Audio and easy-to-understand language, resulting in easier-to-understand audio descriptions.

Keywords: easy audio description, easy access services, easy-to-read audiovisual content, accessible digital content, WCAG 2.1, intellectual disabilities, persons with reading and learning difficulties.

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1 Introduction

The audio describer has a similar function to that of the language translator, who has to render the work written in a source language into a target language. The audio describer translates visual language into written text, which is later read aloud. Research on audio description (AD) has focused on both the source and target texts (Braun, 2011). The source text alone is a multi-semiotic and complex matter as it could be anything from a film, a play, an opera or a picture displayed in a museum. An audio description of a Picasso painting, for example, explains not only the picture but also where it hangs, the frame, its size and so forth. The equivalence of the target AD text to its source text is an interesting issue which has received much attention in research (Orero, 2012).

Film is the genre with most AD research (Fryer and Freeman, 2012a, 2014; Fryer *et al.*, 2013; Perego, 2014). Some authors have focused on specific film components such as light (Maszerowska, 2012), secondary details (Orero and Vilaró, 2012), film credits (Matamala and Orero, 2011), leitmotifs (Vilaró and Orero, 2013) and sound (Szarkowska and Orero, 2014; Orero *et al.*, 2016). Paying attention to the source text, Fels *et al.* (2006) looked at text genre, in particular at comedy, and Orero (2016) at TV series. Udo and Fels (2009) narrowed down their research to audio describing theatrical productions, focusing in particular on Shakespeare.

Research on AD has also been undertaken to study the adequacy of the target text and its reception by the audience, i.e., persons with sight loss. The theoretical vacuum regarding concepts such as equivalence or adequacy in AD has been compensated for by the acknowledgement of bottom-up reception studies to understand issues such as audience engagement (Afonso *et al.*, 2010; Chmiel and Mazur, 2012, 2016; Fels *et al.*, 2006; Fryer and Freeman, 2012b, 2014; Wilken and Kruger, 2016). Some authors have narrowed down the audience to children (Schmeidler and Kirchner, 2001; Palomo López, 2008; Orero, 2012, Krejtz *et al.*, 2012) or autistic children (Starr and Braun, Chapter 5 in this volume). Starr and Braun experimented with bespoke (emotive) AD target texts, moving away from visually oriented scripts to consider applications for end-users with cognitive needs. Other authors proposed changes to the target audio-described text to aid comprehension and engagement (Fryer, 2018). These include the audio description delivery speed (Cabeza-Cácares, 2013), the change from third to first person narrative (Udo and Fels, 2009) and the move from traditionally 'flat' to highly creative audio descriptions (Walczak and Fryer, 2017)

There is clear interest from researchers with regards to exploring how AD scripts are produced as a way of understanding what is considered—though never defined—to be quality AD (Fryer, 2018), and furthermore, how this material can best trigger an entertainment experience in the sight-impaired viewer which equates to that experienced by the general audience (ISO/IEC, 2015). Though much research has been carried out on this hybrid, written-oral text type, little research has been performed in relation to efficiency of AD listening and understanding or comprehensibility (Fryer, 2018), nor on enhancing AD (Sade *et al.*, 2012). To fill this gap, the present chapter focuses on two fundamental features of AD: listening and understanding. The hypothesis is that an audio description that is easier to listen to and understand will elicit a better audience comprehension performance and AD which is easy to listen to and easy to understand would contribute to mainstreaming AD.

2 Audio description audiences and functions

Considering the advantages of mainstreaming AD for all audiences, away from the specific needs of persons with disability, and drawing on the Universal Design approach (Story *et al.*, 1998) of working towards a diverse society is a timely task (Orero and Tor-Carroggio, 2018). More specifically, the observation that audio descriptions are useful for audiences other than blind and low-sighted persons opens the opportunity to optimise them both in financial terms (Sade *et al.*, 2012) and for those who benefit from easier-to-understand texts. Moving from the specificity of a blind and partially sighted audience to society in general implies a tweak in the traditional service towards AD for all. It makes it possible to take into consideration new audiences, such as the elderly, who are neither blind nor deaf, but have both hearing and sight loss, or people with learning difficulties and low-level reading skills, children, non-native speakers (including second-language learners) and readers with reduced literacy arising from, for example dyslexia, aphasia or deafness (Shardlow, 2014; Fajardo *et al.*, 2014; Arfe *et al.*, 2017; Inclusion Europe, 2009; European Commission, 2017; Siddharthan, 2014). The rise of this new AD-for-all service will go beyond the classic AD accessibility function. The proposed tweak to the known, existing service is to enhance understandability in order to aid all users. The new AD-for-all service should factor in sound and semantic content in order to aid comprehension.

AD is considered to be an accessibility service, working towards the fulfilment of the UN Convention for the Rights of Persons with Disabilities (CRPD) (Bachmeier, 2014). The traditional function of AD is to offer an alternative communication channel to an audiovisual text, when one of the main channels—the visual channel—is challenged. However, AD has also been found to work towards aiding learning and comprehension (Schmeidler and Kirchner, 2001; Krejtz *et al.*, 2012). Learning both content and languages, and increasing end-user attention (Starr, 2018), have been proved to be areas where the functions of AD have some collateral benefits.

Ultimately however, end-user profiles are too numerous to allow for personalised audio descriptions. The same can be said regarding any cognitive activity: no two users are exactly the same and what one finds easy, engaging or interesting, another may find pointless. Even the same person at different stages or in various situations will have a different response to the same cognitive stimuli. As with AD (for blind or low-sighted persons), text simplification users (second-language learners or low-literacy readers) may react differently; what is simple for one user may be more complex for another. However, Shardlow's (2014: 59) comment that 'a text which is made slightly simpler for one user will generally be easier for most other users' can be applied to audio description, leading to the hypothesis that an easier-to-process audio described text will benefit all.

3 The two departing points for easier audio description

Given the dual nature of the audio description text type—as a text to be read aloud or as an oral text—both writing and listening stages can be made easier to understand. The two points of departure are a simplification of the text and the sound, described in the next two sections respectively.

3.1 Text simplification and Easy-to-Read

There is no general agreement on the definition and naming of the two most common text simplification approaches: Plain Language and Easy-to-Read. According to Shardlow (2014: 59) 'Text Simplification (TS) is the process of modifying natural language to reduce its complexity and improve both readability and understandability. It may involve modifications to the syntax, the lexicon or both.' There are many text simplification models, and all focus on easing information processing (Siddharthan, 2014) and enhancing the cognitive accessibility of texts (Drndarevic *et al.*, 2012). A decreased effort in understanding reduces the cognitive load and the audience's freed resources can be dedicated to enjoyment (Berliner, 2017). Within TS, there are two important elements to define, namely, readability and understandability. The former deals with Easy-to-Read text and is related to complexity of

grammar, length of sentences and familiarity with the vocabulary. The latter according to Shardlow (2014: 59) is

the amount of information a user may gain from a piece of text. This can be affected by factors such as the user's familiarity with the source vocabulary, their understanding of key concepts or the time and care taken to read the text. It may be the case that a text has high readability, but low understandability.

Text simplification relies on both since text can be more readable after lexical and syntactic modifications but still not be understandable, and vice versa. Within the context of this article, it should also be stressed that while readability can be assessed automatically or by humans, understandability requires the involvement of the target audiences (Shardlow, 2014).

As such, readability is extrinsic to the reader and influences the individual resources dedicated to the decoding task (Brueggeman, 2000) whereas understandability is intrinsic and depends on the reader's familiarity with the source vocabulary, their understanding of key concepts or the time and care that were taken to read the text. In this article, readability is considered a concept that relates to linguistic parameters which make a text more or less complex, but also to legibility (Burt, 1949; European Commission, 2009; Siddharthan, 2014; Fajardo *et al.*, 2014). As already defined by Tinker (1963), legibility parameters influence the first interaction between the reader and paratextual elements. These are design-related, language-independent and range from typographical variables such as font-size or font-type to layout ratios such as contrast or text-to-white space (Inclusion Europe, 2009; Yuste Frías, 2012; Nietzio *et al.*, 2014).

Easy-to-Read (E2R) as a user-centric writing workflow includes a validation stage performed by the target audience and has fixed creation guidelines as well as recommendations. Looking at the first issued guidelines by an official standardisation agency—the Spanish Association for Standardisation and Certification (AENOR)—an E2R text has two production avenues: (i) creation or adaptation, which in turn should go through (ii) a validation stage, which is performed not by the writer or adaptor, but by the end user (CEAPAT, 2017). A good example of E2R is the text 'Lead in water' in Figure 3.1 and its adaptation to Plain English and Easy-to-Read.

Figure 1. Chapter 3. Example of text simplification

Lead in Water

Original

Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

Plain English

Lead in drinking water can make you sick. Here are some possible health effects of high lead levels in your drinking water:

Children:

- Delayed growth
- Learning disabilities
- Short attention span

Adults:

- Kidney problems
- High blood pressure

Easy to Read

Lead is a metal.

We can find lead in nature under the ground.

Lead can be toxic to humans and animals. That means that lots of lead in drinking water can make you sick.





Lead makes children and adults sick in different ways.

Children:

- grow slower
- learn harder
- have trouble concentrating

Adults:

- have problems with kidneys
- have high blood pressure

The Original and the Plain English text © www.plainlanguage.gov
 Easy to Read text © EASIT
 Pictures © www.healthdirect.gov.au, toxictapbrisbane.wordpress.com,
guidingexceptionalparents.com, geology.com

Easy-to-Read is related not only to text but also paratextual features, as can be seen in the previous example, where illustrations are added to aid comprehension. Easy-to-Read is one of the most studied simplification methods exclusively for printed text (García, 2012) and currently is receiving more attention in digital content (Nietzio *et al.*, 2014). Finally, Easy-to-Read displays spoken and written characteristics and some have conceptualised it as a distinct language variety (Bredel and Maaß, 2016).

Easy-to-Read can be studied and defined from points of view ranging from linguistics to psychology and graphic design. E2R relates to all linguistic, textual and paratextual elements, and can be studied from any of these areas. The report *Guidelines for Easy-to-Read Materials* issued by the International Federation of Library Associations and Institutions (IFLA) points out the discrepancy regarding its definition:

There are two slightly different definitions of the term "easy-to-read". One means a linguistic adaptation of a text that makes it easier to read than the average text but which does not make it easier to comprehend; the other definition means an adaptation that makes both reading and comprehension easier. (IFLA 2010:3).

Bernabé and Orero (2019) consider E2R as an accessible service which shares linguistic and extra-linguistic aspects with the standard language, while differing from it when it comes to improving readability and comprehension for all, but especially for people with reading, learning or comprehension difficulties.

3.2 *Easy-to-listen audio descriptions*

The reception of audio description is always as a voice service, a soundtrack to be listened to by an audience. As with any soundtrack, it has to be produced, mixed and distributed. AD can be distributed over many platforms, mainly by broadcast or broadband, and in fact by any technology delivering sound. The proliferation of devices allows for AD to be received via any streaming service: that is, a broadcast TV as a separate audio track, on TV as a mixed audio track, via video-on-demand content such as Netflix, from the radio, etc. In relation to AD there are three issues regarding sound: the sound itself, its recording and mixing, and its delivery. Looking at AD sound literature, only two authors (Van der Heidjen, 2007; Rodríguez, 2017) have raised the issue of sound quality, examining in particular sound mixing, and the intelligibility resulting from careless sound treatment. Some AD guidelines touch upon the issue of AD sound delivery, but on a very superficial level. Most guidelines invariably recommend quality—while avoiding its definition. An exception is the UK regulator OFCOM (2000: 10), stating:

When descriptive commentary is inserted into a programme, the background level of programme audio needs to be reduced so that the description can be clearly heard. [...] The narrative voice is fixed at a constant level at the start of the recording but the background level can be adjusted. [...] If possible, music should be faded in and out at the beginning or end of a phrase (as is done by some disc jockeys when talking over music).

This recommendation has, to date, never been objected to or even contrasted with existing sound mix standards dealing with loudness, such as EBU R128 or W3 G56 (W3 G56, n.d.). There are plenty of studies regarding the sound mix when dealing with adverts on TV. A common practice is the automatic increase of the TV sound volume when adverts are shown. To protect consumers from abusively loud sound, standards are applied (EBU R 128, 2014). The loudness adjustment in TV adverts could be compared to that of audio description. There is also audio engineering technology to improve dialogue intelligibility, such as speech enhancement (Dixit and Mulge, 2014) or noise reduction (Chen *et al.*, 2006). In all cases, the objective is to highlight the dialogue with the aim of improving accessibility.

There are many ways to produce the AD soundtrack. The first is in a live context when the AD is produced simultaneously with the described event, and the audio describer is part of the audience. A good example would be a live fashion show. The second is the sound recording by the audio describer with the audio description editor. The third is the automatic text-to-sound reproduction by an application. Finally, a sound recording studio may record,

and then manually mix the different soundtracks: background music, ambient noise, and sound effects. The many additional sounds, which are present for various narrative or aesthetic purposes, may interfere with dialogue intelligibility, and can be modified to improve its reception. Noise reduction and speech enhancement are the most common and current techniques for processing soundtracks in such a way, and could be applied to audio description to improve the original version of the sound by mixing it with the AD track.

Another issue present when delivering audio description is the delivery or reading speed. Some studies point towards the impact of reading speed on AD reception, and advise on controlling the delivery rate (Fels and Udo, 2010; Udo et al., 2010; Fryer, 2016). Snyder (2014) suggested a reading speed of 160 words per minute, which has been adopted by the media industry (Netflix, n.d.), as compared to the average oral reading rate of 183 wpm (Brysbaert, 2019). This reading rate is independent of language and genre. Some studies have determined the reading rate by analysing existing content. This is the case for Ballester (2007) in the Spanish language, where she found the delivery speed variant of 150 to 180 wpm. For English, and looking specifically at children, McGonigle (2007) determined 175 wpm, and Cabeza-Cáceres (2013) found an average of 17 characters per second (CPS) as the delivery rate in Catalan. Jankowska et al. (2017) analysed reading rates for Polish in three films from different genres. The average AD reading rate was calculated at 13.95 CPS for a drama *Ida* (2013), 15.7 CPS for a comedy *Day of the Wacko* (2002), and 15.75 CPS for an action movie *Yuma* (2012). Only one study has carried out experimental research on reception. Cabeza-Cáceres (2013) tested for comprehension and enjoyment of AD delivered at three different speeds: slow 14, medium 17 and fast 20 characters per second, finding that while reading rate does not influence enjoyment, using a slower speed has a positive influence on comprehension.

Despite these advised delivery rates, we find humans do not have a standard ability to process speech (Fields, 2010a, 2010b). The difference in processing may be due to personal disposition or to the incoming sound. As already pointed out, the reception of a sound is influenced by the volume of the sound, prosodic features of the voice, and the level of semantic complexity in the text. Technology now allows personalisation beyond the classic settings such as volume, brightness or contrast on most screens—from TV sets to tablets or smartphones. Choosing the size of subtitles, their position and background is now a potential reality (Mas and Orero, 2017) for audio reproduction in almost all media players.

As with any service that can be personalised, it may seem that no specific research is required. Once its usability has been established, each person will choose the settings preferred either by personal requirements or the situation. A different sound volume is needed when listening to an AD from a smartphone at home or at an open event such as cinema (Walczak, 2017b). The same can be said for audio reproduction, i.e., the end user is able to set the preferred speed, but when reproducing audio description, a high-speed option opens the door to including more text in the available space. This is an interesting proposition: AD text length will depend on the reproduction speed, allowing for more description to be included. Existing media players, such as VLC or Windows, allow for a fast reproduction personalisation. This function applied to AD would allow for a longer and perhaps more explicit narrative, which may lead to an easier-to-understand text depending on the type of semantic content added (Bernabé, 2020).

Finally, research in automation and its reception is also a dynamic area in audio description advancement. In an effort to mainstream accessibility services and to match UN and local regulatory requirements, some work towards automation is being conducted (Starr and Braun, Chapter 5 in this volume). Industry players already offer some solutions as is the case with Microsoft²⁰ and the Japanese public broadcaster NHK.²¹ Within the Audio Description Project, the American Council of the Blind is developing the Algorithmic Automated Description (AAD).²² The AAD is exploring automatic visual tagging technology.

to automate specific aspects of description such as camera motion, scene changes, face identification, and the reading of printed text. Such events could be identified by computer models that automatically add annotations to the video. This would allow such things as the automated announcement of scene changes, or the use of text-to-speech for the reading of on-screen text.

Furthermore, there has been testing for acceptance of the delivery of AD by synthetic speech through text-to-speech technology, which was carried out by Szarkowska (2011), Szarkowska and Jankowska (2012), and Fernández-Torné and Matamala (2015). Their research was performed on persons with low vision or blindness as end users, across audiovisual genres and different voices.

²⁰ <http://www.microsoft.com/en-us/seeing-ai>.

²¹ https://www.nhk.or.jp/strl/open2017/tenji/13_e.html

²² <http://acb.org/adp/articles/vdrdc.html>

The results from all research on the audio channel of the audio description point towards the need to guarantee sound quality. The end user may have an excellent audio description created by a professional team and tested by end users, and yet a bad recording or sound mix will render the AD poor in quality, ultimately becoming a liability to accessibility. This has been shown by Rodríguez (2017) and also in recent work by Walczak and Fryer (2017) through examining the impact of AD delivery. The search for good-quality sound to create an easy-listening AD should be a priority, and prioritised when benchmarking for overall AD quality.

4 Easy-to-understand audio descriptions

Easy-to-understand accessibility services are not established yet as either access services or an academic course. However, the growing demand for cognitively accessible services—triggered by the need to comply with national and international regulations as well as the increased number of scientific publications—has attracted the attention of experts such as linguists, sociolinguists, translators, persons-with-disability associations, social workers and even typeface designers. In this chapter, it is considered in relation to the audiovisual modality, audio description.

After examining the two ways in which to generate an easier-to-understand text (Section 3.3.1) and easier-to-listen audio description, (Section 3.3.2) this section describes steps towards the creation of easier audio descriptions. The approach is based on the combination of four sets of guidelines: (a) existing AD guidelines, (b) Easy-to-Read guidelines, (c) W3C (2018) guidelines WCAG 2.1, and (d) sound mix guidelines. For each step, analysis of the source text, scripting and reviewing, with the aim to facilitate understanding, will be prioritised.

4.1 Steps in the creation of an easier-to-understand audio description

The three steps are analysis of the source text, scripting and reviewing.

First step

The first step in creating easier-to-understand audio description is to check on existing research and guidelines. AD and E2R guidelines recommend a thorough analysis of the source text as the first step (e.g., Remael *et al.*, 2014 for AD; Inclusion Europe, 2009 for E2R). There are two aims: first, to classify the text according to the type, genre, intention and

other characteristics, and second, to identify content which is inaccessible or challenging for the viewer, either visually or cognitively.

With regard to AD, the purpose of describing identified cues is to help viewers to more easily understand specific content, establish meaningful connections between elements, and comprehend the global argument. The importance of a robust coherence when generating an audio description was established by Braun (2007) as a cornerstone of AD creation. According to van Dijk and Kintsch (1983), identifying coherence breaks is an important preliminary step in cognitive text simplification. Coherence gaps may be caused by the order in which the information is presented or by the absence of cues, which force viewers to make their own inferences (Braun, 2007). In easy audio descriptions, coherence needs to be maintained at two levels: for the content itself, and for the operability of the service. Service-related AD materials will be aimed at helping the user understand the functionality of the service and at operating it autonomously during the interaction. Inclusion Europe (2009) has already identified necessary cues for service-related content such as the introduction of the service itself and how to control it, and to present the background voice and its purpose, in for example an audio introduction. A lack of such cues could lead by implication to a lack of coherence.

The identification of content-related AD cues to facilitate coherence is less straightforward. Both IFLA (2010) and Inclusion Europe (2009) superficially address how to identify potential coherence gaps, breaks or difficulties. Both approach it methodologically by providing recommendations and advice involving users in the process. However, both offer limited support with implementation. At this point, it can be argued that all recommendations and guidelines related to creation can also be used to identify coherence gaps. In line with this, all paratextual, linguistic (e.g. lexical, syntactic) and global recommendations can become metrics for coherence. For instance, recommendations such as informing the audience beforehand about the topic or explaining relevant words or concepts and complex words or relationships would help to identify necessary content-related cues. Also of assistance is the recommendation to avoid difficult words. In this case, the Spanish UNE 153101 EX (AENOR, 2018) provides one specific technique, that is, to identify words that cannot be substituted by a suitable synonym. In such a case, a content-related cue explaining the meaning would be necessary.

The fact that we assume in this article that visual accessibility is always subordinated to cognitive accessibility in easy audio descriptions, yields two new types of content-related cues. These are, on the one hand, cues providing information that has already been presented multimodally but needs to be repeated vocally through the AD channel (repetition cues); and on the other, AD cues that can be excluded to avoid cognitive overload, if there are no losses of coherence. Vilaró and Orero (2013) further analysed these cues, also known as 'leitmotifs', and their function as 'anchoring' according to three AD elements: character, object and situation. Through the analysis of leitmotifs in different films and the anchoring effect, Vilaró and Orero (*ibid.*) studied the double coding effect and its function.

Another set of guidelines to be consulted are those issued by the World Wide Web Consortium (W3C, 2018) accessibility guidelines WCAG 2.1. These guidelines offer the possibility of achieving either an AA level of compliance or AAA, the highest level. The recommendations for AA status audio descriptions (pre-recorded) which are housed in Section 1.2.5 of WCAG 2.1, exclusively refer to content that is conveyed visually. In the 1.2.7 Extended Audio Description (pre-recorded) category, which incorporates periodic freezing of the synchronised media presentation so that supplementary audio description can be added (regarded as level AAA), Easy AD for W3C is simply required to be 'easy to understand'.

The criteria for successful understanding as defined in WCAG 2.1 are presented in several sections and are as follows (W3C, 2016):

- 3.1.1 Language of page
- 3.1.2 Language of parts
- 3.1.3 Unusual words
- 3.1.4 Abbreviations
- 3.1.5 Reading level
- 3.1.6 Pronunciation delivers further identification metrics

The first two criteria refer to the need for specifying the main language of a text and those parts that are written in a different language. By doing this, assistive technologies can recognise the language and render the text with the right pronunciation. The third criterion advises using known words instead of figurative language or technical terms. The fourth recommends both avoiding abbreviations because they might be unknown to users and providing access to their written-out form. The fifth criterion concerns the need for providing users either with supplementary information or easier-to-understand versions of content which require proficiency reading levels. As for the last criterion, it demands the provision of support when understanding the meaning of a word depends on a specific pronunciation.

As for service-related content, WCAG 2.1 (W3C, 2018) section 'Understanding Success Criterion 1.3.6: Identify Purpose' (AAA) points out the need for user-understandable interoperability. Though these guidelines are succinct, and drafted primarily with websites in mind, they offer good examples and information regarding the content creation of audio description. For instance, they advise explaining the purpose of the service so that users can benefit from personalisation options without having to know terms that might or might not be familiar to them.

Second step

The second step in AD creation is scripting and the aim is to deliver an easy-to-understand script. Text simplification requires the reduction of the linguistic complexity of a text, adding linguistic information and text elaboration by varying degrees (Arfe *et al.*, 2017). This definition is based on the assumption that removing linguistic complexity at lexical or grammatical levels alone does not necessarily aid (inferential) comprehension, as shown in young less-able readers (Di Mascio *et al.*, 2011) and in second-language learners (Urano, 2000). Current E2R guidelines and recommendations provide text elaboration, text addition and text simplification strategies.

Text elaboration is a process that aims to clarify and explain information and to make connections explicit in a text (Aluísio and Gasperin, 2010). E2R guidelines recognise the benefits of two main techniques, repetitions and explicitness. For instance, the guidelines issued by Inclusion Europe state: 'It is OK to repeat important information', 'Explain the subject', 'Explain difficult words' and 'Use examples to explain things'. Further, the guidelines suggest: 'Where possible, explain the words at the time you are using them' and 'When you change the place of filming, explain where the new place is so people do not get confused' (Inclusion Europe, 2009: 11, 9, 10, 15, 34). As for linguistic additions, in terms of additions of new information, the above E2R guidelines and recommendations also apply: 'Make sure you explain the subject clearly and also explain any difficult words to do with that subject', and 'Always make sure you give people all the information they need' (IFLA, 2010: 9). The risk of potential overload related to text elaboration and text additions is mentioned as well: 'Do not give people more information than they need to understand your point. Only give them the important information' (IFLA, 2010: 17). For the implementation of both elaborations and additions, they refer to linguistic simplification and advise against the use of relative clauses: 'write short sentences' (IFLA, 2010: 22). 'Always keep your sentences short' and 'Use the right language' (Inclusion Europe, 2009: 11, 9).

Van Dyck and Kintsch (1983: 27) stated that 'complex semantic contents can only be expressed or understood clearly with the help of syntax, and syntax can make language communication more efficient'. E2R guidelines also refer to text simplification as lexical and syntactic reduction of the complexity of a text, while trying to preserve meaning and information (Aluísio and Gasperin, 2010). Both IFLA (2010) and Inclusion Europe (2009) include many recommendations. 'Use easy to understand words that people will know well', 'Stick as much as possible to reality', 'Use the same word to describe the same thing throughout your document', 'Do not use words from other languages' (Inclusion Europe, 2009: 10); 'avoid abstract words', 'Do not use difficult ideas such as metaphors' (IFLA, 2010). Syntactic recommendations include using short and positive propositions, avoiding passive language, as well as writing information in a logical and chronological order: 'Always put your information in an order that is easy to understand and follow' and 'Group the information about the same topic together.' However, although these references might suggest the validity of the E2R guidelines, they are experience-based (IFLA, 2010) and still need to be empirically validated as their efficiency can only be proven by the target audience.

Third step

The third step is reviewing, which is often accomplished in standard AD by working together with a blind or visually impaired collaborator (Benecke, 2014; ADLAB, 2014). Easy-to-Read guidelines refer to this task as checking or validation (Inclusion Europe, 2009) and endorse the involvement of the final user. The aim is to validate whether the provided AD cues help the audience to understand the content more easily and to make observations regarding its reception. Thus, validation relates to language and perceivability of the voiced texts through the auditory channel and, additionally, to the viewer's experience.

Regarding perceivability, the reception of audio description depends on the perception and comprehension skills of the viewer. Inclusion Europe (2009) specifies ways to facilitate listening comprehension in general. Clear and high-quality sound, good volume and avoidance of interferences or background noise are necessary in order to support acoustic segmentation and lexical access. The voice should be clear, without accent or dialect, and focused on good pronunciation and clear articulation. There are specific E2R recommendations related to delivery. Inclusion Europe (2009) recommends the insertion of pauses at appropriate points, and to read the text in a way that allows emotions to be perceived. It also states: 'Do not be in a hurry. Do not speak too fast.' A steady motion is preferred. Although there is no direct reference to audio descriptions, these audio recommendations and those regarding consistency in the delivery cannot be ignored at this point.

The brief review presented in this chapter suggests that the creation of Easy AD by combining AD and E2R guidelines and recommendations could help to deliver a pathway for its implementation. Along the way, similarities in approach with other forms of Easy-to-Read have been identified as well as implementation metrics and traits. Dissimilarities were also found, deriving from the predominant role given to cognitive accessibility, to avoid both cognitive overload and loss of coherence. The final aspect of methodological transfer, language adaptation, is discussed in the next section.

4.2 Language adaptation for Easy AD

Writing easy audio descriptions involves multi-semiotic translations and text simplifications that support the enjoyment of multimodal content. As intersemiotic translations, they act as the spoken word, supplying image elements that are conveyed visually—facial expressions, scene changes and sound elements that can only be understood within a visual context. For instance, the sound of a door slamming does not give any indication of the action, whether or not a person is arriving or leaving, or even about the type of door. As text simplifications, Easy AD would be modifications applied to natural language (Shardlow, 2014) to increase understandability. Shardlow (2014) also states that the term ‘simple’ is mostly used in these contexts when in contrast with a complex language. While traditional AD uses rich language, easy audio descriptions would employ less complex or simplified language.

Language in audio descriptions is discussed across all guidelines and recommendations. The overall aim is to avoid tiring the listener due to saturation of information or causing anxiety due to a lack of information. A comparative study conducted by Rai *et al.* (2010) showed a high overlap in language recommendations between research projects. In AD, consistency, accuracy and objectivity prevail whilst also making use of the richness of the language. It is advised to use clear and unambiguous words, as well as impartial and factual language that expresses with precision and details actions and visuals on the screen or display. The use of vivid language is recommended in order to engage the listener. Variety, especially with verbs, is important in order to create images, with adverbs and adjectives tagged as useful, provided they are not subjective. Technical terms should be explained or avoided. Finally, the use of the present tense should be obvious, and sentences simple and short (ADLAB, 2014; American Council of the Blind, 2010).

In Easy AD language, the extent to which these recommendations can be implemented would be subordinate to the primary goals of text simplification and the E2R features. Lexical simplification according to UNE 153101 EX (AENOR, 2018) and the guidelines of Inclusion Europe (2009) seem to rely on finding substitution candidates based on word frequency, word length and sense disambiguation. They recommend using simple, short and common words that do not contain difficult syllables which, for instance, sound the same, as well as avoiding abstract and foreign words. Moreover, they advise against the use of metaphors, irony, proverbs and idioms. They also pinpoint the pitfalls of ambiguity and warn about the use of words that do not clearly designate a concept, such as the words 'thing' or 'something' as well as homonyms and homophones, which should be used only if the context makes clear which concept is signified. The proposed simplifications are illustrated in the following example:

1. *He approached the bank. His mother was waiting.*

In this utterance it is not clear what type of bank that author is referring to.

2. *He approached the bank. His mother was waiting inside.*

In this version the second sentence helps to understand the type of "bank" but the utterance can still be misunderstood.

3. *He approached the bank building. His mother was waiting for him inside.*

This version is less ambiguous.

Regarding syntactic simplification, current E2R guidelines focus on syntactic reordering, sentence splitting, deletions and insertions. They advise only using pronouns if the reference is clear, avoiding passive and progressive constructions, prioritising short sentences without coordinate or subordinate clauses, and using positive sentences over negative ones where possible, or at least avoiding two negative sentences in a row (Inclusion Europe, 2009; AENOR, 2018). Morphological simplifications are also generally considered and addressed in detail according to the particular language: for instance, the Spanish guidelines in UNE 153101 EX advise against using the progressive form as well as verbal periphrases (AENOR, 2018), whereas the German guidelines warn about the use of genitive case, subjunctive mood and past simple tenses (Suter *et al.*, 2016).

Adoption of Easy AD would create an individualistic, hybrid narrative style through the deliberately applied modifications and restrictions, be they lexical and syntactic simplifications, word repetition and choices, text elaborations and additions (explanations, examples, analogies, other) or linear syntactic structures. The yielded descriptions might then be considered as linguistically and stylistically adapted. As with standard AD, their

effectiveness will depend on their degree of cohesion with the other elements of the source text—images, dialogues, sounds, other—and the viewers' reception, which will be evaluated at the validation stage.

5 Conclusion

Contrary to some guidelines proposing rich audio description, in this chapter we propose a shorter, more concise and compact narrative with an enhanced audio. Given the complex nature of audio description production and delivery, improvements can be introduced at all stages to increase its reception (listening) and understanding (comprehension): from a high-quality, clean-sound mix (which should be an objective value measured in decibels) to a script, taking into account Easy-to-Read guidelines. There are also many technological possibilities for the personalisation of AD delivery to make it align with audience needs. This paper has only outlined three areas of audio description components where technology exists and can be successfully implemented to generate a quality, personalised, easy-listening, enhanced audio description. While this chapter has proposed a theoretical approach, the overall objective is to generate a high-quality service that fulfils end-user requirements and expectations.

To summarise, the current framework of Easy-to-Read guidelines across several languages shows that hybrid easy audio descriptions could already be implemented. This article is the conceptual point of departure for a study that will be carried out to analyse the validity of the issues reported. Validation of Easy AD through experience-based results and parallel scientific research will allow us to move forward, paving the way for further hybrid, and multiservice settings such as the combination of easy audio descriptions and subtitling, or Easy-to-Read or easy-to-understand subtitles. As for the latter, authors have already created E2U subtitles within the framework of the EU Horizon 2020 project ImAc²³, which have been validated by end-users in Spain and are currently being tested.

Acknowledgements

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²³ <http://www.imac-project.eu/>

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Filmography

- Day of the Wacko* (2002) Directed by M. Koterski. [Feature film]. Poland: Vision Film Production.
- Ida* (2013) Directed by P. Pawlikowski. [Feature film]. Poland: Solopan.
- Yuma* (2012) Directed by P. Mularuk. [Feature film]. Poland: Yeti Films.

Alternative Text: Figure 3.1**Title: Lead in water****Original**

Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

Plain language

Lead in drinking water can make you sick. Here are some possible health effects of high lead levels in your drinking water:

Children:

- Delayed growth
- Learning disabilities
- Short attention span

Adults:

- Kidney problems
- High blood pressure

Easy to Read

Lead is a metal.

We can find lead in nature under the ground.

((Picture of a mineworker pointing at a wall with lead.))

Lead can be toxic to humans and animals. That means that lots of lead in drinking water can make you sick.

((Picture of a person drinking a glass of water.))

Lead makes children and adults sick in different ways.

Children:

- grow slower
- learn harder
- have trouble concentrating

((Picture of a boy touching his forehead as if he had a headache.))

Adults:

- have problems with kidneys
- have high blood pressure

((Picture of a woman with one hand on her lower back as if she would have kidney pain.))

Chapter 4. Article 3. New taxonomy of easy-to-understand access services

Summary

The article explores the nature of easy-to-understand access services from three different perspectives. Firstly, it compares them semiotically with their standard counterparts by drawing upon and categorising them according to Gottlieb's semiotically-based classification. Then, easy-to-understand access services are explored in their role as digital products that should be accessible throughout the provision chain of the audiovisual product. Finally, like services that aim to enhance comprehension, a classification that comprises different types of quality assessment is provided. The criteria used for categorisation ranged from end-user involvement, compliance with rules and guidelines, and point in time of validation. Lastly, a section that recaps the main conclusions ends the article.

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New taxonomy of easy-to-understand access services

Abstract

The Convention on the Rights of People with Disabilities states that access to information through written and electronic communications is essential for personal development and full participation in society. In digital scenarios, media services, such as audio descriptions, subtitles, or sign language, facilitate access to content with a focus on sensory barriers. Still, there are shortcomings in addressing other needs, such as cognitive ones. This article aims to suggest a taxonomy of the emerging easy-to-understand access services that cater for the needs of audiences who struggle with understanding audiovisual content for varied reasons, such as low literacy, reading or learning difficulties, temporary impairments, or insufficient language skills. The taxonomy uses Gottlieb's (2005) semiotically-based classification to define E2U access services within the landscape of Audiovisual translation and to classify them according to their semiotic identity as compared to the standard access services.

Keywords: Cognitive accessibility. Easy to Read. Plain Language. Text simplification. Easy-to-understand accessibility services.

1 Introduction

Audiovisual text is conveyed by both audio and visual channels. Viewers listen and view the information as they begin to decode the message and create meaning. In this process, sensory reception and language skills seem to be critical. Hence, if challenged, understanding and communication could be at stake.

The Audiovisual Translation (AVT) modes subtitling and dubbing emerged to overcome language barriers. Today, the AVT landscape has expanded and includes access services to address the needs of audiences with sensory disabilities. For instance, audio descriptions render content aurally that would usually only be conveyed visually. Similarly, intralingual subtitles provide audiences with hearing loss with written translations of the spoken text.

The question arising is whether audiovisual content provided by these access services is also cognitively accessible for audiences such as: (a) users who can see but struggle reading or understanding written content; (b) users who can see and hear but have difficulties understanding content; and (c) users with multiple needs: for instance, a user may have hearing loss and also have problems reading subtitles or a user with visual loss may have difficulties understanding a dense audio description that is provided as an alternative.

Until today, there is no common definition of cognitive accessibility (Johansson 2016), although it has been studied from many perspectives such as linguistics (Siddharthan 2014; Arfé, Mason & Fajardo 2017), web accessibility and digital inclusion (Sevilla, Martínez & Alcantud 2007; COGA 2018), inclusion (Verdugo & Schalock 2010), education (Vived & Molina 2012; Belinchón, Casas, Díez & Tamarit 2014), information design (Johansson 2016), computer science (Shardlow 2014), accessible cities (CEAPAT 2015), and e-learning (Olivetti Belardinelli 2008). In the field of AVT, new so-called easy-to-understand (E2U) or easy services are now being described (Bernabé & Orero 2019).

These E2U access services depart from the standard access services and use simplification methods such as Plain Language (PL) or Easy to Read (E2R) to enhance cognitive accessibility of audiovisual content. For instance, E2U audio descriptions (Bernabé & Orero forthcoming), E2U subtitles (Bernabé et al. forthcoming; Oncins et al. 2020), and simplified respeaking (Eugeni 2017). Research within AVT Studies is now also being conducted, e.g., in the EU co-funded EASIT project,²⁴ which is catering for the need for training material and

²⁴ <http://pagines.uab.cat/easit/en>

recommendations to create easy-to-understand audiovisual content, and the EU H2020 project ImAc,³ which is currently testing the reception of E2R subtitles in immersive contexts. All these efforts and approaches share the goal of improving cognitive accessibility, which Johansson (2016: 20) defines as follows:

Cognitive accessibility is the extent to which products, systems, services, environments and facilities can be used by people from a population with the widest range of cognitive characteristics and capabilities to achieve a specified goal in a specified context of use.

A legitimate question at this stage would be whether E2U access services are exactly equivalent to the standard access services they emerge from and, thus, only differ in the use of a “more simple language” or whether they display idiosyncratic features and have their place within AVT. To answer this question, this article explores the semiotic composition of E2U access services as compared to their standard counterparts. To this end, it departs from Gottlieb’s (2005) taxonomy and draws upon both the previous definitions and the presumption that cognitive characteristics of standard access services—or more generically audiovisual content—are modifiable. This singularity provides leverage to enhance their cognitive accessibility when they are designed according to valid guidelines, such as WCAG as proposed by Johansson (2016), and according to simplification guidelines and recommendations, such as PL and E2R as it is suggested in this article.

2 Easy to understand meets Audiovisual Translation

The term “easy-to-understand”²⁵ is used in this article as an umbrella term to describe content, methods, products, or services that rely on text or graphical simplification to enhance their cognitive accessibility during the interaction with the user. In this sense, E2U access services provide audiovisual content through E2U-designed access services. The overall goal pursued is to make audiovisual content accessible to audiences with the widest range of cognitive characteristics and capabilities.

Because interaction begins at an early stage, with users navigating and browsing through search engines, menus, and options before they reach the actual audiovisual content, E2U access services must approach accessibility throughout the entire provision chain. This broader definition of access services is in line with Articles 9 and 21 of the Convention on the Rights of Persons with Disabilities (CRPD) (United Nations 2006) and also endorses the view

²⁵ This term has already been used by Inclusion Europe (2009), IFLA (2010) and is equivalent to the term ‘easy’ introduced by Bernabé & Orero (2019).

that accessibility should encompass content, design, and technology. This article defines E2U access services in these terms and expands on how these demands can be taken into consideration in Section 3.

Simplification, text reduction, reformulation, condensation, omissions, and decimation are terms already attached to the field of Audiovisual Translation (AVT). They relate to the way different access services overcome textual, situational, or technical constraints. For instance, space or time restrictions in subtitles (Gottlieb 1992, 2005; Marinetti 2012); speech-related challenges in real-time, intralingual subtitling (Eugeni 2008; Eugeni & Bernabé 2020); or genre-related constraints, as is the case in audio descriptions for children or young audiences (Orero 2011). Though standard access services use such simplification strategies to support understandability, their focus is to provide an alternative way of conveying content when one of the main channels, visual or aural, are challenged. Conversely, in this article, it is presumed that E2U access services subordinate visual or aural accessibility to cognitive accessibility and, thus, are not functionally equivalent with their standard counterparts.

As translations that derive from standard access services, E2U content aligns with translation approaches that allow for the incorporation of “alterations and new perspectives” (Díaz Cintas 2004: 31), consider “audiences with different socio-cultural and socio-linguistic backgrounds and expectations” (Gambier 2003: 178), and allow for wider understanding of translation beyond an “interlingual, conventionalised and isosemiotic translation” (Gottlieb 2005: 43). These perspectives are, for instance, Transadaptation (Gambier 2003), Descriptive Translation Studies (Holmes 1972; Toury 1995; Díaz Cintas 2004), or Multidimensional Translation (Gerzymisch-Arbogast 2005; Gottlieb 2005; Gerzymisch-Arbogast 2007).

According to the semiotically based parameters provided by Gottlieb’s, E2U content can be classified as translations that (a) comprise types of communication “not involving language in a traditional way”, (b) act as “text enhancers” and focus on how the target texts are cognitively perceived, and (c) acknowledge the translation product as “more free” and “less predictable” (Gottlieb 2005: 33, 37).

As for their non-standard use of language, Plain Language and Easy to Read converge with the semiotic approach in two ways. First, in its view of “language” as an “animate communicative system working through the combination of sensory signs”, meaning verbal and nonverbal elements (Gottlieb 2005: 35). PL and E2R rely on verbal codes, paratextual and prosodic features (e.g., typographical choices, intonation, speed of voice), and nonverbal elements (e.g., nonverbal illustrations, pictograms, or ideograms). Second, PL and E2R

deviate from standard use and style recommendations. For instance, both build upon the use of repetition (e.g., lexical and syntactical), short sentences, explicitness, and syntactic redundancy (Inclusion Europe 2009; PLAIN 2011).

As for the cognitive reception of texts, E2U access services address audiences that need support by decoding and understanding the content for various reasons. They act as text enhancers that support understandability in different ways. For instance, by reducing the terminological or syntactic load, by adding linguistic information or nonverbal elements to either make the message more explicit or to activate prior knowledge (Arfe, Mason & Fajardo 2017; Wengelin 2019), or by providing knowledge that is considered as presupposed. These enhancing strategies draw upon the assumption that removing linguistic complexity on a lexical or grammatical level alone does not necessarily aid (inferential) comprehension, as shown in young or poor readers (di Mascio, Gennari & Vittorini 2011) and L2 learners (Urano 2000). In Translation, these strategies to secure cohesion are referred to as universals of translation (Laviosa-Brathwaite 2001).

To sum up, in this article simplification is considered both reductive and additive. Thus, E2U translations are considered to act as “text enhancers” and “thus boosting the impact of the original figures [texts], which on their own terms may not be cognitively, fully comprehensible to the audience” (Gottlieb 2005: 37). This primary role as text enhancers does not exclude the other functions attributed by Gottlieb (2005) to translations: text substitutes, translations crossovers, or supplements. However, this taxonomy subordinates them to their primary role of E2U content as text enhancers.

As for the extent to which E2U translations are “more free” and “less predictable”, translations that use sets of “rules” are considered in Gottlieb’s taxonomy as “conventionalised” translations (Gottlieb 2005: 36). As such, they are predictable and closer to the original, and allow “to reconstruct the original from the translated version [...] — to a certain extent —”. Though the creation of E2U translations adheres to the guidelines and recommendations of PL and E2R, it would not be possible to reconstruct the source text after simplification. And, thus, E2U translations are considered inspirational translations.

All things considered, the AVT landscape can expand and incorporate easy access services (Bernabé & Orero 2019), which both originate from their standard counterparts (e.g., audio descriptions, subtitles) and deviate from them to fulfil their function as “text enhancers” (Gottlieb 2005: 37). As translations, E2U access services are inspirational, however, regulated by recommendations and guidelines arising from: (a) text simplification guidelines and recommendations; (b) guidelines governing the underlying standard access service

(e.g., audio description or subtitling guidelines), and (c) digital accessibility guidelines as explained in section 3. The differences with the standard access services arise from a non-standard use of language and an idiosyncratic and combined use of semiotic codes (verbal and nonverbal), which include elaborating or adding new elements to make audiovisual content cognitively more accessible.

The next section explores the use of simplification methods to create E2U content for access services.

2.1 Standard access services meet simplification methods

Simplification methods can make content more cognitively accessible (Arfe, Mason & Fajardo 2017) and, thus, reduce the cognitive load that users experience during the interaction. These methods can be classified as verbal or nonverbal based on the semiotic codes they use.

As for verbal simplification methods, they can be classified into text simplification methods or easifications. Text simplification methods modify the original text manually or automatically, by either reducing their linguistic complexity, adding linguistic information, or by text elaboration (García 2012; Siddharthan 2014). Conversely, easifications maintain the unchanged original and provide readers with so-called “easification devices”. These devices are organisation strategies (e.g., restructuring, reorganising, rearranging) for presenting the text “without in any way modifying or mutilating the lexis or the syntax of the text” (Bathia 1983). Lastly, as for nonverbal simplification methods, they rely on graphical symbols such as pictograms or ideograms (Tuset et al. 2011).

The classification provided in this section considers two verbal methods—Plain Language and Easy to Read— and also nonverbal simplification through graphical-symbols, whereas it excludes easification for three main reasons. First, the use of easification devices would not be viable, for instance, in TV shows or movies; second, they will hinder enjoyment; and, third, they would exclude simplification in real-time and live situations. Nonetheless, text simplification also bears risks as pointed out by Bathia (1983), since based on assumptions made by the adapter, the changes in lexis and elaborations may not fully transfer the original meaning, and it does not help readers to develop their own coping strategies for a specific text.

Plain language and Easy to Read are both text simplification methods that aim to make information accessible and to enable self-determination and self-advocacy (Cornelius

2010). They have emerged to cover needs arising from two different fields. The Plain Language Action and Information Network (PLAIN) states “Plain Language is communication your audience can understand the first time they read or hear it.” (PLAIN, n.d.). Plain Language emerged in the United States in the past century triggered by the need for “making legal, government, and economic texts accessible to lay-readers” (García 2012). PL development was top-down, promoted by the Government and supported by financial institutions that were facing legal suits coming from consumer associations (Berent 2010). As a method, Plain Language builds on recommendations related to the design and linguistic simplification—syntax, grammar and lexis.

Conversely, the development of E2R was bottom-up and triggered by end-user associations, such as People First in the United States in the 70s, to protect and promote the rights of people with diverse intellectual and learning capabilities. In Europe, the umbrella end-users association Inclusion Europe (IE) has been working since 1988 towards the same goals. Its efforts led to the Easy to Read guidelines *Information for All* in 2009, which are available in 16 languages. As opposed to Plain Language, Easy to Read primarily targets the needs of persons with diverse intellectual and learning capabilities (IFLA 2010; Inclusion Europe 2009).

The document entitled *Guidelines for easy-to-read materials* by the International Federation of Library Association and Institutions (IFLA) provides two definitions of the term Easy to Read and explicitly relates to the second one (IFLA 2010: 3):

One means a linguistic adaptation of a text that makes it easier to read than the average text but which does not make it easier to comprehend; the other definition means an adaptation that makes both reading and comprehension easier.

Both definitions draw upon three main underlying concepts: legibility, readability, and understandability. Legibility is related to the first interaction between the reader and paratextual elements, as defined by Tinker (1963). Legibility parameters are design-related, language-independent, and range from typographical variables such as font-size or font-type to layout ratios such as contrast or the ratio of text to white space (Inclusion Europe 2009; Yuste Frías 2012; Nietzio, Naber & Bühler 2014). Readability is a wider concept. It relates to linguistic parameters that make a text more or less complex, but also to legibility (Burt 1949; European Commission 2019; Siddharthan 2014; Fajardo et al. 2014). Lastly, understandability refers to the personal ability of a reader to infer meaning from a text (e.g., literal, inferential) (Siddharthan 2014). Understandability depends on external variables (e.g., light, brightness, background noise) and intrinsic ones such as reader motivation and prior knowledge.

According to these definitions, readability is extrinsic to the reader and influences the individual resources dedicated to the decoding task (Brueggeman 2000). Readability can be improved by manual and automatic simplification methods (García 2012; Shardlow 2014), whereas understandability is intrinsic to the user and depends on “the reader’s familiarity with the source vocabulary, their understanding of key concepts, or time and care that were taken to read the text” (Siddharthan 2014). In this article, these concepts are defined in these terms.

In summary, E2R and PL are text simplification methods based on paratextual and linguistic rules and recommendations that aim to improve readability and to support understandability. They can therefore be used to enhance the cognitive accessibility of AV content. The resulting E2U content would be verbal as opposed to nonverbal content, which would rely on graphical symbols²⁶.

To the author’s knowledge, pictogram methods do not yet exist as E2U nonverbal access services. However, there are already digital products (e.g., web applications, software) that use this form of nonverbal mediation: for instance, Text2Pic, Proloquo2Go, iPicto, Pict-Net, and AraBoard. In AVT, the use of graphical symbols has been studied in subtitles for the Deaf and hard-of-hearing as was the case in the EU co-funded project DTV4All.⁶ Currently, non-verbal graphical symbols such as arrows are being tested as orientation aids in combination with subtitles in immersive settings in the EU co-funded project ImAc.

The next section uses ‘Simplification method’ as a parameter to classify access services that use simplification strategies emerging from the methods described. The classification focuses on how the use of such methods transforms the properties of standard access services (e.g., subtitles, audio descriptions) in terms of semiotic composition. The extent to which they support or improve understandability is excluded at this stage since understandability is intrinsic to the person and must be validated by end-users (Inclusion Europe 2009; IFLA 2010; Shardlow 2014). However, this article acknowledges its importance and includes in Section 4 a classification of E2U audiovisual content according to two parameters: (a) Validation goal and (b) Validation point in time.

A classification based on Gottlieb’s taxonomy facilitates an understanding of how E2U access services may differ in their semiotic composition, identity, and channels, from the

²⁶ For simplification purposes, the term ‘pictogram’ is used to refer to graphical symbols, pictograms, and ideograms.

standard access services when they use verbal and nonverbal simplification methods to make AV content easy to understand.

The operationalisation of the parameter Simplification method yields two types of services according to their semiotic identity, namely verbal or nonverbal. While verbal access services may include both verbal elements exclusively or a combination of verbal and nonverbal ones, nonverbal access services are limited to nonverbal elements.

Simplification method:

- E2U verbal access services
- E2U nonverbal access services

2.2 Semiotic composition of E2U access services

Gottlieb's taxonomy (2005) classifies standard access services by comparing their semiotic composition with that of the original texts. The categorisation considers two parameters: a) their semiotic identity, which refers to the use of verbal or nonverbal codes, and b) the semiotic channels available in the communication.

As for their semiotic identity, access services can be "intrasemiotic" and subsequently employ the same verbal or nonverbal code(s) as the original— for instance, in dubbing and subtitling (verbal-verbal)—or can be "intersemiotic" and thus use a different code(s)—as is the case with audio descriptions (nonverbal-verbal).

As for the semiotic channels, this aspect refers to the semiotic channels available to the audience. Whenever audiences can access the content through the same channels as with the original version, the access services are called "isosemiotic". If the available channels are different, they are called "diasemiotic"—e.g., subtitles convey the original (aurally delivered) content through the written (visual) channel. Lastly, semiotic channels can also be "supersemiotic" or "hyposemiotic" depending on whether there are more or fewer channels available than for the original.

Similarly, this section classifies E2U access services based on their semiotic composition. At this point, a first definition of E2U access services is proposed:

Easy-to-understand access services use simplification methods, verbal or nonverbal, to make audiovisual content accessible for users with the widest range of cognitive characteristics and capabilities.

As for their semiotic identity, while E2U nonverbal access services encompass methods that use exclusively nonverbal elements (e.g., pictogram methods), E2U verbal access services employ both methods that use only verbal codes and methods that combine verbal and nonverbal elements (e.g., PL or E2R and pictograms).

As for the semiotic channels available to the user, this taxonomy presumes that E2U access services are channel-equivalent with the standard services. In this sense, an E2U dubbed movie would use the same channels as the standard dubbed movie and, thus, be channel-equivalent. Additionally, an E2U audiobook and a standard audiobook would both be diasemiotic compared to the original. This is the case because the reader, or, better said, the listener, would perceive the information aurally, compared with the visual channel used in the original book. Another example of channel equivalence between a standard access service and the E2U counterpart would be when both are hyposemiotic as is the case for subtitles and E2U subtitles for persons with hearing loss. Nonetheless, the taxonomy acknowledges that the degree to which an E2U access service is channel-equivalent to the standard service depends on the sensory and cognitive capabilities of the audience.

The fact that simplification also considers additions and elaborations as strategies to enhance understandability has led in this taxonomy to include a new category named “enhancing”. The name is inspired by the underlying “cognitive decoding activity” of “translations as text enhancers” as defined by Gottlieb (2005: 37). The category “Enhancing” is used to describe E2U access services that add verbal or nonverbal semantic material as a simplification strategy. This approach is complementary to the “deverbalising” and “verbalising” ones described by Gottlieb (2005: 37), which focus on replacing verbal elements with nonverbal ones. Examples of “enhancing” services are provided in the sections below.

In digital accessibility contexts, such additions already exist as is the case with so-called “extended audio description”. The Web Content Accessibility Guidelines (WCAG 2.1) describe them as audio descriptions that stop the audio and video briefly to provide “critical information” that cannot be included otherwise due to time constraints (W3C 2016).

E2U nonverbal services

E2U nonverbal services use nonverbal simplification methods²⁷, such as pictograms, to adapt²⁸ the audiovisual content. They are:

²⁷ For simplification, the term ‘pictogram methods or services’ will be used to refer to access service that use graphical symbols, being them pictograms, ideograms, emojis, etcetera.

- intrasemiotic, when they use the same nonverbal code or codes as in the standard access service, or
- intersemiotic, when they use different nonverbal codes compared to the standard access service.

The following table shows some examples.

Table 1. Chapter 4. Examples of nonverbal E2U access services

Nonverbal E2U access services	Examples
<ul style="list-style-type: none"> • intrasemiotic or • intrasemiotic and enhancing 	<ul style="list-style-type: none"> • Easy pictogram • Easy sign language²⁹ • Easy music arrangements
<ul style="list-style-type: none"> • intersemiotic or • intersemiotic and enhancing 	<ul style="list-style-type: none"> • Easy pictogram versions of: <ul style="list-style-type: none"> ○ Intertitles, subtitles, surtitles, etc. ○ Written explanations³⁰ ○ Written summaries • Easy music arrangements based on other nonverbal content

Intrasemiotic, nonverbal, E2U access services would use the same nonverbal code(s) to adapt the audiovisual content. For example; an E2U access service that uses easy pictograms to adapt a pictogram access service would be nonverbal and intrasemiotic. Similarly, an E2U access service that uses E2U sign language to adapt an access service that uses sign language would also be intrasemiotic and nonverbal. In these cases, both access services use the same signs and, thus, sign-equivalent.

Whenever the adaptation involves adding new, nonverbal material as new content to improve understandability, the E2U access services would also be “enhancing”. It is this additive layer which will make EU2 services differ semantically from the standard ones. Lastly, as per definition, E2U nonverbal access services exclude intralingual and interlingual forms.

²⁸ The terms “to adapt” and “adaptation” are often used in E2R contexts to describe the creation of E2U texts both either from scratch or from standard content (Inclusion Europe 2009; IFLA 2010; CEAPAT 2015). The terms refer to the changes made to a text to make “both reading and comprehension easier”, as explained in the definition provided by IFLA (2010).

²⁹ Though sign language also uses verbal elements to support the nonverbal signs, the main semiotic code is considered to be nonverbal.

³⁰ Explanations are considered here as texts which provide audiences with additional information. Explanations aim to express content. They can be visually or aurally conveyed and include informative and descriptive information.

Intersemiotic, nonverbal, E2U access services would adapt the audiovisual content by either using a different nonverbal code(s) compared to the standard access service or by adapting verbal content, making it nonverbal. An example of the latter would be an E2U access service which provides E2U pictograms of verbal subtitles. Similarly, an E2U access service may provide an easy-music arrangement based on E2U pictogram content.

Intersemiotic, nonverbal E2U access services cannot be deverbalising or verbalising since they would then be verbal access services. However, they can be enhancing and add nonverbal semiotic material as compared to the standard access services.

To sum up, the examples show that nonverbal simplification methods such as pictograms can be used to create E2U nonverbal access services. These services would either have the same semiotic identity as the standard and, thus, be intrasemiotic or use different nonverbal codes and, thus, be intersemiotic.

Both intrasemiotic and intersemiotic types can also be “enhancing”. In such cases, the amount of semantic and semiotic material would be different. Intrasemiotic E2U access services would convey the semantic load of the message by adding new material of the same kind, whereas intersemiotic ones would use different codes.

The next step towards the development of such services would be to describe them and to conduct reception studies to evaluate their acceptability and usefulness in terms of understandability, viability, and cognitive load.

E2U verbal services

E2U verbal services reach simplification by using methods that rely on verbal codes either exclusively or in combination with nonverbal elements. They can be:

- Intrasemiotic, when they use the same codes as the standard counterpart. For instance, standard intralingual subtitles and E2U intralingual subtitles.
- Intersemiotic, when the codes differ. For instance, E2U intralingual subtitles that combine text and pictograms.

Intrasemiotic E2U verbal services use the same verbal or verbal-nonverbal code(s) as the standard service. They are intralingual, when they use the same language, or interlingual, when the language differs. In both cases, they can be “enhancing” and add new semantic material, either of the same semiotic type and, thus, be intrasemiotic or of a different type and, thus, be intersemiotic.

Figure 1. Chapter 4. Example of E2R intrasemiotic and intralingual subtitles³¹



Intersemiotic E2U verbal services can emerge from either non-verbal or other verbal access services. In the first instance, E2U verbal services adapt the nonverbal audiovisual content using verbal elements and, thus, can be described as “verbalizing” (Gottlieb 2005: 37). In its role, “enhancing” elements would add verbal elements.

In the second case, intersemiotic, E2U verbal services can also emerge from adapting verbal access services by using either nonverbal elements to replace the verbal ones and, thus, be “deverbalizing” (Gottlieb 2005: 37) or by additions and, thus, be “enhancing”.

For instance, intersemiotic, E2U verbal subtitles can be:

- verbalising: e.g., E2U subtitles for sign language texts.
- deverbalizing: e.g., E2U subtitles that also use nonverbal elements (e.g., pictograms), which were not part of the original subtitles.
- enhancing: e.g., E2U subtitles that describe a sculpture and provide additional background information before the actual description of the piece of art.

The table below sums up the parameters to classify E2U verbal services.

³¹ Validated by end-users within the ImAc project (Bernabé et al. 2020).

Table 2. Chapter 4. Classification parameters for E2U verbal access services

	Verbal		
	Plain Language	Easy to Read	Pictogram
Intrasemiotic	intralingual, interlingual, enhancing		
Intersemiotic	deverbalising, verbalising, enhancing		

The operationalisation of the parameters allows us to classify any E2U verbal access service as shown in the next table.

Table 3. Chapter 4. Examples of E2U verbal access services

Semiotic identity	E2U access service (auditory)	E2U access service (visual)
<ul style="list-style-type: none"> • Verbal, intrasemiotic, intralingual • Verbal, intrasemiotic, intralingual, enhancing 	E2U audio <ul style="list-style-type: none"> • comment • description • explanation • intertitles • introduction • subtitles • summary • surtitles • remake • sight translation • voice-over 	E2U <ul style="list-style-type: none"> • intertitles • intralingual subtitling (recorded)³² • real-time intralingual subtitles • surtitles • written explanation • written summary
<ul style="list-style-type: none"> • Verbal, intrasemiotic, interlingual • Verbal, intrasemiotic, interlingual, enhancing 	All the above as well as: E2U <ul style="list-style-type: none"> • consecutive interpreting • simultaneous interpreting 	E2U interlingual <ul style="list-style-type: none"> • subtitling (recorded) • intertitles • real-time subtitling • surtitles • written explanation • written summary
<ul style="list-style-type: none"> • Verbal, intersemiotic, 	Adaptations such as: <ul style="list-style-type: none"> • pictogram to E2U audio 	Adaptations such as: <ul style="list-style-type: none"> • pictogram to E2U subtitles

³² Encompasses subtitles for persons with hearing loss and other audiences

Semiotic identity	E2U access service (auditory)	E2U access service (visual)
verbalising • Verbal, intersemiotic, deverbalizing • Verbal, intersemiotic, enhancing	access services • an E2U audio description of a sculpture	or any of the services mentioned above • E2U written explanation or description of a sculpture • E2U summaries of a text which uses both verbal elements and pictograms

To sum up, the use of verbal simplification methods to create E2U access services changes the semiotic identity of the standard access service in some cases. As is the case in nonverbal E2U access services, they can display either the same semiotic identity as their standard counterparts or differ when the codes are different. Equally, the amount of semantic and semiotic material may vary.

Again, the next step would be to create this material and conduct reception studies. It could be presumed that Easy to Read access services are more challenging to implement than Plain Language ones as some E2R guidelines may diverge from those of the standard access services. For example, subtitling guidelines concerning length and speed may conflict with specific E2R rules such as starting each sentence on a new line or being explicit. Such particularities demand the development of idiosyncratic guidelines for E2U services such as subtitling or audio descriptions.³³

The next two tables display the classification parameters and provide examples of E2U access services according to their semiotic identity.

Table 4. Chapter 4. Classification parameters for of E2U access services

	Verbal			Nonverbal
	Plain Language	Easy to Read	Pictogram	Pictogram
Intrasemiotic	intralingual, interlingual, enhancing			enhancing
Intersemiotic	deverbalising, verbalising, enhancing			enhancing

Table 5. Chapter 4. E2U access services

E2U access service	Auditory	Visual
Nonverbal -intrasemiotic, -enhancing	Not known	-Easy pictogram -Easy sign language
Nonverbal -intersemiotic, -enhancing	Not known	Pictogram-based adaptations of verbal access services: Pictogram-based intertitles, subtitles, surtitles, written summaries
Verbal -intrasemiotic, -intralingual or interlingual, -enhancing	E2U (PL or E2R) audio comments, audio description, audio explanation, audio intertitles, audio introduction, audio subtitles, audio summary, audio surtitles, remake, sight translation, voice-over	E2U (PL or E2R) intertitles, intralingual subtitles, real-time intralingual subtitles, surtitles, written explanations, written summary
Verbal intersemiotic -deverbalizing -verbalizing, -enhancing	Any adaptation of pictogram E2U audio access services	Any adaptation using only verbal elements or both verbal and nonverbal

2.3 Conclusions

The undertaken classification shows that the semiotic identity of E2U access services is not always equivalent to that of standard access services. Moreover, it brings to light the fact that these translations as text enhancers will not always comprise the same amount of semiotic material. Given that they are inspirational translations to enhance

understandability, the type of information that they convey may also be different, as previously described by Bernabé and Orero (2019b) with regard to the selection of E2U audio description cues.

The classification has also shown that E2U access services have idiosyncratic properties such as their non-standard use of language, function, and semiotic characteristics, which enable them beyond the “transversal property” of a given standard access service.

3 E2U access services meet WCAG 2.1

The increasing digital nature of audiovisual products, the high relevance of accessibility within the audiovisual media landscape, and the lack of a defined value chain for these services (European Regulators Group for Audiovisual Media Services [ERGA] 2016) calls for alignment of audiovisual access services with the Web Content Accessibility Guidelines (WCAG), in their current version 2.1 or future ones, as pointed out by Bernabé and Orero (2019; forthcoming).

WCAG are an internationally recognised set of requirements for the design of accessible digital resources on the web (W3C 2018). The guidelines result from the collaborative work by the World Wide Web Consortium’s Web Accessibility Initiative (WAI) since it was founded in 1997.

The WCAG guidelines define accessibility for digital content around four accessibility principles: perceivable, operable, understandable, and robust. Each principle encompasses guidelines and sets of success criteria to test their level of conformance: A (lowest), AA, and AAA (highest). Furthermore, the guidelines provide a repository of techniques for implementation. Though compliance with WCAG does not guarantee web accessibility, they have become a recognised quality and harmonisation standard of best practices. Currently, they are adopted by laws in 21 countries, in the EU and by Section 508 of the Rehabilitation Act in the United States (Enamorado 2019).

The four accessibility principles pose different demands on audiovisual services. The ‘perceivable’ principle requires accessibility of content and interface elements to be made via at least two different sensory channels. ‘Operability’ demands the provision of input alternatives to the mouse, meaning accessibility through the keyboard or other devices that emulate them. ‘Understandable’ asks for meaning in terms of language and functionality at any point of the interaction. Lastly, ‘robust’ calls for a stable compatibility between systems and technologies by means of interoperability.

The principles 'operable' and 'robust' are the more technical ones. However, if not considered, they might halt the interaction either partially or entirely. In this sense, a keyboard user may, for instance, be able to browse a TV show but find barriers when it comes to operating the player; in other cases, users who only have access to older technologies may be unable to interact if there is no accessibility API for communication.

'Perceivable' and 'understandable' are the principles that relate more closely to the AV modalities. The first one focuses on access through alternative sensory channels and thus already includes AV modalities such as audio descriptions, captions, or sign language. Legibility indicators are paratextual elements (Yuste Frías 2012) that support perceivability and also include: contrast, colour, size, good sound, layout, and others. Lastly, the 'understandable' principle builds upon the principles of 'perceivable' and 'operable', and capitalises on comprehension by means of improving readability, reducing the cognitive load during the interaction, and providing assistance, where necessary.

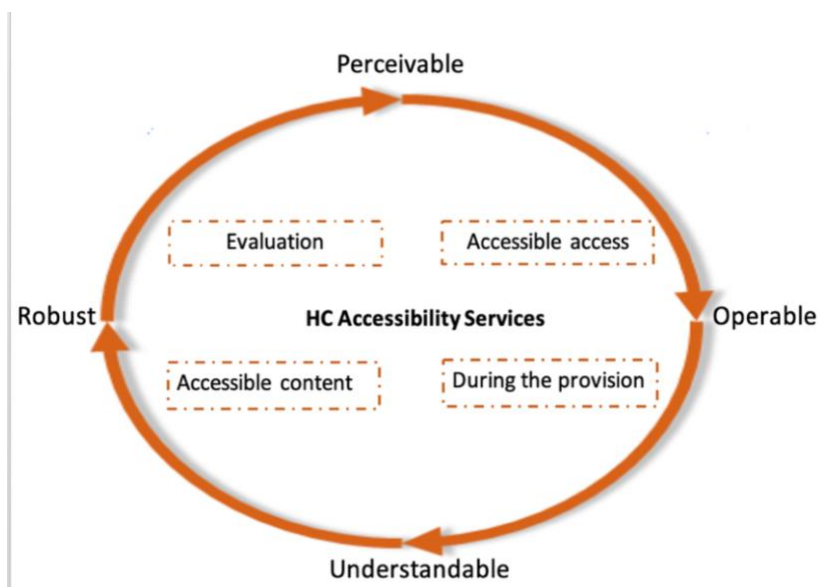
Within AVT, the principles of digital accessibility harmonise with the accessibility factors introduced by Gambier (2004). Thus: (a) legibility and synchronicity refer to the perceivability of the translation product; (b) readability, relevance, domestication, and acceptability relate to understandability; and (c) as (digital) products, they must meet user expectations (domestication) regarding the way they can be operated, the terminology used in the interface (acceptability, legibility, readability, and relevance), and the way in which they communicate with other systems—robustness—(acceptability, domestication).

As providers of an alternative way of communication (Bernabé & Orero 2019), access services that embrace the principles of digital accessibility must, therefore, be available to the widest range of users regardless of their age, ability, and technology throughout the provision chain. From this perspective, the concept of services cannot be limited to the product, for instance, a subtitled or audio-described film, but it should rather encompass the so-called accessibility chain as defined by the Spanish standard UNE 170001-1.

As the standard defines, "[t]he accessibility chain will comprise all elements that allow users to carry out all activities and tasks during the interaction" (AENOR 2007: 5). This approach has already been claimed by the authors Moreno, Martínez and Ruiz (2007) for digital products such as videos. In this article, this perspective is used to identify parameters to categorise the degree of accessibility of access services during the interaction, which starts at the very moment the user decides to use the service, extends throughout the provision of the access service, and expands beyond it, as it becomes part of the user experience.

The human-centred (HC) approach to the design of digital products cannot be left aside. Though the scope of this work does not allow for the exploration of this topic, it goes without saying that accessibility and Universal Design put users at the centre of their actions, as stated in their slogan: “Nothing About Us Without Us” (Zero Project 2014). Figure 2 illustrates how digital principles can be considered throughout the provision of access services and can follow a human-centred approach.

Figure 2. Chapter 4. HC accessibility chain of access services



This HC approach would enable the categorisation of access services according to two parameters:

1 Degree of accessibility of the service

- a. fully accessible at the different interaction stages
- b. partially accessible
- c. not accessible

This parameter categorises the services according to their accessibility along the accessibility chain and yields services that are either fully accessible, even if they are integrated, for instance, in a web-platform, partially accessible, or not accessible at all.

2 Degree to which the end-user is involved in the process

- a. end-user involvement in the design (HCD service)
- b. partial involvement of end-users in the design
- c. none.

This parameter yields services that involve end-users in the design of the service. Though this parameter is considered necessary in order to align with the concept of inclusion and Universal Design, it will not be further considered in this article because it exceeds its scope. However, in the field of Easy to Read, a succinct study conducted by Bernabé (2015) showed that the design of E2R digital products often follows the principles of HC Design.

This section has related access services to digital accessibility. As a result, two parameters for categorisation have been identified, one related to the compliance with the digital accessibility principles (WCAG) throughout the provision chain, and the other one related to the underlying, human-centred approach of accessible design.

Since this article focuses on cognitive accessibility, the accessibility chain should be adapted accordingly. The next section shows how the accessibility chain can consider simplification recommendations to improve comprehension.

3.1 Improving cognitive accessibility in the accessibility chain

The purpose of this article is to provide a taxonomy for easy-to-understand access services. The fact that the taxonomy considers these services as digital products explains why they should be compliant with digital accessibility principles during the interaction. After this initial, more generic step, this section shows how the guidelines Information for All (Inclusion Europe 2009), easy-to-read materials (IFLA 2010), and Annex II of the German directive *Barrierefreie Informationstechnik-Verordnung—BITV 2.0* (BITV 2016) already provide recommendations to improve readability, and, hence, understandability throughout the accessibility chain. These overlapping documents, authored by end-users associations and legislation, emphasise the need for an interdisciplinary effort to gather all views and knowledge in the process of developing these new services. According to Figure 2, the service should support cognitive accessibility at access and throughout the provision, and that the content itself should be easy to understand. The recommendations are presented following this scheme.

Easy-to-understand interaction throughout the service

Users start interacting with the system or platform at the very moment they decide to use a service. The first steps they undertake aim to locate the service, operate it, or stop the interaction if their expectations are not met at this stage. The following recommendations seek to improve the experience during the interaction by supporting cognitive accessibility.

Finding the service

Provide E2U information about:

- What contents and services are provided (e.g. DVD, web-platform).
- What contents and services are available in E2U.
- How to navigate and reach the E2U services.
- Who to contact for assistance.

If available through the Internet, add the keywords: Easy to Read, Plain Language, and Easy to understand to the meta tag.

Operating the service

- Provide E2U information about how to control the player before the actual film, play, broadcast, etc. begins.
- Present the aforementioned information automatically on the screen or display it before the actual show begins.
- Provide a way (e.g. link, menu item) to return to Home at any time.
- Provide an easy way to find the information provided in E2U.
- Provide different and predictable ways of finding content.
- Try to have a way for people to find things easily.
- If available through the Internet, avoid pop-ups.
- Audio description can be switched off at any time.
- Audio subtitles can be switched off at any time.
- Subtitles can be switched off at any time.
- Speed control and rewind are available throughout the duration of the audio description.

Understanding

- Inform the audience beforehand about the topic of the show.
- In audio descriptions, the background voice and its purpose should be introduced before the show starts.
- Choose the format (audio, written) that is best suited to its purpose; support understanding through multimodality.
- Provide E2U instructions to solve errors.
- Use E2U linguistic and design recommendations to present content.

Robust

Guarantee compatibility with other technologies such as screen-readers.

End-user participation

- Always find out as much as you can about the people who will use your information and about their needs.
- Take into account the information formats: written, electronic, audio and video.
- Always involve people with intellectual disabilities when creating your information.

3.2 Conclusions

By acknowledging E2U access service as digital products, it is possible to foster a multidisciplinary approach in their design and creation. Though digital accessibility guidelines already include access services as Success Criteria, AVT is now starting to take a more holistic view that goes beyond content creation.

This new understanding of access services will also influence the skills and competences that professionals in the field must acquire to deliver quality E2U access services. Furthermore, it will trigger the need for training and training material, and it will create new job opportunities

4 E2U audiovisual content meets validation

Plain Language and Easy to Read are user-centric simplification methods. Both recommend involving end-users in the creation process and, particularly, as validators of understandability (Inclusion Europe 2009; IFLA 2010; PLAIN 2011; García 2012; Siddharthan 2014; Plena Inclusión Madrid 2018).

Validating understandability is critical in E2R contexts and recommended for PL texts (PLAIN 2011; AENOR 2018; Plena Inclusión Madrid 2018). However, this process or task does not change the nature of access services. For instance, a validated subtitle would still be a subtitle, whether E2R, PL, E2U, intralingual or interlingual.

This article acknowledges the importance of validation as a parameter to assess quality of E2U content and suggests two variables: (a) Validation goal and (b) Point in time of validation. The first enables the categorization of E2U content according to the pursued validation goal, for example, compliance with E2R or PL rules and recommendations, text-type adequacy, or to obtain the E2R logo.

The second, Point in time of validation, locates assessment chronologically either before or after provision. From a user-centric approach, a validation that takes place before provision implies that experts or end-users have been purposefully involved in an iterative process. Conversely, a validation that is carried out after provision occurs under uncontrolled conditions. For instance, the channels are random (e.g., via social media, a feedback form, a comment on Facebook, or an email) and profile, motivation and expertise of the person remain most probably unknown. Furthermore, in this type of validation, validation results may not be implemented for reasons such as money constraints. Also, in some cases, adequacy of the proposed changes will have to be assessed prior to implementation. Due to these constraints, such validation can only be considered as “Commented validation”. As parameters, Validation goal and Validation point in time can be operationalized to differentiate the resulting categories.

Table 6. Chapter 4. E2U content validation

Validation goal	Validation point in time	
	During creation	After provision
E2R-logo validation	E2R end-user revised. Validated texts display the E2R logo (e.g. Inclusion Europe, Netzwerk Leichte Sprache) and cannot be modified afterwards without undergoing anew end-user validation	
PL validation	PL end-user revised	
Compliance with E2U rules/recommendations	<ul style="list-style-type: none"> • E2R revised • PL revised • Pictogram revised 	<ul style="list-style-type: none"> • E2R commented validation • PL commented validation • Pictogram commented validation
Non-validated	Not validated	Not validated

4.1 E2R-logo validation

Plena Inclusión Madrid (2018) and AENOR (2018) define this type of validation as a validation that is carried out by end-users. This validation focuses on the understandability of the content during the interaction. Though it also encompasses linguistic revision of the content, it approaches style and linguistic appropriateness from a cognitive perspective. The main validators are end-users, who are supported in the process by so-called facilitators. Validated texts may display the E2R logo in compliance with the issuing organisations (e.g., Netzwerk Leichte Sprache, Inclusion Europe). After validation, these texts or services may not be changed without undergoing a new validation. As for the point in time, this validation can be done during and after the text or the service have been created. However, until the validation has been completed and the logo issued, this validation will fall under one or several of the next types.

4.2 PL validation

This type of validation is equivalent to the first. However, no logo is issued because there are currently no PL logos.

4.3 Compliance with E2U rules/recommendations

This validation can be undertaken by teams of persons with disabilities and facilitators, or by other professionals in E2U simplification guidelines and recommendations. For instance, a subtitler who knows E2R guidelines can validate whether readability compliance is given with regards to paratextual features (e.g., font-size, font-type, spacing) and linguistic simplification rules.

As for the point in time, this validation can take place before or after delivery. Validation after provision takes place under uncontrolled conditions. In such cases, there is no knowledge on the validator or the validating conditions nor on the purpose of the validation.

4.4 Non-validated services

This case yield services that have not undergone validation.

5 Conclusions

E2U access services can be described as inspirational translations that use language in a non-standard way and act as text enhancers to fulfil the overall goal of supporting readability and understandability of audiovisual content. The semiotic identity of the simplification methods used to create easy-to-understand content leads to changes in semiotic identity as compared with their standard counterparts. Differences bring to light idiosyncratic properties such as the use of nonverbal elements (e.g., pictograms or emojis), paratextual features (e.g., bigger font-sizes, use of the white space on the page), and prosodic ones (e.g., intonation and use of voice in audio access services). Having their own defined identity may facilitate their integration in the AVT landscape and increase their visibility.

Above all, the suggested classification should be regarded as a starting point to gather empirical data from reception studies and foster their development. Furthermore, the classification will enable the development of parameters for each service as already undertaken in the field of E2U audio description (Bernabé & Orero 2019), E2U subtitling (Bernabé et al. forthcoming), and E2U respeaking (Eugeni & Bernabé 2020).

The categorisation of E2U access services has also brought into light two further aspects: the role of validation and validators, and the need for access services that consider accessibility throughout the whole accessibility chain. The fact that understandability can only be validated by end-users also fosters the recognition of this professional role and creates new job opportunities. The compliance of digital E2U access services with the WCAG 2.1 guidelines will not only enable access for all, but it will also support the current work of the COGA.

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Chapter 5. Article 4. Identifying parameters for creating Easy to Read subtitles

Summary

This article revolves around the underlying premise that easy-to-understand subtitles can enhance the cognitive accessibility of audiovisual content. Furthermore, it contends that authors can tackle the need for guidelines by borrowing parameters from well-established reference documents. The documents selected for the case study were the Spanish standard on Subtitling for the Deaf and Hard-of-Hearing, and the Easy to Read guidelines published by Inclusion Europe. The article uses the framework for hybridisation developed in this PhD thesis in the case in point of subtitling. The paper is divided into three sections. The first concerns methodology and explains in detail the hybridisation steps. The second focuses on describing the validation process developed by Plena Inclusión Madrid and how it was adjusted for the study, while the third reports on the validation results. As in the articles before, the last section summarises the conclusions reached.

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Identifying parameters for creating Easy to Read subtitles³⁴

Abstract

Access services that provide audiences with cognitively accessible audiovisual content are less studied than those which target sensory barriers (e.g., intralingual subtitles, audio descriptions). One factor that limits said development is the lack of evidence-based parameters for production. This exploratory study aims to tackle the need to establish parameters for Easy to Read subtitles by comparing the Easy to Read (E2R) guidelines by Inclusion Europe and the Spanish standard for subtitling for the Deaf and Hard-of-Hearing (SDH). The comparison yielded a set of 16 parameters for production that are mentioned in both guidelines as well as 3 parameters that emerged from the E2R guidelines.

Keywords: cognitive accessibility, easy access services, easy-to-read audiovisual content, Easy to Read subtitles.

³⁴ The authors would like to thank Pilar Orero. This work has been carried out within the framework of the Doctoral Programme of the Autonomous University of Barcelona.

1 Introduction

Access services such as audio descriptions and intralingual subtitles provide accessible audiovisual content to audiences with sensory disabilities (ORERO 2004; MATAMALA and ORERO 2013; GRECO 2016). The applied branch of Translation Studies demands that translators use evidence-based tools for creation (RABADÁN 2010; TOURY 1995, 2012). An example of such, taken from the field of subtitling for the Deaf and Hard-of-Hearing (SDH), is that of the guidelines proposed by NEVES (2005) in her descriptive research. The parameters studied with eye-tracking technology by ARNÁIZ-UZQUIZA (2012b) also fall into this category, as do the quantitative and qualitative data about viewers' preferences provided by ROMERO-FRESCO (2015) in the volume dedicated to the quality of subtitles. Lastly, another evidence-based tool is the Spanish Standard for SDH, UNE 153010:2012, (AENOR 2012).

The lack of empirically-based tools for producing Easy to Read subtitles requires that translators resort to experience-based ones, such as the guidelines published by Inclusion Europe in 2009. Entitled *Information for All*, the guidelines are an output from the European projects Pathways, which aimed to foster life-long learning for people with intellectual disabilities. The resulting European guidelines are in English with translations into 15 other languages, and are available at <https://easy-to-read.eu/european-standards/>.

This exploratory research draws upon the proposal by BERNABÉ and ORERO (2019) that 'easy'³⁵ access services can be developed by merging guidelines from the world of Audiovisual Translation and Easy to Read. The aim is to describe to what extent Easy to Read and SDH parameters overlap and can interbreed. Though such "marriage(s) of convenience" (MATAMALA and ORERO 2013: 1) already exist, there are also constraints as identified by scholars in the fields of interlingual and intralingual real-time subtitles (DÍAZ CINTAS and REMAEL 2007; EUGENI 2008; ROMERO-FRESCO 2009; SZARKOWSKA 2013). The authors point out that each modality needs its own applied parameters to be able to satisfy the needs of a targeted audience within specific contexts.

The next section describes the compared documents and the methodology followed.

³⁵ Derived from the use of Easy to Read.

2 Methodology

The structure set out in this study is based on a two-stage workflow to produce E2R subtitles as proposed by the authors. The first stage focuses on creation by using parameters that consider end-users' needs, while the second focuses on validation by involving end-users as recommended by scholars and current professional practice in E2R (SHARDLOW 2014; SAGGION 2017; PLENA INCLUSIÓN MADRID 2018; INCLUSION EUROPE 2009; IFLA 2010). The figure below illustrates the two stages.

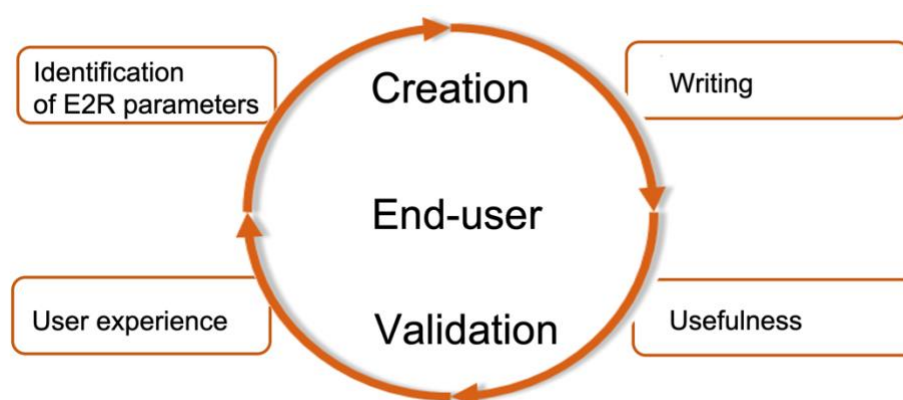


Figure 1. Chapter 5. User-centric workflow for producing E2R subtitles

This study focused on the first stage and, more specifically, on the identification of subtitling parameters. The next sections provide an overview of the identified parameters as well as recommendations from the comparison of the Easy to Read guidelines *Information for All* and the Spanish standard for Subtitling for the Deaf and Hard-of-Hearing.

3 Results

The order of comparison followed the classification used in the Spanish SDH standard (UNE 153010:2012):

- visual (section 4)
- temporal (section 5)
- speaker identification (section 6)
- sounds effects (section 7)
- contextual information and off-screen voice (section 8)
- music and songs (section 9)
- editorial criteria (section 10)

For each section, comparison data revealed parameters and recommendations that were:

- **shared**, which expressed shared recommendations by E2R and SDH,
- **non-shared**, which brought to light contrary recommendations,
- **only E2R**, which derive from E2R and are not included in the SDH standard, and
- **only SDH**, which lack a corresponding E2R recommendation.

The comparison yielded a total of 53 parameters: 16 were found in both documents, while 34 were exclusively in the SDH standard and only 3 in the Easy to Read guidelines. Table 1 provides an overview of the distribution.

Table 1. Chapter 5. Overview of the results

Section	Parameters in both documents:		Parameters in one document		Total
	shared recommendations	non-shared recommendations	SDH	E2R	
Visual	6	-.	4	3	12
Temporal	1	1	1		3
Speaker identification	1	-.	8	-.	9
Sounds effects	-.	-.	7	-.	7
Contextual information	-.	-.	6	-.	6
Music and songs	-.		5	-.	5
Editorial criteria	4	3	3	-.	10
Total	12	4	34	3	53

The overview shows that 18 parameters are found in both documents, which accounts for a 34,5% overlap. However, a closer look reveals that only 20% of the recommendations are shared. The following sections present the results ordered by section.

3.1 Visual presentation

Section 4 of the SDH standard includes parameters regarding how subtitles should be presented visually on-screen. A total of 13 parameters were identified: 10 from the SDH standard and 3 from the E2R guidelines. Out of the 10 parameters from the SDH standard, 6 are also found in the E2R guidelines.

Table 2. Chapter 5. Comparison of visual aspects

ID	Parameter	SDH recommendation	E2R recommendation
1.	On-screen placement: all subtitles except sound information	<ul style="list-style-type: none"> • Centred • Lower bottom of the screen, except if relevant information is covered. 	<ul style="list-style-type: none"> • Bottom of the screen • Subtitles should be in the same position on the screen throughout the whole video.
2.	On-screen placement: sound information	Whenever possible: on the upper righthand corner of the screen	-.-
3.	Number of subtitling lines	<ul style="list-style-type: none"> • Maximum two lines • In exceptional cases, three lines 	Try not to use too many layers of subtitles
4.	Static text lines	Static	-.-
5.	Line per speaker	New line per speaker	-.-
6.	Sentences per line		Always start a new sentence on a new line.
7.	Characters per line	Maximum 37 characters per line	-.-
8.	Minimum font size	Legible according to the size of the screen	<ul style="list-style-type: none"> • Check that you can also read them on a small screen. • Always use large writing. You should use writing which is at least the size of Arial 14.
9.	Maximum font size	The maximum size should allow for the display of a 37-character subtitle	Subtitles should be easy to read. For example, use larger writing than usual writing in a movie subtitle.
10.	Font-type	Use a font-type with the greatest legibility	<ul style="list-style-type: none"> • Try to use only 1 type of writing in your text. • Never use a special writing design. • Never use serif fonts. • Never use writing that is too close together.
11.	Contrast: box and text	4.5 minimum	<ul style="list-style-type: none"> • There must be a strong contrast between subtitles and the background. This can be difficult because the background of a video is changing. One way is to have a dark line at the bottom on which the subtitles appear. But this line should be transparent so you can still see the film. • If there is not enough contrast between the background and the subtitles, change the font colour, not

ID	Parameter	SDH recommendation	E2R recommendation
			the position.
12.	Text alignment	-.-	<ul style="list-style-type: none"> • Align your text to the left of the page. • Never justify your text.
13.	Customisation options: (Personalisation)	-.-	It should be possible for the viewer to hide the subtitles at any time.

The six parameters found in both document recommendations regard on-screen placement, number of subtitling lines, minimum and maximum font size, font type, and contrast. Concerning on-screen placement, recommendations agree on a lower-bottom position, which should be maintained throughout the show. The SDH standard specifically advises to use a centred position and to change it only if a subtitle line is covering relevant information. As for the number of subtitle lines, E2R advises not to use too many layers of subtitles, while SDH sets a limit of 2 lines or a maximum of 3, to be used in exceptional cases.

With regards to font-type and contrast, the reviewed documents recommend fonts that support legibility. E2R recommendations are specific and warn about the use of special designs, different font-types and sans-serif or condensed fonts. Both recommendations also concord on the need for good contrast. While SDH refers to the 4.5 minimum as recommended by WCAG guidelines (W3C 2016), E2R provides guidelines for implementation.

With regards to font-size, the recommendations agree that subtitles should adapt to the size of the screen. However, a closer look shows that E2R recommends using a large font of at least Arial 14 and larger than usual writing in movie subtitles. The fulfilment of this requirement may contradict the abovementioned recommendation of avoiding many layers of subtitles.

The four parameters classified as Only SDH were: on-screen placement of sound information; static lines; line per speaker; and (d) characters per line. The absence of E2R recommendations may be grounded on the fact that E2R guidelines have been less studied in audiovisual contexts as already mentioned above.

Lastly, comparison brought to light three parameters deriving from E2R: (a) 'Customisation', (b) 'Text alignment' and (c) 'Sentences per line'. As for the first, E2R recommendations outline the need for personalisation of the service and ask for customisable subtitles that can be turned off/on at any time during viewing.

The parameter ‘Text alignment’ calls for left-alignment to support readability and states to never justify texts. While this recommendation is not included in the Spanish standard, empirical data collected by ARNÁIZ (2012b) showed that reading speed of all groups, and especially of SDH participants, was greater with left-aligned texts as compared to centred texts. Lastly, the E2R recommendation ‘New line per sentence’ is partially shared with other SDH recommendations concerning how to present utterances from dialogues (KARAMITROGLOU 1998; BBC 2019).

3.2 Presentation of subtitles: temporal aspects

Section 5 of the SDH standard includes three parameters pertaining to time-based aspects of the temporal display of subtitles. These are on-screen time of subtitles, synchrony, and latency in the case of real-time subtitling. The comparison yielded a total of 3 parameters: 2 found in both documents, 1 new parameter from E2R, and 1 mentioned exclusively in the SDH standard. Table 3 shows the results.

Table 3. Chapter 5. Temporal aspects

ID	Parameter	SDH recommendation	E2R recommendation
14.	On-screen time	<ul style="list-style-type: none"> • Follows the rhythm of the source • Supports reading • Usually 15 characters per second (cps). 	Viewers should have enough time to read the subtitles.
15.	Synchrony	Subtitles should match lip movements, cuts, speech, and sound information	Subtitles should be on the screen as long as possible.
16.	Latency in real-time subtitling	<ul style="list-style-type: none"> • As little as possible • Less than 8 seconds is recommended 	-.-

Temporal aspects are closely related to how a person reads and how she/he performs in terms of comprehension. SDH research in this field is extensive and has evidence-based rules such as the use of 35-37 characters per line and on-screen times from 1 to 6 seconds (DÍAZ CINTAS 2003, ROMERO-FRESCO 2010, ARNÁIZ-UZQUIZA 2012a).

Comparative data show that the E2R recommendations are vague in this regard, which points to a lack of knowledge about how persons with reading difficulties read subtitles and how they perform in terms of comprehension. SHANAHAN (2019: 1) explains that the study of habits and skills in struggling readers should take into consideration key factors beyond speed rates such as the ability "to decode easily and continuously and to maintain their concentration" during reading.

Lastly, recommendations seem to disagree with regards to synchrony. While SDH advocates for synchrony with the spoken word, E2R advises that subtitles should be on screen as long as possible, which could affect synchrony and rhythm as defined in SDH.

3.3 Parameters for speaker identification

Section 6 of the standard includes nine parameters regarding how to identify speakers on and off the screen. The comparison did not yield any parameters from E2R. While three parameters were found to overlap, only one recommendation was shared.

Table 4. Chapter 5. Speaker identification

ID	Parameter	SDH recommendation	E2R recommendation
17.	Technique	Recommended techniques by order of priority: <ul style="list-style-type: none"> • Colours • Labels • Dashes 	-.-
18.	Colours: changes in colour assignation	None, unless the plot requires it.	-.-
19.	Colours: difference between colours	Minimum value: 255	-.-
20.	Labels: use of labels for speaker identification	Use only to support clarity and when the use of colours is not possible or does not support clarity.	-.-
21.	Labels: position	Labels should precede the subtitle.	-.-
22.	Labels: editing	<ul style="list-style-type: none"> • Labels should: <ul style="list-style-type: none"> • include the name of the speaker, a shortcut, or an objective characteristic of the speaker • use capital letters • use brackets 	-.-
23.	Labels: use of abbreviations	Abbreviation may be used in the labels to identify characters.	-.-
24.	Dashes: use in dialogs	Use only to support clarity when the other two techniques, colours and labels, cannot be used.	-.-
25.	Off-screen voice: speaker identification	Use the same technique as that used for speaker identification.	<ul style="list-style-type: none"> • A background voice should only be speaking about things that people can see on the screen. • If you use a background voice, it can be helpful to

ID	Parameter	SDH recommendation	E2R recommendation
			present the person first before he or she starts talking in the background.

The comparison shows that both documents agree on the need for a parameter to signal a voice speaking in the background (ID 25: Off-screen voice). However, the underlying motivations differ. While SDH recommendations focus on providing a visual mark for a voice in off, E2R focuses on providing viewers with information about what a background voice is and what type of information a background voice should provide.

Lastly, SDH recommendations in this section advise to use colours and abbreviations for identification purposes, neither of which are recommended in the E2R guidelines used in this study. However, validation practice in E2R has shown that the use of colours in headings and sub-headings supports E2R readers (REAL PATRONATO SOBRE LA DISCAPACIDAD 2015). The Spanish standard on Easy to Read (UNE 153101 EX) also supports this view and includes the use of colour as a technique to visually separate headings from the content in section 7.1.

3.4 Sound effects

Section 7 of the SDH standard lists seven parameters pertaining to the description of sound effects in subtitles. The comparison did not yield parameters arising from the E2R guidelines. Table 5 show that the E2R guidelines do not consider such parameters and only general recommendations may be linked to them.

Table 5. Chapter 5. Sound effects

ID	Parameter	SDH recommendation	E2R recommendation
26.	Recorded subtitles: description of sound effects	Describe sound effects in the subtitles if it is necessary to follow the plot.	<ul style="list-style-type: none"> • Always make sure you give people all the information they need. • Do not give people more information than they need to understand your point. • Only give them the important information.
27.	Real-time and semi-recorded subtitles: description of sound effects	If possible, use subtitles for describing sound effects.	<ul style="list-style-type: none"> • Always make sure you give people all the information they need. • Do not give people more information than they need

ID	Parameter	SDH recommendation	E2R recommendation
			to understand your point. • Only give them the important information.
28.	Rhythm and synchrony of sound effects	Adjust subtitles to the rhythm of sound and keep synchrony in order to convey the same message as that in the sound information.	-.-
29.	Format:	<ul style="list-style-type: none"> • Place the information in brackets. • Use capitals for the first letter. 	-.-
30.	Avoid redundancy	When the information is also conveyed visually, the sound effect should not be described.	-.-
31.	Nominalisation	Uses nominalisation to describe sound effects.	-.-
32.	Information conveyed	The subtitle should describe the source of the sound.	-.-

These results tend to segue into a discussion about whether rendering this type of information is necessary; if it supports understanding or on the contrary it leads to overload. The only references found in the E2R guidelines are general and warn about the risks of providing too much or too little information: "Do not give people more information than they need to understand your point", "Always make sure you give people all the information they need", and "Only give them the important information" (INCLUSION EUROPE 2009: 17).

3.5 Contextual information and off-screen voice

Section 8 of the SDH standard includes six parameters. Contextual information is provided in SDH subtitles in order to render non-verbal elements conveying linguistic and paralinguistic information. Non-verbal linguistic information is part of the linguistic information communicated in a situation and includes, for instance, pitch, accent, and intonation. In turn, non-verbal paralinguistic information refers, for instance, to speakers' attitudes and emotions (LLISTERRI 2019).

The comparison shows that the E2R guidelines do not consider these parameters. As in the previous section, only general recommendations apply.

Table 6. Chapter 5. Contextual information and background voice effects

ID	Parameter	SDH recommendation	E2R recommendation
33.	Pre-recorded subtitles	Provide subtitles with contextual information ³⁶ .	<ul style="list-style-type: none"> • Always make sure you give people all the information they need. • Do not give people more information than they need to understand your point. • Only give them the important information.
34.	Real-time and semi-recorded subtitles	Provide subtitles with contextual information, where possible.	<ul style="list-style-type: none"> • Always make sure you give people all the information they need. • Do not give people more information than they need to understand your point. • Only give them the important information.
35.	Format	<ul style="list-style-type: none"> • Use brackets to display contextual information. • Use capitals for all letters. 	--
36.	Position	Place contextual information before the subtitled information.	--
37.	Synchrony	Words and subtitles should be synchronous	--
38.	Off-screen voice	Use italics, if possible	--

The E2R guidelines do not mention parameters to convey contextual information. Only general E2R recommendations seem to apply, which outline the need to explore what information needs to be made explicit, when, and how.

The use of capital letters and italics (ID 35 and 38) are not shared by the E2R recommendations, which warn specifically about their use.

3.6 Music and songs

Section 9 of the SDH standard lists five parameters regarding how to subtitle music and songs. As in sections 7 and 8, Sound effects and Contextual information, no parameters were found in the E2R guidelines.

³⁶ Example: (IRONICALLY) How nice he is.

Table 7. Chapter 5. Music and songs

ID	Parameter	SDH recommendation	E2R recommendation
39.	Music	<ul style="list-style-type: none"> • Provide subtitles when it is relevant for understanding the plot. • Provide at least one of these topics: <ul style="list-style-type: none"> ○ type of music ○ sensation/feeling conveyed ○ identification data (author, title, etc.) 	<ul style="list-style-type: none"> • Always make sure you give people all the information they need. • Do not give people more information than they need to understand your point. • Only give them the important information.
40.	Format	Follow the format of the sound provided	-.-
41.	Songs	Provide subtitles when it is relevant for understanding the plot.	<ul style="list-style-type: none"> • Always make sure you give people all the information they need. • Do not give people more information than they need to understand your point. • Only give them the important information.
42.	Songs: tagging	<ul style="list-style-type: none"> • Begin each subtitle with the note symbol or a hashtag. • Add another note symbol or a hashtag to the end of the last subtitle 	-.-
43.	Songs: singer identification	Use the same technique as for character identification	-.-

As in the previous sections, only E2R recommendations may apply. In addition, in this section the recommended use of special characters to tag songs (ID 43) goes against the E2R guidelines, which warn about the use of special characters.

3.7 Editorial criteria

Section 10 of the SDH standard covers ten parameters concerning language usage, grammar, punctuation, and style guidelines. The comparison shows that seven parameters overlap, but that recommendations are not always shared.

Table 8. Chapter 5. Editorial criteria

ID	Parameter	SDH recommendation	E2R recommendation
44.	Line breaks	<ul style="list-style-type: none"> • Use narrative pauses and silence. • Use grammatical pauses and punctuation. • Write conjunctions and nexus in the bottom line. • Do not separate verbal, nominal or prepositional syntagma. 	<ul style="list-style-type: none"> • If you have to write 1 sentence on 2 lines, cut the sentence where people would pause when reading out loud. • Where possible, 1 sentence should fit on 1 line. • Always start a new sentence on a new line.
45.	Hyphenation	Do not use hyphenation.	Never split 1 word over 2 lines. This means never use a hyphen (-).
46.	Suspension points	<ul style="list-style-type: none"> • Do not use to divide one sentence in two different subtitles. • Use suspension points according to the grammatical rules. 	<ul style="list-style-type: none"> • Avoid all special characters where possible.
47.	Grammatical rules and punctuation	Follow grammatical and punctuation rules.	Keep the punctuation simple.
48.	Official language	Follow the applicable criteria.	-.-
49.	Speakers and speech	Use correct grammar and spelling unless they are used to convey information which is necessary to understand the plot.	Do not use dialects.
50.	Abbreviations and symbols	Write out abbreviations and symbols that cannot be transcribed in the subtitle.	<ul style="list-style-type: none"> • Avoid abbreviations • Avoid all special characters where possible.
51.	Numbering	<ul style="list-style-type: none"> • Write out numbers from one to ten. • Do not write numbers accompanying abbreviations, signs, or symbols. • Do not write out dates, hours, negative numbers or decimals. 	<ul style="list-style-type: none"> • Write numbers as digits, not as words. • Never use Roman numerals. • Where possible, write dates out in full.
52.	Verbatim	Use verbatim subtitles where possible	-.-
53.	Real-time subtitles	Try to reach the highest accuracy possible.	-.-

The reviewed documents share a high number of editorial parameters. With regards to E2R, its recommendations are specific enough for creation and validation. Furthermore, the comparison identified a lack of parameters and recommendations for real-time contexts.

3.8 Parameters for Easy to Read subtitles

The table presents the 16 shared parameters and the 3 from the E2R guidelines. Only the E2R recommendations have been included. This table is for informative purposes only.

Table 9. Chapter 5. Overview of shared parameters

Visual aspects		
1.	On-screen placement: all subtitles except sound information	<ul style="list-style-type: none"> • Lower bottom of the screen, except if they cover relevant information. • Subtitles should be in the same position on the screen throughout the whole video.
2.	Number of subtitling lines	Try not to use too many layers of subtitles.
3.	Sentences per line	Always start a new sentence on a new line.
4.	Minimum font size	Legible according to the size of the screen <ul style="list-style-type: none"> • Check that you can also read them on a small screen. • Always use large writing. You should use writing which is at least the size of Arial 14.
5.	Maximum font size	Subtitles should be easy to read. For example, use larger than usual writing in movie subtitles.
6.	Font type	Use a font-type with the greatest legibility <ul style="list-style-type: none"> • Try to use only 1 type of writing in your text. • Never use a special writing design. • Never use serif fonts. • Never use writing that is too close together.
7.	Contrast: box and text	<ul style="list-style-type: none"> • There must be a strong contrast between subtitles and the background: One way is to have a dark line at the bottom on which the subtitles appear. But this line should be transparent so you can still see the film. • If there is not enough contrast between the background and the subtitles, change the font colour, not the position.
8.	Text alignment	<ul style="list-style-type: none"> • Align your text to the left. • Never justify your text.
9.	Customisation options: (Personalisation)	It should be possible for the viewer to hide the subtitles at any time.
Temporal aspects		
10.	On-screen time	Viewers should have enough time to read the subtitles.
11.	Synchrony	Subtitles should be on the screen as long as possible.
Speaker identification		
12.	Off-screen voice: speaker identification	<ul style="list-style-type: none"> • A background voice should only be speaking about things that people can see on the screen. • If you use a background voice, it can be helpful to present the person first before he or she starts talking in the background.

Editorial criteria		
13.	Line breaks	<ul style="list-style-type: none"> • If you have to write 1 sentence on 2 lines, cut the sentence where people would pause when reading out loud. • Where possible, 1 sentence should fit on 1 line.
14.	Hyphenation	Never split 1 word over 2 lines. This means never use a hyphen (-).
15.	Suspension points	<ul style="list-style-type: none"> • Avoid all special characters where possible.
16.	Grammatical rules and punctuation	Keep the punctuation simple.
17.	Speakers and speech	<ul style="list-style-type: none"> • Use correct grammar and spelling unless they are used to convey information which is necessary to understand the plot. • Do not use dialects.
18.	Abbreviations and symbols	<ul style="list-style-type: none"> • Avoid abbreviations • Avoid all special characters where possible.
19.	Numbering	<ul style="list-style-type: none"> • Write numbers as digits, not as words. • Never use Roman numerals. • Where possible, write dates out in full.

4 Conclusions

The comparison has shown that the reviewed documents refer to similar parameters with regards to visual and temporal aspects, editorial criteria, and speaker identification. The classification of the parameters also brought to light that the E2R guidelines report less on how to convey music, sound, and contextual information. In addition, specific E2R parameters were found.

Overall, the outcome supports the initial statement that access services can benefit from knowledge from related services but will still inevitably retain their own characteristics. This is evident especially when comparing specific recommendations. While the reviewed guidelines often agree about the type of parameter, the exact recommendations within differ so as to meet the needs of the targeted audience, in this case, persons with reading and learning difficulties.

The study has also highlighted the need for further research in order to clarify several remaining problem areas. One of these is, for instance, to what extent the need for bigger fonts may lead to more than two subtitling lines. Regarding sound, music and contextual information, it would be useful to study how redundant information is received by E2R audiences, who usually perceive information iso-semiotically, meaning through the same channels as the original.

With regards to synchrony with images, there is a need to understand to what extent the E2R recommendation "Subtitles should be on the screen as long as possible" differs from current subtitling practices. Another unresolved question concerns reading speeds. Additionally, E2R editorial recommendations for written documents such as avoiding italics, writing out numbers and dates and avoiding special characters and colours should be explicitly studied for subtitles.

Lastly, the E2R recommendation to "Always make sure you give people all the information they need" brings up the question as to whether E2R subtitles and access service should have a more informative function. One example is the recommendation [...] "to present the background voice before they start talking on the background".

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Chapter 6. Article 5. Validation of Easy-to-read Subtitles

Summary

This article revolves around validation of Easy to Read subtitles by end-users with intellectual disabilities. The methodology for validation was based on the workflow defined by Plena Inclusión Madrid for E2R written content. Firstly, the article explains the validation scheme and process in Easy to Read written contexts, and illustrates the adaptation used for validating E2R subtitles in the case study. Subsequently, the tool for data collection is presented, followed by a thorough description of the set-up of the focus groups and the participants. Lastly, the results are presented. The article includes a final section summarising the conclusions drawn.

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Abstract

Translators rely on software and online tools every day. The use of technology in the profession has also spread to education, where computer-aided and automatic translation or terminology-management tools are anchored in curricula. Despite the extended functionality of technological aids, specific tasks must be performed by humans. An example is the assessment of how understandable a text is by target readers. While this applies to all texts and audiences, it is particularly necessary for easy-to-read content. This small-scale case study concerns the reception of easy-to-read subtitles created for a 360° opera experience within the project Immersive Accessibility. The aim was to assess their usefulness through end-user validation. The validation scheme used was the 5-stage procedure proposed by Plena Inclusión Madrid for written texts, which was slightly adapted to the audiovisual format of the stimuli. Results show that easy-to-read subtitles can help viewers with cognitive needs to understand audiovisual content.

Keywords: cognitive accessibility, easy access services, easy-to-read audiovisual content, easy-to-understand access services, subtitles, intellectual disabilities

1 Introduction

Digital content and audiovisual media have become key enablers for communication, education, and full participation in our knowledge society. This development has triggered the need for accessible products or services that can be used by the broadest range of audiences in order to avoid exclusion (United Nations, 2008; European Commission, 2010; European Parliament, 2016).

Access services such as interlingual subtitles, subtitles for the Deaf and Hard-of-Hearing (SDH), or audio descriptions provide users of audiovisual products with access to content through different sensory channels than the original. However, the availability of services that provide access to content for persons who experience difficulties in the process of meaning-making is still limited (Bernabé & Orero, 2019).

These audiences are heterogeneous and include persons with different cognitive needs and abilities in terms of reading, writing and understanding. For instance: persons with low literacy, reading or learning difficulties; persons with intellectual disabilities; and those with temporary impairments or limited language skills (e.g., second-language learners, immigrants, and displaced populations). Finally, the elderly also can fall into this category as a population which is affected by measurable cognitive loss upon ageing (Murman, 2015).

Statistics from international organisations can help to better understand the scope of the situation. In 2017, the UNESCO Institute for Statistics reported that 750 million adults are either illiterate or have low literacy (UNESCO Institute for Statistics, 2017). Amongst them, persons with disabilities, who make up 15% of the world population, were identified to be at greater risk for low literacy (UNESCO Institute for Statistics, 2018). Persons with intellectual disabilities, 75 to 225 million people (Special Olympics, 2016), comprise approximately 1-3% of the global population, which was recorded at 7.6 billion people in 2018.³⁷

Regarding persons aged 60 and over, estimates show that this segment of the population will reach 2 billion worldwide by 2050 (World Health Organisation, 2018). Lastly, migrants, as persons who face communication barriers especially upon arrival in a host country, accounted for 144,166 arrivals of non-EU citizens to Europe in 2018, as reported by the International Organization of Migration (IOM) in the fourth quarter (IOM, 2019).

³⁷ World Bank Group: population, total: <https://data.worldbank.org/indicator/sp.pop.totl>

Easy to Read (E2R) is a text simplification method that uses guidelines and recommendations to improve readability features of written texts and their ability to be understood by persons with reading or learning difficulties (Inclusion Europe, 2009; IFLA, 2010; Saggion, 2017). In audiovisual contexts, however, its use has been limited. Indeed, it was not until 2019 that Bernabé and Orero (2019) categorised it within Media Accessibility as a multimode accessibility service that allows for the production of easy-to-read audiovisual content. This study used this definition of Easy to Read as a starting point.

The next sections report on the end-user validation of subtitles that were created using parameters and recommendations from the E2R guidelines *Information for All. European standards for making information easy to read and understand* published by Inclusion Europe and the Spanish standard on subtitling for the Deaf and Hard-of-Hearing. Furthermore, it proposes a validation scheme for E2R audiovisual products.

2 End-user validation of Easy to Read content

Validation, as a part of the publication process of E2R texts, has a short list of references. In 2009, the guide *Do not write for us without us – Involving people with intellectual disabilities in the writing of texts that are easy to read and understand*, published by the project Pathways, provided several guidelines to develop this so-called validation. In 2010, the International Federation of Library Associations (IFLA) updated its 1997 *Guidelines for Easy-to-Read materials* and stated: ‘Test the material with actual target groups before it goes to press’ (2010: 11). However, it failed to explain the process.

In 2018, the Spanish standard UNE 153101 EX concerning Easy to Read officially described validation as part of the process and defined it as a ‘guided procedure to assess comprehension of an Easy to Read document, which has to be performed by target users.’ (AENOR, 2018: 6). Finally, in the same year, Plena Inclusión Madrid published the handbook *Validación de textos en lectura fácil: Aspectos prácticos y socio-laborales*, which includes detailed descriptions of the validation concept, roles, and process, and provides strategies for working with people with intellectual disabilities.

With regards to the specific roles, the handbook and the Spanish standard agree on two: validators and facilitators. Validators are ‘persons with reading comprehension difficulties who are trained in E2R guidelines. Their work is to check that E2R texts comply with the guidelines and are understandable for other people with reading or comprehension difficulties’ (Plena Inclusión Madrid, 2018: 15). Facilitators are defined as ‘professionals who are members of a validation team but have no influence in validators’ opinions’

(ibid 2018: 17). Their role is to set up the team, organise validation sessions, promote participation, and act as a contact person between the adaptor and the validation team. The definitions show that the roles are detached: while validators take the leading role in the assessment of the content, facilitators support the process.

Plena Inclusión Madrid (2018: 18) suggests validation groups of 4 to 6 people and specifies that a group 'must include persons with varied reading skills and comprehension degrees to avoid biases'. As far as the sessions are concerned, they should last 1 to 2 hours and take place in the same room, where possible. Figure 1 illustrates the 5-stage process proposed by Plena Inclusión Madrid:

- Stage 1: a facilitator prepares a text and sets up a room for the validation sessions. Validators receive a general explanation of the intended text.
- Stage 2: validators read the text to identify comprehension difficulties.
- Stage 3: validators read the text out loud and comment together on the detected difficulties.
- Stage 4: validators suggest solutions for each comprehension difficulty, which have to be accepted by the whole group.
- Stage 5: validators re-read the text with the proposed solutions.

The process is iterative and repeated until consensual solutions have been approved by validators.

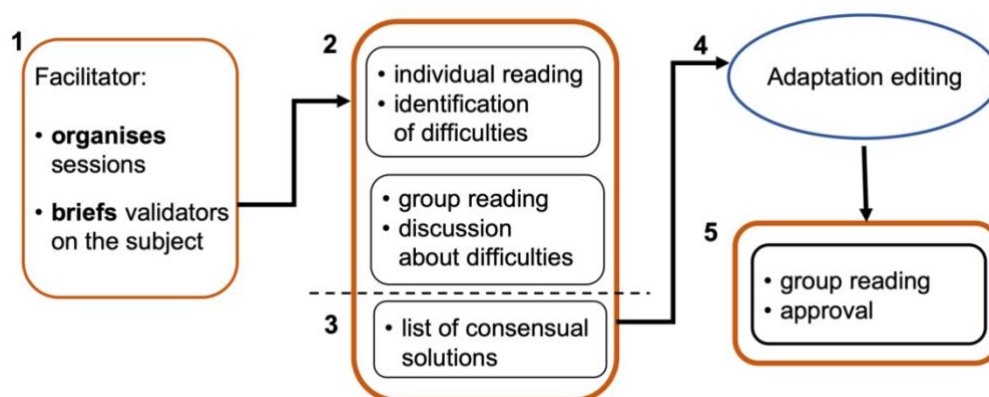


Figure 1. Chapter 6. Validation tasks for written texts

Though this scheme concerns written texts, it is not bound to this format (written). This was shown in the validation conducted within the pilot project Teatro Accessible³⁸ (Accessible Theatre), which used audiovisual material. In this case, a pre-recorded play and surtitles were presented to validators in the original form together with an additional E2R audio description line, which had been integrated into their assistive devices.

The present study attempts a similar experiment in the case of subtitles. To do so, stages 1, 2 and 5 were adapted to the audiovisual format, while 3 and 4 remained as defined for monomodal written formats.

- In Stage 1, computers or projectors were used for viewing, and briefing was more extensive, as the genre, as well as the opera *Romeo and Juliet*³⁹, were unknown to validators;
- In Stage 2, individual reading was replaced by group viewing or individual viewing on a computer, and the identification of difficulties was oral;
- In Stage 5, final validation included one last viewing.

Figure 2 illustrates the adapted scheme.

³⁸ Accesibilidad Cognitiva en las artes escénicas. Experiencia piloto en el marco del proyecto Teatro Accesible. (<http://www.cesya.es/amadis2016/programa>). Congreso Amadis 2016, Toledo (Spain).

³⁹ *Roméo and Juliette* played at the Gran Teatre del Liceu during the 2017/2018 season.

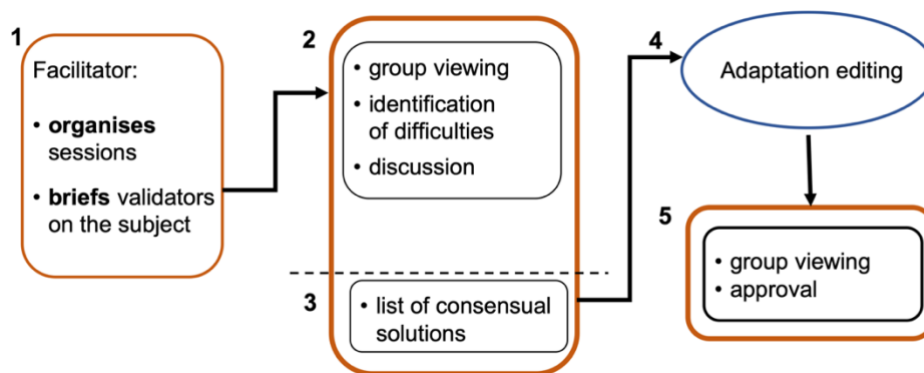


Figure 2. Chapter 6. Validation tasks for subtitles

3 Experiment

The study aimed to explore the effectiveness of a set of non-editorial and editorial subtitling features. To this end, users were asked to describe their viewing experience in terms of ‘usefulness’ (Rabadán, 2010: 10) — namely, the extent to which subtitles helped them understand the content — and enjoyment.

A total of 75 subtitles were created according to parameters and recommendations, which had been established in a previous study comparing the guidelines *Information for all* by Inclusion Europe and the Spanish standard for subtitling for the Deaf and Hard-of-Hearing (Bernabé & García, 2019).

Validation comprised two phases. First, a preliminary validation sought to gain general feedback about how persons with cognitive needs receive SDH subtitles. Then, the E2R subtitles themselves were validated. A total of three validation groups participated. The groups APROCOR and ALAS assessed the original SDH subtitles created for the ImAc project. The same ALAS group as well as a new group, APAMA, took over the task of validating the E2R subtitles. In both cases, the same questionnaire was used.

3.1 Data collection: validation SDH and E2R

The questionnaire included multiple-choice questions and free-text boxes. All data were anonymised so as to comply with European regulations on data protection and to select the relevant sociological data for this research.

The questionnaire was divided into three sections. The first two gathered data on non-editorial and editorial features⁴⁰. As for the third, it concerned participants' previous experience with subtitles and opera, their opinions about the overall validation experience, and the usefulness in terms of global comprehension. The last element of the questionnaire was a free-text box for final comments.

Non-editorial features pertained to the encoding of the subtitles during the first interaction and included visual and temporal aspects, speaker identification, and contextual information. Aspects concerning sounds and music were excluded due to the type of genre. The scales used were nominal so as to enable the creation of artificial categories suitable for each aspect (Brown, 2011: 10):

- Font size was assessed to gain insight into users' preferences for a feature that affects others directly: namely, the minimum/maximum font size and number of characters per line. To this end, a 4-item Likert scale was used: a) adequate, b) too large, c) too small, or d) not relevant.
- The use of colour for speaker identification should shed some light onto the usefulness of this parameter in E2R contexts. Validators used a 3-item Likert scale to describe whether the use of different colours a) facilitates, b) does not facilitate or c) hinders understanding.
- On-screen time assessed whether subtitles remained on-screen long enough. The four possible answers were: a) on-screen time is adequate for all subtitles, b) on-screen time is adequate but with exceptions, please specify, c) on-screen time of some subtitles is too short, please specify, d) other.
- Length of subtitle lines was validated using a 4-item Likert scale that included: a) adequate, b) adequate, except for, c) too short or d) other. Validation of the on-screen times and the length of the subtitling lines should deliver a rough idea of whether the on-screen times used for SDH audiences are acceptable for E2R audiences. Though these parameters could not be adequately measured because validation involved continuously pausing the video recording to discuss comprehension, authors included them so as to obtain a general idea about whether SDH practices may be a reference point for E2R subtitles.
- Contextual information was validated using a 2-item scale. Feedback should clarify whether it can also be useful for persons without cognitive needs.

⁴⁰ Text organisation was excluded from validation since the original audiovisual content could not be manipulated.

A total of four editorial features were validated. The aim was to grasp the extent to which lexis, expressions, punctuation, and syntax may support or hinder understandability.

- Vocabulary: participants were asked to identify vocabulary that was not suitable for Easy to Read texts.
- Expressions: participants identified difficult-to-understand expressions. In addition they were asked to assess the following three expressions: *¿Quién diablos..?* (Who the hell..?), *¡En guardia!* (On guard!), and *¡De tales señores, tales sirvientes!* (Like masters, like servants!). The first is figurative and slightly old-fashioned, the second is context-specific and refers to the request to begin a sword fight, which is also old-fashioned and hardly used nowadays. The third is an adaptation of the idiom Like father like son, which is used in colloquial Spanish nowadays.

These two features focused on the complexity and type of vocabulary for E2R subtitles as compared to the SDH counterparts, which used the original wording and expressions. According to general E2R recommendations, a language that deviates from the standard and also includes abstract words and metaphors should be avoided.

- Punctuation: participants assessed whether the use of exclamation marks hindered comprehension. Validation of punctuation focused on the use of exclamation marks, which were used in all SDH subtitles except for those formulated as questions. Validation should clarify their usefulness in E2R contexts.
- Sentences: participants were asked whether the use of questions, the conditional tense or the inclusion of contextual information affected comprehension. The assessment of this feature aimed to explore the use of the conditional tense and questions which, according to general E2R recommendations, should be avoided. The addition of contextual information as a non-standard building block of a sentence was also validated to understand to what extent such an alteration can be facilitating or hindering.

3.2 Participants

The study had the ethical approval of the participants and associations involved. The evaluation took place on the premises of the participating associations: Fundación Alas

Madrid⁴¹ (ALAS), Asociación de Padres de Alumnos con Discapacidad de Alcobendas⁴² (APAMA), and Fundación APROCOR⁴³ (APROCOR).

Plena Inclusión Madrid initiated recruiting but volunteering associations organised the groups. Plena Inclusión Madrid federates more than 100 associations for supporting people with learning disabilities. In 2016, this organisation, together with several federated associations, created a new service to develop E2R publications. In this service, training courses were offered so that people with learning disabilities from the federated associations could become validators. As a result, Plena Inclusión Madrid has developed a network of associations with these groups of validators. Only people who took part in these courses could join the groups.

In this study, SDH validation was conducted by two groups, APROCOR and ALAS, and involved 13 validators: 2 male and 11 female. As for E2R validation, it was performed by the groups ALAS and APAMA and involved 17 validators: 12 female and 5 male.

The total number of validators was 22: 15 female (71,4%) and 7 male (33,3%). Though a more balanced gender distribution would have been desirable⁴⁴, the distribution of the other demographic criteria is considered balanced. As for participant age, the average age was 42.8 (24-57) amongst female validators and 36.1 (29-41) amongst males. The mean disability percentage⁴⁵ in the female group was 61.8%, with a range from 36-77%, and of 69.1% (52-81%) amongst the males.

With regards to their educational background, all validators had undergone some level of primary education. Out of the 22, only one validator had attended a special school, and only one of them had attended secondary school.

As for validators' prior experience with the genre and with subtitles, only a handful of validators from APAMA had heard opera before. In the APAMA group, some validators stated that they were 'sceptical' of the genre and believed that they might not like it. With regards to subtitles, some validators from the ALAS group expressed having used subtitles

⁴¹ <https://alasmadrid.org/>

⁴² <https://www.apama.es>

⁴³ fundacionAPROCOR.org

⁴⁴ Until 1977, the ALAS association had only female members. Though nowadays the membership is also open for male members, most members are still women.

⁴⁵ In Spain, a disability level between 50% and 75% is considered severe, and over 75% is considered very severe.

before. In the APAMA group, almost 50% of them had used subtitles sporadically and one person reported to have used them in videogames.

A professional facilitator guided the sessions following the abovementioned 5-stage procedure. Facilitators received a copy of the video recordings with the SDH and E2R subtitles and instructions for the questionnaire. The rooms were set up so that participants were seated around computers (2-3 people per computer) to watch the opera. In one case, a session took place in a room with a large screen connected to a computer.

Prior to validation, the facilitator briefed validators about what subtitles and opera were and explained the procedure. For instance, validators were told to read the subtitles on the screen, which were coloured, and to avoid merely watching the images, which could distract them from reading. They were also instructed to report on both content and features such as font size or the use of contextual information. Validation took place in all groups in two 90-minute sessions, except for the APAMA group, whose sessions lasted 3 hours each.

3.3 Stimuli

Two types of stimuli were validated: SDH and E2R subtitles. Both validations used the same video, which had a duration of 8 minutes and 28 seconds. The SDH subtitles were compliant with the UNE 153010:2012 and followed further recommendations from Arnáiz-Uzquiza (2012). To achieve this, different colours (i.e., yellow, cyan, green, magenta, red and white) were used to identify a total of 6 different speakers, and subtitles included contextual information.

On-screen time of the subtitles was adapted to ensure readability. Albeit subtitles in opera settings can be displayed on-screen for longer time to follow the tempo (Virkkunen 2004; Oncins *et al.* 2020), this parameter could not be studied in-depth because validation required continuously pausing the recording.

Regarding the creation of the E2R subtitles, they followed the E2R guidelines by Inclusion Europe. The next section presents the results of both validations and delivers some examples.

4 Results

The following sections report on the results of the SDH validation and then on those of the E2R.

4.1 Non-editorial parameters

Results from the SDH validation outlined several differences across groups. As for font size, while APROCOR validators described it as adequate, ALAS validators suggested using a larger font. Regarding the use of different colours for speaker identification, APROCOR validators did not infer the pragmatic purpose behind the change, whereas ALAS validators described it as a feature that enhanced comprehension.

As for the use of names in brackets, ALAS validators described the technique as confusing and explained that it was not possible to understand whether the name was referring to the person speaking at that very moment or to the next speaker.

Non-editorial validation also included the assessment of end-users' preferences with regards to contextual information and the use of a number followed by an 'x', for instance 2x, to signalise that a line had been repeated. With regards to the use of contextual information, both groups described it as unnecessary. Moreover, the ALAS group stated that validators did not associate '*Risas*' (laughter) to characters laughing at that very moment. Though validators did not perceive the presence of contextual information as hindering, it was suggested to omit it because it was accessible both aurally and visually. The use of "2x" to signal repetitions did not receive any mentions.

Lastly, data about on-screen times and the length of the subtitles showed that validators considered them to be appropriate. However, it should be stressed again that data concerning these two parameters can only be regarded as partially validated since validation required continuous pausing.

In light of these results, E2R subtitles were created by prioritising the E2R recommendations. As shown in Table 1, a larger font size and line length were used. The other features – which are not mentioned in the E2R guidelines – were kept with one exception, namely the use brackets for speaker identification.

Table 1. Chapter 6. Non-editorial features

	SDH		E2R
	APROCOR	ALAS	Adaptation
Font size	smaller size: adequate	smaller size: too small	larger font
Use of colours	not understood	Enhancing	applied
Names in brackets	--	Confusing	ruled out ⁴⁶
Contextual information	not necessary	not necessary	applied
On-screen times	ok	ok	applied
Line length	ok	ok	(partially) applied ⁴⁷
Other: repetitions (2x)	--	--	applied

E2R validation of non-editorial parameters showed similar preferences among validators. Both groups considered the larger font size as adequate. While APAMA validators explained that a larger font size would hinder viewing because subtitles and images would overlap. They also confirmed that a smaller font size would be challenging to read. With regards to legibility, APAMA validators reported some issues with the font type. For instance, the word '*¡Parad!*' (Stop!) was decoded by some validators as '*¡Pared!*' (Wall).

As for the use of colours, validators agreed that this technique supports understanding. However, APAMA validators elaborated on the fact that, during given scenes, it was still challenging to identify the speaker. On the one hand, validators based this difficulty on the low quality of the video recording. On the other hand, validators explained that speaker identification is especially demanding in scenes in which four colours appear, mainly because the colour assigned to a character might have changed. For such scenes, participants suggested matching the colour assigned to the speaker to that of the speakers' clothes (blue or red according to the family in this opera). In addition to this suggestion, validators proposed adding the name of the speaker to the subtitle line. This suggestion

⁴⁶ The use of this parameter was omitted in the E2R subtitles.

⁴⁷ The E2R version required longer line in some cases.

converges with the SDH recommendation to use labels 'only to support clarity and when the use of colours is not possible or does not support clarity' (AENOR 2012: 11).

As for the use of 2x for signalling repetitions, only the APAMA group partially understood the intention behind this. The group explained that the use of 'x' should be replaced by the word 'veces' (times) in order to be correctly understood and compliant with the E2R guidelines. Regarding the on-screen time, ALAS validators agreed that the displayed times were adequate, whereas APAMA validators identified a total of 9 exceptions. APAMA validators explained that the difficulties were related to the on-screen times and not to the length of the subtitle lines, which was described as adequate. Moreover, validators stated that a maximum of 2 lines would be suitable. Nonetheless, for the final version of the E2R subtitles, some subtitles had to be shortened in order to provide enough reading time. Figure 3 provides an example.



Figure 3. Chapter 6. Shortened subtitled line

Figure 4 shows an E2R subtitle after SDH and E2R validation. In this case, the E2R subtitle uses colour for speaker identification and a larger font-size, and it does not include contextual information.

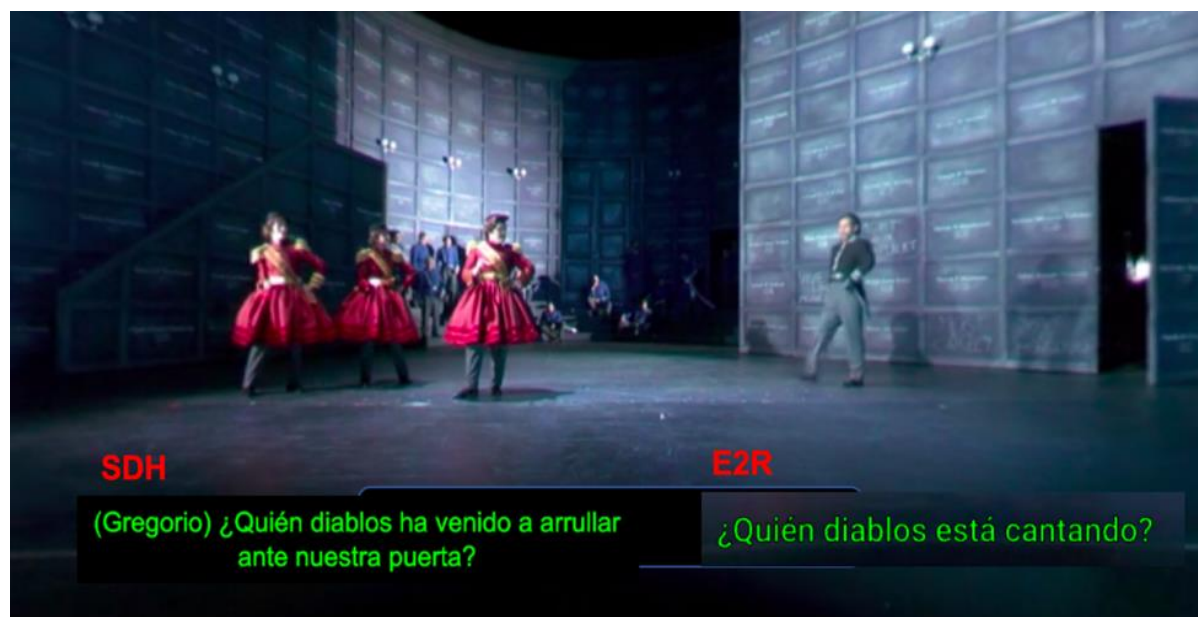


Figure 4. Chapter 6. Example of non-editorial parameters

4.2 Editorial parameters

The data from the SDH validation showed that the two groups faced comprehension barriers related to linguistic information. The ALAS group specified that difficulties in understanding were due to unknown vocabulary and expressions, which validators overcame by searching for synonyms within the group. Though APROCOR did not add comments at this point, the filled-in answers showed that the difficulties identified were also related to the language, vocabulary, and expressions used in the subtitles. This group concluded that the “theatrical style” of the SDH subtitles are a comprehension barrier because they are either not understood at all or hardly understood. Altogether, SDH validation data yielded a list of 21 words and expressions, which were identified as not suitable for E2R texts. Lastly, none of the groups considered the use of special characters or the conditional tense as hindering.

Given these results, the creation of the E2R subtitles focused mainly on using less complicated words and expressions. The following table presents examples of the SDH subtitles and their adaptation prior to E2R validation.

Table 2. Chapter 6. Difficult expressions and vocabulary

SDH subtitle	E2R adaptation prior validation
¿Quién ha venido a arrullar delante de nuestra puerta?	¿Quién está cantando delante de nuestra puerta?
¡Pardiez!	No, no me gusta.
Pues bien, si tu brazo flaquea, ¡seré yo quien haga los honores!	Pues bien, si tú no luchas, lucharé yo.
¿No es el mismo al que echamos ayer a punta de puñal?	¿Os acordáis de este muchacho? Sí. Lo echamos ayer a punta de puñal.
¡El mismísimo! ¡Qué imprudente!	Sí, es él. ¡Qué atrevido!
¡Tenéis una lengua ligera, señor	Señor, usted habla mucho.
¡Si la música es de este tipo podemos darle réplica!	Yo manejo muy bien la espada. Puedo demostrárselo.
¡Remonta el vuelo al cielo, prudencia infame!	Estás herido por mi culpa.
¡Capulet, estirpe inmundada!	¡Los Capuleto sois odiosos!
¡Vuestra tórtola escapará!	¡La muchacha se escapará!
¡Vil Montaigu desenvaina la espada!	Los Montesco sois despreciables. ¡Lucha con la espada!
¡Pagarás por esta indigna traición!	Pagarás por este insulto.
No me conoces, Tybalt, tus insultos son en vano.	No me conoces, Teobaldo. Tus insultos no sirven de nada.
¡No, vengaré la injuria!	No, no puedo permitir que te llamen cobarde.
¡Que el infierno secunde vuestro odio y vuestro furor!	¡La rabia y el odio son mis aliados!
¡Al diablo con vuestros linajes!	¡Malditas sean vuestras familias!
¡Yo la invoco!	Sí, lo sé.
Con esa boca maldita osaste hablar a Juliette, que te estaba prohibida	Te habíamos prohibido hablar con Julieta. Pero ayer hablaste con ella.
¿Crees que tus ofensas pueden ser perdonadas? ¡Traidor!	No vamos a perdonarte tus insultos. ¡Traidor!
¡Oh, despiadado destino!	¡Qué desgracia!
¡Lo trae aquí el diablo!	¡Romeo ha venido!
¡Por guitarra ahora tengo una espada!	Ahora tengo una espada.

The validation of the E2R subtitles showed that validators understood the vocabulary, albeit some words were identified as more difficult to understand. Overall, validators identified a total of 7 expressions that were not accessible. Some examples of the assessed expressions are discussed in the following paragraphs.

Though figurative, the expression '*¿Quién diablos está cantando delante de nuestra casa?*' (Who the hell is singing in front of our door?) was understood in both groups. The APAMA validators discussed the result of avoiding the word 'diablos' and agreed that though such a modification would not change the meaning of the sentence, it would not convey the sense of anger felt by the speaker.

The expression '*en guardia*' (On guard) was understood by one group as intended in the text, namely as an appeal to start a fight. In contrast, the second group understood the word 'guard' literally, which in Spanish also means 'policeman/policewoman' and led to a misinterpretation of the scene since validators expected to see a police officer on stage. The expression 'like father, like son' was understood by only one group.

The following expressions were identified as not easy-to-understand by at least one of the validation groups and should be avoided: '*Con gusto*' (with pleasure), '*La rabia y el odio son mis aliados*' (rage and hate are my allies), '*Echar a punta de puñal*' (threaten with a dagger), '*Te doy mi palabra*' (I give you my word), '*Quería ser prudente*' (I wanted to be cautious).

As for the use of questions and exclamation marks or the conditional tense, validators agreed that these linguistic parameters did not affect understanding. APAMA validators expressed that the sentences in the conditional tense were well understood since they were contextualised and supported by the images.

4.3 Global comprehension and user experience

The questionnaire submitted to validators requested that they leave a final statement with regards to global comprehension and their viewing experience. Both E2R validation groups defined the E2R subtitles as comprehensible. The APAMA validation group, which had only validated the E2R subtitles, specified in their feedback that the subtitles were comprehensible and pointed out that the difficulties experienced were more related to their lack of familiarity with opera and reading subtitles. APAMA's facilitator emphasised that the repetitive nature of the process might have led to a biased answer to this final question. As for the ALAS group, validators described the subtitles as comprehensible and noted that, 'this time [E2R version]', did not encounter any vocabulary problems.

As for the participants' experience, all validators, SDH and E2R, expressed having enjoyed the experience. The (E2R) APAMA facilitator mentioned that validators showed mixed feelings towards the study prior to validation and described their attitude as interested but sceptical. After the sessions, validators expressed that they had enjoyed the experience and highlighted that validation had helped them to both understand and, to a certain extent, also appreciate opera more.

5 Conclusions

The results of this study support the initial assumption that subtitles can be made cognitively more accessible by using Easy to Read as a simplification method and SDH parameters as a reference point. However, validation also brought to light constraints and, thus, the transferability of SDH parameters and recommendations to E2R is limited. This outcome supports the conclusions by Bernabé and García (2019) that while some parameters and recommendations are shared (e.g., on-screen placement, number of subtitling lines, font type, contrast), others are not (e.g., font size, use of abbreviations). Moreover, validation results identified unnecessary parameters as in the case of contextual information, which was identified as redundant, given that the information was perceived aurally.

Other results regarding non-editorial parameters outlined that the font type may hinder the recognition of single characters, and can affect understanding as a whole. The use of colour for speaker identification, along with the use of labels in scenes with several speakers are areas in need of further study. It is interesting to note that E2R validators themselves suggested the use of labels as a complementary technique to colours, which converges with the SDH recommendations. It could even be presumed that validators would accept the use of colour as a first-line technique and rank the use of labels as a secondary measure.

As for the length and on-screen times of subtitles, the feedback only provides a few hints, since in order to discuss the understandability of the subtitles, the recording needed to be paused. However, results show that validators agreed to 2-line subtitles as well as longer subtitle lines as long as on-screen times enabled viewers to complete reading. By prioritising reading time, the study of these parameters, length and time on-screen, may lead to recommendations that are different from SDH and, for instance, allow for subtitles to stay on longer even if there has been a scene or frame change. Lastly, while the use of simplified language and expressions has shown to be a key factor supporting comprehension, other features, such as font type, have emerged as equally important.

With regards to validation, the process as developed by Plena Inclusión Madrid has shown that it is able to undergo adjustments as well as to enable validators to assess other types of content beyond written or printed information. At the same time, validation has confirmed that it requires end-user participation which, in turn, opens up new job opportunities for all, particularly for persons with reading and learning disabilities.

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Chapter 7. Summary

The development of access services that provide a way to overcome cognitive barriers in audiovisual communication is gaining momentum. One example is the academic attention that some text simplification methods, such as Easy-to-Read (E2R), have received in the last few years. While it has been shown that E2R has enabled access for persons with reading and learning difficulties in written communication, its realisation in multimodal formats, like audiovisual contexts, is lagging. This PhD thesis aims to further develop an Easy-to-Read audiovisual content by investigating the following research question: can Easy-to-Read be used to simplify audiovisual content to make it more accessible for people with reading and learning difficulties?

The PhD encompasses five, peer-reviewed publications. The research conducted has been labelled as applied research within the applied branch of translation studies. In this sense, the thesis considers access services holistically (content and technology). In other words, it approaches the proposed access services by taking into consideration that the AV content needs to be Easy-to-Read as well as the ease of access to the service and its operation on the whole.

The research methodology has been categorised as applied research (Saldanha & O'Brien, 2014; Williams & Chesterman, 2002). As such, it borrows concepts and outputs from the fields of audiovisual translation and text simplification to test the hypothesis stated: that E2R-simplified AV content is easier to read and understand by persons with reading and learning difficulties. The sources used in the thesis are mainly based on secondary data due to two main constrains. Firstly, the lack of evidence-based research and outputs in the field (Bernabé & Orero, 2019). Secondly, the scarce amount of scholarly information available at the time of starting the PhD in 2017.

The first three articles draw their conclusion from secondary data. By doing this, the following expectations were set: gaining a deeper understanding about Easy-to-Read as an access service (Article 1), and the effects of adding a layer of E2R to existing workflows in the case of audio descriptions (Article 2). For its part, Article 3 aimed to classify E2R as translations within the AVT landscape by drawing upon Gottlieb's (2005) semiotic classification.

Conversely, the last two articles are case studies with a single unit of investigation (Williams & Chesterman, 2002). The fact that the case studies were carried out towards the end of the PhD allowed for additional insight. These included how to identify parameters for creating subtitles (Article 4), and how such Easy-to-Read subtitles are received by end-users with reading and learning difficulties (Article 5).

Overall, the conclusions indicate that text simplification recommendations taken from Easy-to-Read can be used to generate audiovisual content that is accessible for audiences with reading and learning difficulties. Such new E2R access services may render the message by using equivalent or different semantic material than their standard counterparts (i.e. subtitles, audio descriptions). For instance, in some cases, it might be necessary to add new content to ensure that there are no coherence breaks. Likewise, sometimes E2R access services may differ semiotically from their standard counterparts. For example, it might be necessary to use pictograms instead of text in a subtitled line. Lastly, as digital products, E2R access services also ought to be WCAG-compliant at a service level.

Validation by end-users was identified in this thesis as a way to establish whether a text is easy or difficult to understand. The literature reviewed reveals that validation can be of different types and can be carried out at different stages. For instance, end-users can validate content during production, as part of the creation process, but also after production through online feedback. As for the types of validation, validation may only concern the application of specific guidelines (readability) or understandability. While in the first case, a person without reading or learning disabilities may carry out this task, in the latter, end-users' involvement is compulsory.

Lastly, this thesis has been labelled as an initial contribution to the field of Easy-to-Read audiovisual content. Though the conclusions withdrawn cannot be regarded as conclusive, the procedures and practices described can be transferred to similar cases and, thus, foster and facilitate the development of easy multimode access services.

Chapter 8. Conclusions and further research avenues

Making meaning of a message is a challenging task in communication. Thus, when a message is constructed without taking into consideration receivers' needs and abilities, communication may fail. Said otherwise, the content itself might become a communication pitfall, i.e. a barrier.

This thesis explores Easy-to-Read as an enabler of easy multimode access services to make audiovisual content easier to understand for persons with reading and learning difficulties. Under the banner 'simple is more', the text simplification method Easy-to-Read was studied as an access service and found by the author within the field of audiovisual translation. The case studies show that an easy way to promote these new access services is to merge existing knowledge from academic (e.g., AVT and text simplification) and professional fields (e.g., E2R guidelines).

The next subsections briefly recount the answers provided to the research question and discuss the implications and contribution of the insights gained in the thesis to the field at large. The chapter closes the PhD by outlining new avenues for prospective studies.

1 Revisiting the research question and objectives

This section reviews the research question, and the achievement of the objectives set out. To do so, it summarises the conclusions from each article and elaborates on their contribution to the project as a whole.

The research conducted in this PhD aimed to answer the research question of whether Easy-to-Read could be used to simplify audiovisual content in order to make it more accessible for persons with reading and learning difficulties. The insights and primary data collected support the presumed ability of E2R to act as an enabler of easy media access services. Therefore, it is expected that the use of this simplification method and its principles will increase in the near future. Greater attention by scholars is also likely. One example is that of the on-going European co-funded project EASIT⁴⁸, the idea for which stemmed from Pilar Orero and the author of this thesis.

⁴⁸ Easy Access for Social Inclusion Training.

This example, as well as the number of scientific contributions generated by the EASIT project, underlines the identified need for audiovisual content that is accessible for persons with reading and learning difficulties. Furthermore, the fact that this scholarly work is also considering E2R as a simplification method highlights the presumed suitability of Easy-to-Read as a way forward. The next subsections present the conclusions of each article.

1.1 Article 1. Easy to Read as Multimode Accessibility Service

Article 1 explored the first hypothesis of this PhD, which claimed that Easy-to-Read acts as an access service. To this end, research was carried out to explore whether Easy-to-Read serves a similar function to that of audiovisual access services. The investigated secondary data revealed that Easy-to-Read does indeed act as an access service for written content. This means that E2R already provides persons with reading and learning difficulties with an alternative way to access written content. In this sense, the hypothesis can be regarded as supported by the conclusions; however, only with regards to written content.

The study of the connection between Easy-to-Read and access services in audiovisual translation had further implications on the PhD as a whole. The presumed ability of E2R to be a multimode enabler was connected to the role ascribed to E2R in the literature as a functional language variety. As such, E2R can be used to create spoken and written content (multimode) that is easier to understand (function). Likewise, the yielded easy content can be conveyed aurally and visually (multichannel). At this stage, one question came to the fore: whether this functional language variety could replace a standard language on a one-to-one basis to create E2U access services. Article 2 explored this issue by studying how the use of E2R may affect the creation process of access services at the different stages: (a) analysis of source text and target users' needs, (b) production, and (c) validation.

Lastly, the study of E2R as a communication enabler in digital contexts outlined the need for considering 'access to service' as well. This broader approach, which considers the compliance of access services with the WCAG guidelines, stems from the placement of the thesis within the applied branch of translation studies.

Overall, the outcomes of Article 1 sustained the categorisation of Easy-to-Read as an access service that uses text simplification to make audiovisual content accessible for persons with reading and learning difficulties. In this light, the objectives can be considered achieved and the assumption behind H1 supported.

1.2 Article 2. Easier audio description: Exploring the potential of Easy-to-Read principles in simplifying AD

This article aimed to achieve the second objective (O2): to explore whether the E2R recommendations and guidelines by Inclusion Europe and IFLA could be integrated into existing workflows in the case in point of audio description. The hypothesis (H2) was that Easy-to-Read guidelines and recommendations could be used to create access services that enable access for persons with reading and learning disabilities. WCAG guidelines were also taken into consideration in order to be consistent with the framing of the thesis within the applied branch of translations studies. Overall, the insights gained from secondary sources support the viability of incorporating E2R and WCAG guidelines into the creation process of access services. Therefore, H2 is regarded as supported and Objective 2 as accomplished.

Despite two main limitations: a) that only one workflow was studied, and b) that no AD example was included, the contribution of Article 2 to the PhD was twofold. Firstly, it allowed the author to try out a simple solution to a practical problem. In other words, it was possible to outline a workflow for creating audio descriptions that provides access for persons with reading and learning difficulties by integrating existing guidelines from E2R and WCAG. Secondly, it highlighted the fact that by taking into account E2R guidelines and recommendations some characteristics of the standard access services may change.

The latter overlaps with Article 1 in that it outlines that creating Easy-to-read access services goes beyond replacing a standard language with a simplified language variety such as Easy-to-Read. Instead, it suggests that adding a layer of Easy-to-Read to workflows triggers changes in the characteristics of standard access services. Article 3 was dedicated to study the extent to which access services that use a text simplification method, like Easy-to-Read, differ from their standard counterparts.

1.3 Article 3. New taxonomy of easy-to-understand access services

Article 3 drew upon Gottlieb's semiotic classification within the field of audiovisual translation to categorise translations that use a text simplification method, as well as to provide an initial taxonomy. In this sense, Objective 3 is considered achieved. The semiotic approach chosen underscored differences in the semiotic identity of access services that use text simplification methods as compared to standard services (e.g., Easy-to-Read subtitles versus subtitles). This outcome supports the third hypothesis of the thesis (H3) that these new services have their own identity.

The exploration in Article 3 included not only Easy-to-Read as a simplification method but also Plain Language and Easy Pictogram⁴⁹. The fact that these methods use verbal and non-verbal elements justified the semiotic approach adopted. The main contribution of the semiotic classification of these new access services is not the novelty of such. To the contrary, its most important contribution is that it allows services to be situated within a well-established and acknowledged AVT framework, such as Gottlieb's semiotic classification.

For the PhD as a whole, this outcome implied that access services that use text simplification methods such Easy-to-Read can be regarded as inspirational translations that use language in a non-standard way and act as text enhancers. This functional role of access services that use simplification methods was already outlined in Article 1. In Article 3, this ascribed role once again finds itself classified as a "text enhancer[]" with a focus on how target texts are cognitively perceived (Gottlieb, 2005, p. 37).

The outcomes of Article 3 also revealed similarities between access services that use a simplification method and their standard counterparts. In these terms, both types of access services seem to be channel-equivalent, because the same semiotic channels are available to users. However, the degree of channel-equivalence depends on the sensory and cognitive capabilities of audiences. For instance, the number of channels available to a blind person when watching an audio-described or easy audio-described movie are always restricted, regardless of his/her cognitive needs.

Conversely, the number of channels available to a person with cognitive needs who has no sensory loss are the same. For instance, in this latter case, the person will access content through the same channels as in the original plus the (redundant) information through the audio description. This aspect delivers an interesting starting point to explore to what extent channel equivalence and redundancy can help comprehension in these audiences.

Lastly, also in Article 3, not only was access to content considered, but access to the service was examined. To this end, the accessibility of E2U access services was explored from a user-centric perspective, also known as human-centred⁵⁰. The aim was to explore the accessibility chain of access services or, in other words, how accessibility can be taken into consideration throughout the entire interaction.

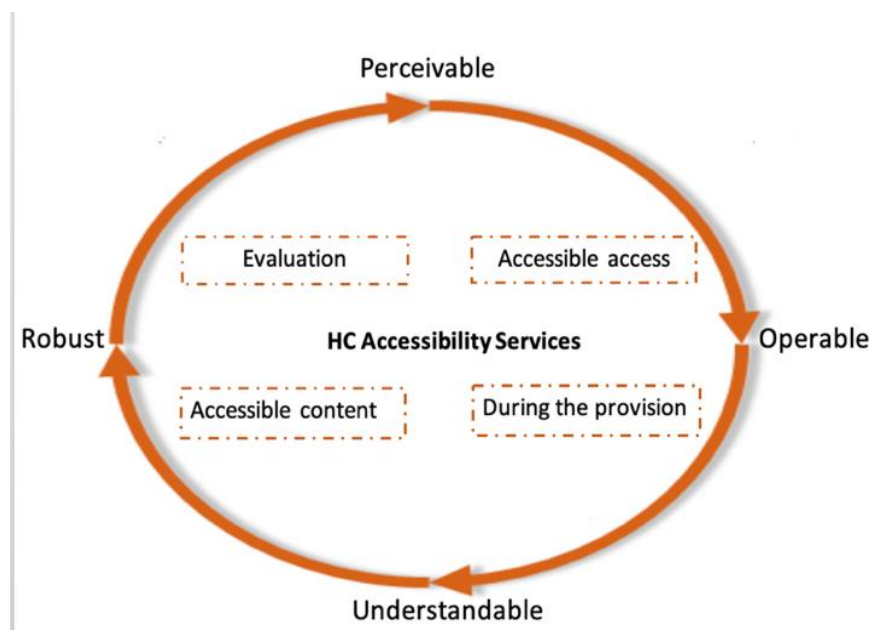
⁴⁹ The term 'easy-to-understand (E2U)' was used to refer to the three of them. Though 'easy to understand' is not yet an established term, it was already used by IFLA in their guidelines from (1997, 2010) and is currently being used in the EASIT project.

⁵⁰ The term 'user centered design' was introduced by Don Norman in 1998. In 2013, the author suggested the use of human centered design instead.

The resulting outcome is an initial set of recommendations that gathers knowledge from experience-based sources (e.g., IFLA, Inclusion Europe, WCAG, UNE 170001-1). The accessibility chain described and the recommendations collected lack empirical evidence but are grounded on well-known professional sources. As such, these results may lend themselves less to generalisation, but are indeed transferable and useful in similar situations.

Figure 5 illustrates that the accessibility chain places end-users at the heart of all actions. In the case of Easy-to-Read, their involvement in the so-called validation process seems to be a key factor, as derived from the literature reviewed.

Figure 5. Chapter 6. Human-centered accessibility chain of access services



1.4 Article 4. Identifying parameters for creating Easy-to-Read subtitles

Article 4 is based on a case study that set out to identify subtitling parameters that can be used to produce Easy-to-Read subtitles. The two guidelines used were the Spanish standard on Subtitling for the Deaf and Hard-of-Hearing published by the Spanish standardisation agency AENOR and the Easy-to-Read guidelines published by Inclusion Europe. The output was a list of sixteen parameters for production that are mentioned in both guidelines as well as three parameters that emerged from the E2R guidelines. In this sense, Objective 4 can be considered accomplished.

The lack of parameters for creating E2R subtitles was solved methodologically by resorting to experience-based sources. The parameters identified derive from a case study with a single unit of investigation (Williams & Chesterman, 2002; Saldanha & O'Brien, 2014). Although these types of results are not generalisable, their implications to the research in this thesis are significant. On the one hand, the outcome supports the initial statement that access services can benefit from knowledge from existing knowledge in AVT. On the other, the identification of parameters that diverge from the E2R recommendations and parameters deriving only from E2R underlines a core assumption. That is, that E2R access services have their own identity and characteristics.

Overall, it was possible to identify parameters to produce E2R subtitles by merging existing guidelines. Thus, the fourth hypothesis (H4) is regarded as supported and Objective 4 achieved.

1.5 Article 5. Validation of Easy-to-read subtitles

Article 5 set out to assess the reception of E2R subtitles by end-users with intellectual disabilities in order to accomplish Objective 5. The results of the case study supported the underlying hypothesis (H5) that access services that use Easy-to-Read can improve the readability of audiovisual content and support understandability. In these terms, the last hypothesis is considered as supported, and Objective 5 achieved.

The main contribution of Article 5 as a whole is that the insights gained in the case study provide empirically-based evidence that supports the assumptions made throughout the whole PhD. That is, E2R can provide persons with reading and learning difficulties with an alternative way of accessing audiovisual content. Furthermore, the study shows that involving users in research practices is necessary to obtain evidence-based recommendations. It confirms that knowledge from professional practices can offer scholars a solid starting point as well.

2 Final remarks

This PhD thesis has investigated how to tackle the need for access services that focus on the needs of persons with reading and learning difficulties. To do so, a descriptive approach was prioritised over empirical research. This choice was made based on the advantages of research methods that use secondary data to study objects that are not well defined and in situations where no previous empirical data exist, as described in Chapter 1.

Overall, the methodology enabled the author to achieve the objectives set out at the beginning. The outcomes have contributed to defining the characteristics and the multi-layered nature of access services that use Easy-to-Read. Furthermore, it is possible to support the assumption that access services can be developed by merging existing knowledge from the adjacent academic fields and experience-based sources.

At a content level, concepts were borrowed from the academic fields of AVT and cognitive text simplification. At a practical level, guidelines from the professional world were merged to create new ones, which were specific for E2R access services. These included E2R guidelines from Inclusion Europe and IFLA, the Spanish standard for subtitling for the Deaf and Hard-of-Hearing and the WCAG guidelines version 2.1. At the same time, the limitations of the applied research conducted have been outlined and taken into consideration at each step.

As such, it was possible to provide an answer to the research questions posed in Chapter 1: Easy-to-Read can be used to simplify audiovisual content to make it more accessible for people with reading and learning difficulties.

The next sections provide an overview of both the contributions to knowledge in the field, as well as some limitations.

3 Contributions to knowledge and limitations

This research work brings together three expert fields in the realm of accessibility: audiovisual translation, digital accessibility, and text simplification. By doing so, it opens up a pathway for services that enable access to audiovisual content for audiences with reading and learning difficulties.

The research based on secondary data has allowed these proposed E2R access services to be regarded as inspirational translations that act as text enhancers. The taxonomy provided has contributed to broadening the range of access services beyond those that focus merely on sensory constraints. The semiotic comparison of these new access services has thus shed light on their nature and on how they differ both semiotically and semantically from their standard counterparts. As mentioned previously, these include services such as subtitles or audio descriptions.

The outlined characteristics can provide researchers with a starting point to develop E2R access services that are separate from guidelines or established practices that prioritise sensory impairments. Furthermore, having ascribed E2R access services their own place within the AV landscape contributes to raising awareness about cognitive disability as a whole.

The study of access services as digital products and not only from an access-to-content perspective is also considered a contribution of this thesis. This approach has brought to light the need to grant accessibility at three different stages: access to service, access to content, and access to creation. This new aspect raises awareness about safeguarding the so-called accessibility chain at every stage of interaction.

Lastly, the involvement of end-users with intellectual disabilities in the empirical part of the thesis (Article 5) has contributed to work within the framework 'Nothing About Us Without Us' (UNGA, 2006). Furthermore, the outlined role of end-users as professionals in validation should contribute to new job opportunities and business models for all, particularly persons with reading and learning difficulties who work as validators. Ultimately, fostering the acknowledgement of their role can support their recognition in the labour market, strengthen their position in professional teams, and encourage inclusion and participation in professional contexts.

It goes without saying that the defined scope of a doctoral thesis limits its outcomes. The main limitation identified concerned the lack of access services for this target group and the limited amount of scholarly data available. To overcome this gap, the research approach chosen was mainly descriptive, based on secondary sources. Although the results of such an early research may be labelled as less conclusive (Singh, 2007), it was indeed possible to define Easy-to-Read as an access service (Articles 1 and 3). The characteristics that make up its identity were also able to be delineated (Articles 2 and 3). Furthermore, it has been possible to provide a first set of parameters for creation of E2R subtitles (Article 4) and to describe a workflow for validation (Article 5) based on current practices for E2R written content.

4 Recommendations and future directions

This section outlines research avenues that have emerged from the PhD thesis. The lines of investigation concern the varied facets of Easy-to-Read access services and their interrelations, as recommended by scholars in the field. These include, for example, function, process and product, (Toury, 1995, 2012), as well as participants and context (Saldanha & O'Brien, 2014).

Article 1 led to the conclusion that Easy-to-Read already acts as an access service. In this sense, it could be interesting to see how this service is received by other target demographics (Toury, 1995), including, for instance, the elderly or displaced populations. The first article also pointed out that E2R access services can be combined with existing technologies. One example thereof would be to use E2R subtitles to create audio subtitles. Within this context, users' preferences regarding the preferred channel(s) could be investigated. Results would shed light on what channel or channels are preferred by users of E2R content.

Article 2 studied the creation process in the case of audio description and the effects of adding a layer of E2R to existing workflows. The insights gained pointed out that E2R does indeed change, to a certain extent, the characteristics ascribed to the standard they derive from. For instance, easy audio descriptions seem to lead to new types of cues, and to cues that are more informative than descriptive. In this sense, it would be interesting to explore the reception of these new cues by users.

An avenue at a methodological level would be to investigate how current knowledge and practice in text simplification can be transferred to other working contexts such as live ones (e.g., radio, live events, court reporting) or gaming. These are emerging subfields that would directly benefit and complement incipient research, including simplified respeaking (Eugeni, 2017) and the radio news in plain language *Nachrichtenleicht*⁵¹ in Germany.

⁵¹ <https://www.nachrichtenleicht.de/was-ist-nachrichtenleicht.2053.de.html>

Also, the “textual-linguistic makeup” (Toury, 1995, p. 37; Ramos Pinto, 2006) could be studied. This line of investigation also draws upon the outcomes of Articles 2 and 3. For instance, one could study how the use of simplified language, less vivid or enriched, influences user engagement and the rendering of meaning. One question related to the latter would be to what extent lexical simplification supports or hinders meaning in certain contexts and for specific types of text, as discussed by Ramos Pinto (2006) in the context of stage translation. Or, does phonological simplification support readability and understandability?

At a realisation level, the use of linguistic scaffolding strategies as it is the case of the capito method⁵² could be studied as a strategy to produce easy-to-understand content. This could lead to strategies for simplification scaffolding and a higher customisation of access services.

The approach of E2R access services as digital products could also be studied. Any research in this area would increase awareness about the need for WCAG compliance to enable interaction for persons with the broadest range of sensory and cognitive abilities. Ultimately, an increased awareness would also contribute to higher visibility of the need for cognitively accessible content and greater recognition of current professional profiles, such as validators, facilitators, and translators.

Empirical research about users’ experience would provide qualitative data in terms of the level of awareness, acceptance (technological and quality of the experience), and enjoyment (Córdoba-Cely, 2012). Also, as identified in Article 4, the role of customisation as a key enabler for providing personalised solutions through technology could be studied. The study of the ability of E2U access services to be customised by users could identify features beyond basic options, such as to turn on/off the subtitles during the interaction. This may lead to extended features that could enable users to design their own experience during viewing. For instance, the user could decide whether or not to access additional information or even to have a multichannel experience.

Additionally, the study of validation will contribute to understanding how readability, understandability, and user experience can be validated, by whom, and when. A deeper understanding would contribute to both the development of workflows and quality assessment strategies. In the long-run, a specialised methodology could then emerge.

⁵² <https://www.capito.eu/en/projekt/easy-to-read-language/>

Lastly, from an overarching and professionally-oriented perspective, the influence of Easy-to-Read on the profession and the training would shed light on the skills and competences that translators must necessarily acquire. This development will also help to tackle the need for new curricula and materials for training new professionals, such as the expert in easy-to-understand language (Arias-Badia, 2020).

Chapter 9. Updated references⁵³

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⁵³ APA (6th edition) referencing: <https://libguides.jcu.edu.au/apa6th/web>

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