

The accessibility of *BBC* television to users with disabilities: from the law to user satisfaction

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Abstract

Universal accessibility to public television guarantees the fundamental right to receive media information and promotes social inclusion. British audiovisual regulations impose minimum quotas for subtitling, audio description, and sign language to make content more accessible to people with visual or hearing impairment. However, these minimum requirements do not ensure full user satisfaction. The aim of this study is to present a descriptive analysis of user satisfaction with the accessibility of *BBC* public television services, both linear and on demand, and collect the improvements demanded by users. The survey method was applied, interviewing 442 UK residents who were users of subtitles, audio description, and sign language, mostly people with disabilities or members of their families. The questionnaire also included qualitative questions to capture basic demands identified by the users. One of the main results is the need to improve the quality and synchrony of live subtitling, and to increase the fractions of programming with audio description and sign language. Moreover, beyond compliance with the law, it is essential to listen to the opinions of users with visual or hearing impairment to ensure that services fulfill their mission of guaranteeing audiovisual accessibility and promoting social inclusion.

Keywords

Television users; Subtitles; Audio description; Sign language; Public television; Audiovisual accessibility; Visual impairment; Hearing impairment; Deaf people; Social inclusion; *BBC*.

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1. Introduction and current situation

The fundamental right to freedom of expression also includes the right to receive information under equal conditions and without any type of discrimination (**Storch-de-Gracia-y-Asensio**, 2007). This has been enshrined for decades in international standards such as the *Universal declaration of human rights* (1948) or the *European convention for the protection of human rights and fundamental freedoms* (1950). Access to information and communication services is therefore considered to be a reflection of the right to freedom of expression and unrestricted access to the media, having a significant impact on all areas of life (**Greco; Jankowska**, 2020).

However, audiovisual content suffers from obvious access barriers for people with visual or hearing impairment (**Caballo-Escribano; Verdugo-Alonso**, 2005; **Rodrigo; Tabuenca**, 2020). Approximately 11 million people have some form of hearing loss in the UK, and almost 2 million have some form of visual impairment, of which 360,000 are blind or partially sighted. To make audiovisual content accessible to this population, subtitling, audio description, and sign language services are added.

In the UK, since the enactment of the Communications Act 2003, *Ofcom* has been the body responsible for periodically publishing the requirements in terms of accessibility quotas for British television channels. The *BBC*, for instance, must broadcast 100% of its programming with subtitles, 20% with audio description, and 5% with sign language (*Ofcom*, 2021a). Based on these requirements, the *BBC* publishes an annual report that includes the levels of accessibility of its content in terms of subtitling, audio description, and sign language. Data from the last five years show that the *BBC* has met the minimum requirements established (*BBC*, 2018; 2019; 2021), but this does not necessarily imply full satisfaction for users with visual or hearing impairment. In fact, in the specific case of sign language, we observe how the fraction has remained stable at a level close to the minimum requirement (Table 1), despite demands for an increase in signed programming (**Bosch-Baliarda; Orero; Soler-Vilageliu**, 2020). According to **Stone** (2007), this occurs because television channels include accessibility services to comply with the law but without seeking universal accessibility. This indicates a disconnection between the minimum requirements and the provisions by television stations versus the perception and demands of users, which leads us to our initial hypothesis that, although the minimum legal requirements are met, an improvement in the accessibility of services is still required to meet the needs and demands of users.

Table 1. Evolution of accessible programming on the *BBC*

	2016/17	2017/18	2018/19	2019/20	2020/21
Subtitling	100%	100%	100%	100%	100%
Audio description	29.78%	31.64%	33.38%	32.58%	29.14%
Sign language	5.37%	5.62%	5.57%	5.58%	5.75%

Source: *BBC* annual reports and accounts 2018; 2019; 2021. Percentages obtained from the average of the national channels: *BBC One*, *BBC Two*, *BBC Four*, *CBBC*, *CBeebies*, and *BBC News*.

The aim of this study is thus to go further to provide a voice to users who watch the *BBC* with subtitles, audio description, and sign language to answer the question: How satisfied are users with these services? In this way, the main objective of the work is to determine the opinion of users of accessible content on British public television, especially those with visual or hearing impairment, as well as their level of satisfaction with the quantity and quality of these services and their proposals regarding which aspects could be improved.

Charities as well as academia have long called for such understanding of the opinions of users and that it should be them who evaluate the accessibility of services (**Forestal**, 2015). In the case of people with disabilities, this issue becomes even more important, since it is linked to the “nothing about us without us” movement championed by charities for decades (**Robinson; Sheneman; Henner**, 2020). This is a response to “capacitism,” i.e., the specific discrimination against people with disabilities that has meant that, throughout history, decisions that affect them have been made by external agents without disabilities who are considered to be more qualified. Capacitism thus leads to a form of structural abuse (**Sheneman; Robinson**, 2020), since the decision-making power is held by doctors, interpreters, legislators, etc. rather than people with disabilities themselves.

For this work, we selected the *BBC* for a case study, because this broadcaster is considered to represent a benchmark in terms of its public service mission (**Hallin; Mancini**, 2004). Likewise, it was the first broadcaster to introduce subtitles (**Ivarsson; Carroll**, 1998) and has been a benchmark and role model regarding accessibility for decades (**Fernández-de-Villalta**, 1988; **Fuentes-Luque; González-Irizarry**, 2020; **Pereira-Rodríguez**, 2005). A total of 442 online surveys were distributed via more than two dozen organizations for people with visual or hearing impairment in the UK to reach users of accessibility services. In this way, we are able to directly measure the opinion, satisfaction, and proposals for improvement of those who use the subtitling, audio description, and sign language services of the *BBC*.

“Subtitling was the first accessibility service to be implemented on television, followed by audio description and sign language”

1.1. Accessible public television for social inclusion

Action on Hearing Loss, formerly the *Royal National Institute for Deaf People (RNID)*, one of the leading organizations for deaf people in the UK, considers that, among the media, television is a primary source of information, education, and entertainment as it provides a crucial link to the outside world and many of the cultural ties that bind us as a society. This explains why users with hearing impairment consider that the increase in subtitling on television has led to a significant improvement in their quality of life (RNID, 1999). Indeed, subtitles on television reduce access barriers to culture, information, and entertainment (Cambra; Silvestre; Leal, 2015), which in turn promotes equality and the advancement of deaf people in society (Wurm, 2007). In fact, subtitling was the first accessibility service to be introduced on television, followed by audio description and sign language.

We study herein the accessibility specifically of public television. This is because public television services are a key concept on the European audiovisual stage within the context of the welfare state. In fact, the *Protocol on the system of public broadcasting in the member states of the Treaty of Amsterdam* establishes a direct relation to the democratic, social, and cultural needs of each society and to the need to preserve the pluralism of the media (European Union, 1997). Although there is no single model or definition for a public television service, there is wide consensus in the scientific literature regarding its functions, which include universal accessibility as well as respect and consideration of diversity and minorities (Blumler, 1993; D'Haenens, 2021).

In 1985, the *Broadcasting Research Unit (BRU)* constructed a list of the eight essential principles of public television in the UK, with universal accessibility standing out as the first and most important (Debrett, 2010). Indeed, the BBC itself understands that its mission is to act in the public interest, serving all audiences by providing impartial, high-quality, and distinctive output and services that inform, educate, and entertain (BBC, 2016). To achieve this, the BBC must comply with the standards on television accessibility established by *Ofcom* that aim to ensure that people with visual or hearing impairment can enjoy public audiovisual services.

1.2. Regulation of audiovisual accessibility in the UK

To guarantee the universal accessibility of content, laws and regulations have been created to define both the amount of accessible programming that televisions must offer and the guidelines that must be followed when applying subtitles, audio-description, or sign language to audiovisual content.

At the international level, the *Convention on the rights of persons with disabilities*, issued by the *United Nations* in 2006 and currently ratified by 182 countries, marked a step change in the obligation for audiovisual content to be made accessible. Article 30 of this convention recognizes the right of people with disabilities to enjoy television programs, films, theater, and other activities in an accessible format in order to guarantee equality and their participation in cultural life (United Nations, 2006). The above-mentioned convention and protocol are considered to represent a first step towards the regulation of accessibility at the international level (Zárate, 2021).

In Europe, the *Audiovisual media services directive* establishes that the right of people with disabilities and older people to participate and integrate in social and cultural life is inextricably linked to the provision of accessible audiovisual media (Zárate, 2021). This directive establishes that the main accessibility services are subtitling, audio description, and sign language, and that the Member States are responsible for applying minimum quotas that each television service should provide.

In the UK, subtitling was introduced in the *Broadcasting Act* of 1990, while audio description and sign language were introduced into this act in 1996. A year later, the *Broadcasting (sign language) order* of 1997 established that 5% of weekly programming should be signed. This obligation was established over a 10-year horizon, establishing the *Independent Television Commission (ITC)* as the body responsible for confirming compliance.

Later, in 2003, the European Year of People with Disabilities, the *Communications act* was enacted. This rule established that audiovisual content should be accessible and gave *Ofcom*, the regulatory body that replaced the ITC, the obligation of creating and periodically reviewing a code that would guarantee this. This *Ofcom* standard is the *Code on television access services* (first published in 2004 and last updated in 2021), which establishes that British public television must provide subtitling to 100% of its content, audio description to 20%, and sign language to 5%. In summary, it establishes the requirements on subtitling, audio description, and sign language in accordance with the *Communications act* of 2003. Likewise, *Ofcom's Guidelines on the provision of television access services* (*Ofcom*, 2021b) establish the rules regarding the characteristics of these services, i.e., the qualitative aspects that guarantee their homogeneous application and that certain quality standards are met to ensure they are useful to users.

Finally, audiovisual consumption in new linear and on-demand formats has clearly grown recently, especially among the youngest audiences (Jiménez-Morales; Montaña; Medina-Bravo, 2020). This implies that accessibility obligations must transcend traditional formats and also be integrated into both linear and on-demand

Regulations on accessibility establish minimum quotas so that people with disabilities can enjoy audiovisual content on an equal basis

content (**Bolaños-García-Escribano; Díaz-Cintas; Massidda**, 2021). In fact, the *Code on television access services (Ofcom*, 2021a) establishes that accessibility requirements will also apply to online audiovisual content accessed through a regulated electronic program guide. The *BBC* has gradually included accessibility services in its linear and on-demand content on the *BBC iPlayer* (*BBC*, 2020), which was also considered during the preparation of the current questionnaire to determine whether users consume such content and their opinion regarding its accessibility.

1.3. Accessibility services on the *BBC*

1.3.1. Subtitling

Subtitling consists of presenting, generally at the bottom of the screen, written text that includes the spoken dialog and elements describing parts of the image (graffiti, captions, etc.) or the soundtrack (songs, voice-overs, etc.) (**Díaz-Cintas**, 2020). In general, subtitles should appear in sync with the image and dialog and must remain on screen long enough to be read (**Díaz-Cintas; Remael**, 2014). The exception is live programs, where the subtitler must repeat the speech into a microphone connected to a voice recognition application and subtitling program, thus subtitles are usually shown with a delay (**Díaz-Cintas**, 2020).

Subtitling for deaf people has specific characteristics. It is usually intralinguistic, i.e., with the dialog and subtitles in the same language (**Bartoll**, 2004), and closed, that is, activated or deactivated by the user. In addition to the spoken dialog, it should also contain other essential elements so that deaf people can follow the plot in the same way as hearing people. Indeed, these are some sounds that are not part of the dialog but are necessary to follow the plot. It is also necessary to identify which character is speaking at each moment by using colors, tags, or hyphens (**Ivarsson; Carroll**, 1998). Ultimately, this type of subtitling consists of “making sound visible” (**Neves**, 2008, p. 177).

Subtitling consists of presenting, generally at the bottom of the screen, written text that includes the spoken dialog plus elements describing elements of the images or soundtrack

Furthermore, a wide and varied audience benefits from this service. For example, intralinguistic subtitling has great educational potential and is used by many people with limited knowledge of the language (**Díaz-Cintas**, 2003). Likewise, it is also useful for the treatment of dyslexia in childhood (**Mowlaie; Yargholi**, 2021).

The *BBC* was the pioneer in offering subtitled programming. On 14 August 1938, the German film *Der student von Prag* was broadcast in its original version with English subtitles. According to researchers such as **Ivarsson** and **Carroll** (1998) or **Giles** (1997), this was the first subtitled television broadcast in the world. However, closed captions, which can be activated and deactivated by the user, would not arrive until 1980, after the introduction of the teletext service (*Ceefax*). It was then that they were officially introduced onto television (**Ivarsson; Carroll**, 1998). This service started out as occasional, but as early as 1984, the *BBC* began to provide data on the weekly hours or percentage of programming with subtitles, confirming it as a regular service on British television. Since then, the *BBC* has increased both the number of channels and the percentage of captioning, reaching 100% in 2008.

1.3.2. Audio description

Audio description is an intersemiotic translation modality used to make theater, movies, television programs, and other material accessible to the blind and partially sighted. In programs with audio description, additional narration is provided to describe the action, body language, facial expressions, staging, and costumes. According to **Fryer** (2016), audio description should include who is on stage, where they are located, what they are doing, and how they are doing it. Audio description segments are located between the elements of the dialog so as not to interfere with important sound and musical effects (**Benecke**, 2004).

In general, **López, Kearney, and Hofstädter** (2018) consider that, the greater the visual impairment, the greater the need for this service. In addition, audio description is useful for people who experience difficulties in the recognition of emotions (**Starr; Braun**, 2020) and for learning, as in children’s programs (**Palomo-López**, 2010). This service can also help people with learning disabilities follow the plot, although audio description designed for people with visual impairment may be insufficient to achieve full understanding (**Franco; Medina-Silveira; Dos-Santos-Carneiro**, 2015).

It seems that its evolution as a standardized accessibility service began in the 1980s in various European theaters then jumped to other fields such as film or television. In the mid-1980s, the first theatrical performances with audio description began in Europe. Specifically, it is considered that the first took place at the *Robin Hood Theater* in Averham, UK, in turn inspiring the *Theater Royal Windsor* to introduce this service in 1988 (**Orero**, 2007). More recent studies have even suggested that the first theatrical performance with audio description took place in the UK in 1917 (**Fryer**, 2016).

Coming from theater and cinema, audio description reached British television in the 1990s with the *Audetel* project (1992–1994). The first trials of audio description of programming occurred in 1994 at the *BBC* with this *Audetel* technology, which is transmitted along with analog

In programs with audio description, additional narration is provided to describe the action, body language, facial expressions, staging, and costumes

television to specific receivers. However, that project ended when the *Broadcasting act* (1996) determined that audio description should be sent via DTT. DTT audio description tests began in 2000, although the service reached few people initially because it required compatible receivers (Greening; Rolph, 2007).

1.3.3. Sign language

Sign languages are the natural languages of deaf people and the main feature of deaf identity and culture (Kyle; Woll, 1985; Napier; Leeson, 2015). Their main distinguishing feature is that, instead of being transmitted through the vocal-auditory channel, they rely on a visual-gestural channel (Deuchar, 1984). Signers use their hands, arms, torso, face, and head, as well as space and facial expression (Stone; Köhring, 2021). The sign language considered herein is *British sign language* (BSL), recognized as a language by the British government in 2003. Unlike subtitling and audio description, sign language is not only an audiovisual accessibility service but also a natural language used by deaf people worldwide.

However, its implementation on television has been much more restricted compared with subtitling (Napier; Leeson, 2015). According to Stone (2007), this is because the implementation of accessibility services is driven by a legal obligation rather than the initiative or will of corporations. This would explain the scarce implementation of signing with respect to subtitling, since the legal obligation for the BBC is 100% for subtitling but only 5% for sign language. Kurz (2004) adds that operators prefer subtitling because it has a lower cost and the target audience is larger than for sign language.

Regarding its evolution on television, Neves (2007) suggests that it may have started in the early 1980s in the UK and USA. In the UK, the first program with sign language aired in the 1950s on the BBC, called *For deaf children*, followed in the middle of the 1960s by another program called *Vision on*. A few years later, in 1979, *Signs of life* began to be broadcast, followed in 1981 by *See hear*, a news magazine about the deaf community that is still broadcast today on BBC Two (Stone, 2007). Later, the enactment of the *Broadcasting act*, in 1996, and the *Communications act*, in 2003, brought sign language to the other channels, albeit with much lower fractions than for subtitling.

2. Method

For this descriptive study, an online survey was applied as a quantitative method. This approach can increase the level of response and allows one to reach a geographically dispersed population that is difficult to access such as people with visual or hearing impairment (McDaniel; Gates, 2005; Schonlau; Fricker; Elliott, 2002). We used the *SurveyMonkey* platform, which allows accessible surveys to be answered without a mouse or keyboard by using voice commands and control software, a screen reader with a text-to-speech system, or a screen magnifying glass.

To increase the response rate, a short and simple survey including only questions pertinent to the research in a logical order was prepared (Cea-D'Ancona, 2012). Although the main study method is quantitative, open questions were included in the questionnaire to make the instrument more useful for collecting qualitative data (Braun *et al.*, 2020).

The questionnaire was divided into several study dimensions, one for each accessibility service. Logical options were applied to create filters at the beginning of each block. In a mandatory question, respondents were asked whether they used subtitling, audio description, or sign language, so that the blocks with corresponding questions were only displayed to those who answered affirmatively (Sánchez-Carrión; Segovia-Guisado; Sánchez-Meseguer, 2012).

In the block on each accessibility service, user satisfaction with its quantitative and qualitative aspects was queried. The quantitative variables were the same in each case:

- The amount of accessible programming
- The variety of programming that includes the service
- Its scheduling.

Regarding the qualitative aspects, we included questions based on the *Ofcom Guidelines on the provision of television access services* (2021b), which establishes the format and characteristics of accessibility services. Likewise, the aspects of subtitling, audio description, and sign language included in the questionnaire coincide with those considered to be relevant by researchers and users in previous reports (Bosch-Baliarda; Soler-Vilageliu; Orero, 2020; Gil-Sabroso; Utray, 2016; Perego, 2018; Souto-Rico, 2021). Finally, the characteristics of the BBC's accessibility services were also considered (a complete list of variables is shown in the questionnaire and the "Results" section). In both the quantitative and qualitative questions, a Likert scale was used with five options plus "don't know/no answer." In addition, for the questions about the subtitling and sign language formats, images were included to facilitate the answer.

Respondents were also asked about their satisfaction with the accessibility of linear and on-demand broadcasting on the *BBC iPlayer*, given the boom in the consumption of on-demand audiovisual content. Finally, they were asked to evaluate each accessibility service on a scale from 0 to 10. The questionnaire ended with an open question regarding changes or improvements to be introduced in the accessibility services. This open question allowed respondents to add additional, unanticipated issues and capture the most important ones for users (Cea-D'Ancona, 2012). The questionnaire can be consulted on *Figshare* via the following DOI:

<https://doi.org/10.6084/m9.figshare.16611343>

The survey comprised 29 questions. Its completion time was estimated to be 10 min by *SurveyMonkey*, half the maximum established for online surveys (Sánchez-Carrión; Segovia-Guisado; Sánchez-Meseguer, 2012). The evaluation system on the *SurveyMonkey* platform rated the questionnaire as “perfect,” indicating that the number, form, and variety of questions, as well as the time required to complete it, were adequate. In fact, the platform predicted a 73% average completion rate for the survey, which was in fact exceeded, reaching 83%. This figure confirms both that the questionnaire was properly formulated and the interest of the people surveyed, thus supporting the relevance of the method.

The survey was distributed with the assistance of 26 charities for people with visual or hearing impairment throughout the UK, including in particular the *British Deaf Association (BDA)* and the *Royal Association for Deaf People (RAD)*. These charities distributed the survey among their members and via their social media accounts, thereby ensuring that the questionnaire reached people using the accessibility services on British television.

Finally, the questionnaire was reviewed by academic experts in the survey method: Cea-D’Ancona (2004; 2012) and Segovia-Guisado (Sánchez-Carrión; Segovia-Guisado; Sánchez-Meseguer, 2012). In addition, from the charity movement, it was endorsed by the *Royal Association for Deaf People (RAD)* and, specifically by Amanda Casson-Webb, an expert in accessibility and its director of communication services.

All participants gave informed consent before participation in the survey. To facilitate participation, the questionnaire was anonymous with only data on sex, year of birth, and disability collected, thus preventing the identification of the participants. In total, we collected 442 responses. Of these participants:

- 119 (26.92%) were men;
- 321 (72.62%) were women;
- 2 (0.45%) chose the option “other,” further specifying “asexual” and “nonbinary trans.”

By age bracket:

- 2% were children from 0 to 12 years old;
- 2.3% were between 13 and 17 years old;
- 22.3% were aged from 18 to 39 years;
- 53.2% were in the age range from 40 to 64 years;
- 20.2% were 65 years or older.

By type of disability:

- 14.9% of the respondents had visual impairment;
- 56.1% had hearing impairment
- 2.3% stated that they had both disabilities (visual and hearing);
- 23.1% indicated they did not have a disability;
- 3.6% reported another disability.

Considering that a large majority (76.9%) of the surveyed participants had a disability, that the questionnaire was distributed through charities for people with visual or hearing impairment, and that some of the participants without disabilities stated that they were relatives, we decided to include all the responses received. In addition, although designed mainly for people with visual or hearing impairment, accessibility services are useful to a wide population, and some authors even argue that they are useful for all audiences (Agulló; Matamala; Orero, 2018). Next, we present the results of the surveys, organized by accessibility service.

3. Resultados

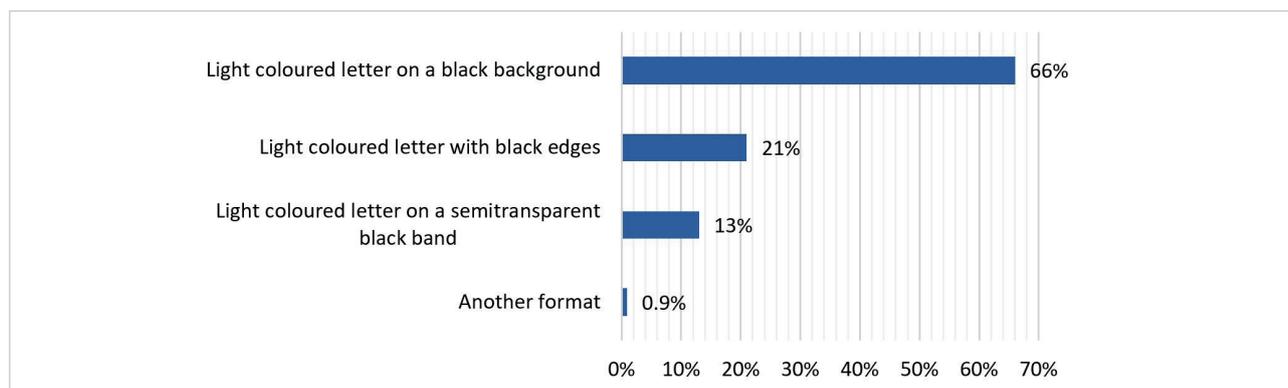
3. Results

3.1. Subtitling

Among survey respondents, 84.2% ($n = 372$) said they use the subtitling service to watch *BBC* content. This question served as a filter, so those who responded to the questions about subtitling were those who claimed to use this accessibility service.

As this accessibility service is visual and useful for a large number and variety of users, the format in which it is presented, specifically the font and contrast against the background, are relevant regarding its readability. The *Tiresias Screenfont* typeface is used on digital television in the UK. To make it easier to read, shading or outlines are added to the letters, or a gray or black box is inserted behind to increase the contrast between the text and background colors (Zárate, 2021). Given that different formats are used depending on the television channel, platform, and country, the first question in this block referred to the format in which the subtitles are presented on screen. Respondents were given three options, with corresponding images to facilitate understanding of the question, while leaving open the possibility that they could propose another subtitling

“ The main demands from users are to improve the quality of live subtitles, reduce spelling errors, and ensure that subtitles are correctly positioned so as not to cover important elements on screen ”



Graph 1. Subtitle format preferences

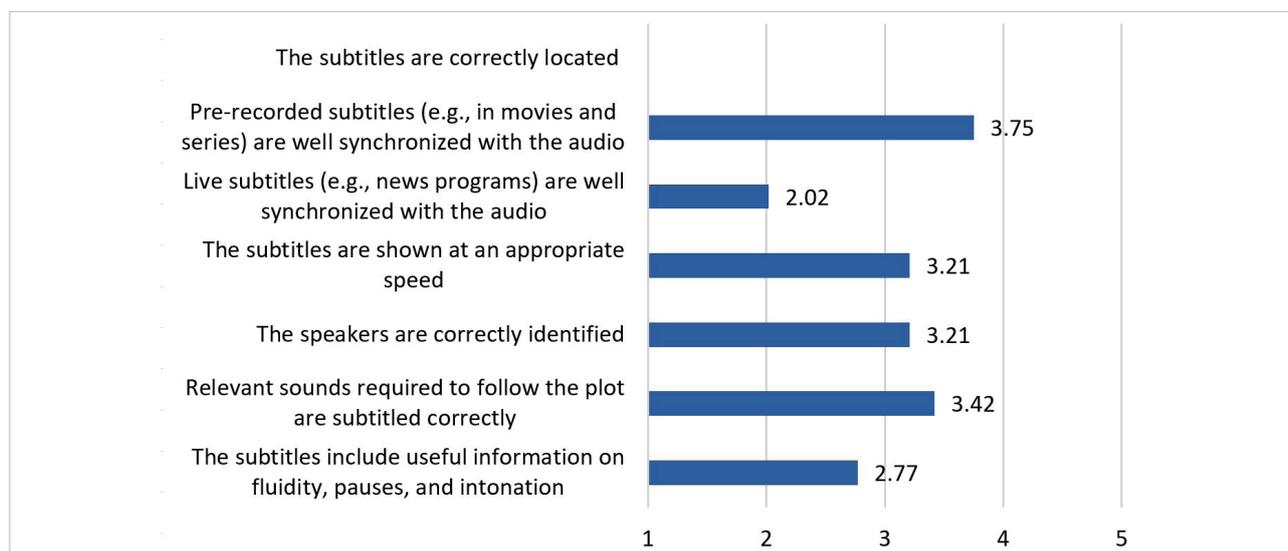
format if preferred. The results show that a vast majority prefer the “light colored letter on a black background” format, which offers greater contrast and is the one used by the BBC.

Regarding the qualitative aspects of subtitling, the variables included in the questionnaire were selected from *Ofcom’s Guidelines on the provision of television access services* (2021b). They coincide with those identified by **Souto-Rico** (2021) and **Zárte** (2021), among others, as relevant for content monitoring and important for users. These variables include technical aspects such as the position of the subtitles (which should not obstruct other elements on screen), an appropriate speed for reading, the use of colors or other techniques to identify who is speaking, and their synchronization, distinguishing between pre-recorded and live subtitles. These are accompanied by aspects of the content, such as the subtitling of sound effects and suprasegmental information. These are typical elements of subtitling for deaf people and are required to guarantee that all the sound information needed to follow the program is provided (**Neves**, 2008).

The answers were provided on a Likert scale with five options (from “strongly disagree” to “totally agree”). To measure the results, a value from 1 to 5 was assigned to each of the five response options, with “strongly disagree” corresponding to the lowest value (1) and “totally agree” to the highest (5). In this way, it is possible to calculate a weighted average of the responses and carry out the assessment in the form of a score.

As seen in Graph 2, while the synchronization of pre-recorded subtitles received the highest score (3.75), the synchronization of live subtitles obtained the lowest (2.02). The differences inherent to the live and pre-recorded subtitling processes explain this marked discrepancy. The position and speed of subtitles, character identification, and sound effects scored similarly and above 3, which can be considered the pass level as the middle option. On the other hand, the final variable on suprasegmental elements such as pauses or intonation did not reach this threshold, being the second worst aspect (2.77) after synchronization of live subtitles.

Regarding the subtitling of programs broadcast online either live or on demand on the *BBC iPlayer*, the responses revealed the same format and characteristics as for traditional television. The most interesting result in this case from the users’ point of view is whether they used subtitled content or not. In the case of live online programs, 66.16% stated that they used this content with subtitles on the *BBC iPlayer*. Meanwhile, the percentage who stated that they watched subtitled BBC programs on demand was even higher, reaching 82.07%.



Graph 2. Average agreement with statements about subtitling

It is just as interesting to identify the reasons why such online content was not viewed. The most common reason stated was a preference for watching content on traditional television, mainly because it is more comfortable to use a larger screen than a computer, tablet, or smartphone. Other respondents stated they did not watch such content with subtitles because they did not know this possibility existed, they did not know how to activate them, or they access on-demand content via other platforms such as *Sky* rather than the *BBC iPlayer*, where they do not find subtitles available on demand. Finally, the reasons for not watching online content include a lack of time or the necessary technology.

“ One criticism from respondents was that the audio description revealed what was going to happen beforehand, thus spoiling the plot or the suspense ”

To conclude this block, we asked for a general assessment of the *BBC* subtitles on a scale from 0 to 10, obtaining a value of 7.45. Finally, an open question encouraged respondents to state changes or improvements they consider necessary regarding subtitling on the *BBC*. Of the 304 responses obtained, more than 100 asked for an improvement in the subtitling of live programs, focusing on three main aspects: improving synchronization, reducing spelling errors, and careful positioning of subtitles so as not to cover other elements such as the face or mouth of the speaker. Other questions about live subtitles revealed by the survey relate to the need to correct them for reproduction on demand, while several respondents complained that attempts to correct grammatical errors resulted in the loss of a lot of information. Other demands were related to the format of the subtitles, with suggestions to increase their size and contrast against the background, make them customizable, or place them on a darker box if requested.

3.2. Audio description

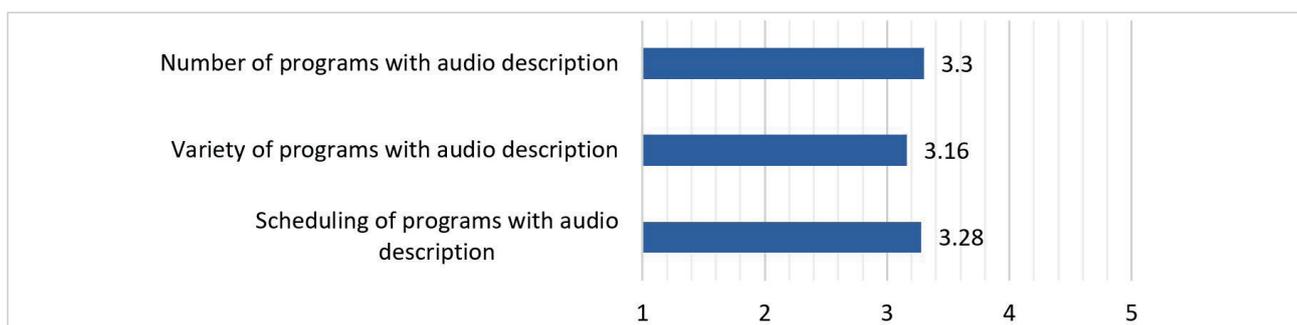
In the case of audio description, 20.85% ($n = 83$) of respondents stated that they used this service in the filter question and so answered the questions about this service in the survey. The large difference between the number of respondents using subtitling versus audio description is because the former is generally the most widespread and most used accessibility service, while audio description and sign language are used by a much smaller number of users.

Given that the *BBC* offers audio description for around 32% of its programming, we asked the respondents about their satisfaction with the quantity, variety, and scheduling of programs with audio description, obtaining the results shown in Graph 3. As can be seen, again on a Likert scale of five options, all exceed the middle threshold, although a certain level of improvement is perceived in the responses of the respondents. Among the five options, in all cases, the least selected was “very dissatisfied,” corresponding to the lowest score, while the most selected was “somewhat satisfied”, corresponding to a value of 4 out of 5.

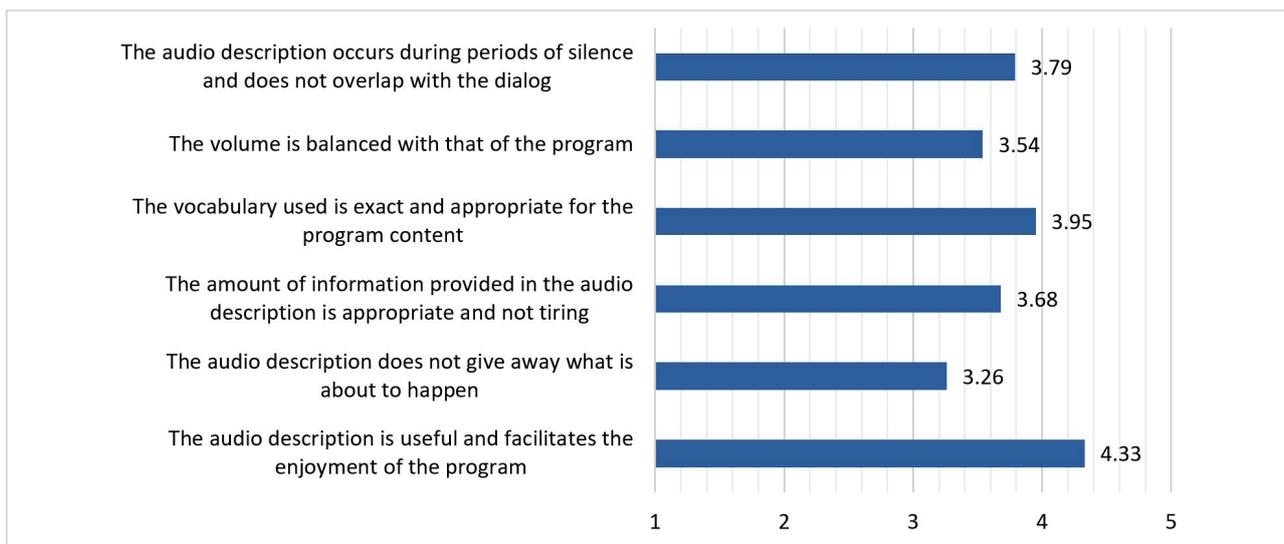
Regarding audio description, the qualitative aspects included in the questionnaire were again based on the *Ofcom* (2021b) guidelines and those highlighted in the scientific literature (**Perego, 2018**). This includes the synchronization of the audio description segments, their insertion during periods of silence, that the volume is adequate, and that event anticipation does not spoil the suspense. Likewise, it was considered relevant to ask the opinion of the recipients regarding the amount of information in the audio description and its match to the content. This is because various publications have warned of the difficulty of achieving a balance such that the amount of information is sufficient but not excessive, which can tire and irritate users (**Vercauteren, 2007**).

In the survey, the variable with the best score was the general usefulness of the service to facilitate enjoyment of the programs (4.33). In contrast, the aspect receiving the worst score was event anticipation (3.26). This means that respondents consider that the audio description reveals what is going to happen beforehand, thus spoiling the plot or suspense. In general, all the aspects reached the middle score of 3, although only one achieved 4 out of 5.

Regarding on-demand content online, 68.75% stated that they viewed it with audio description, while 31.43% responded negatively. Again, in a context of increasing growth of on-demand video, it is interesting to understand why users of audio description on traditional television do not access online content. The reason most commonly stated is the lack of audio description in the programs they want to watch, or that the audio description does not work correctly. These re-



Graph 3. Satisfaction with the quantitative aspects of audio description



Graph 4. Average agreement with statements on qualitative aspects of audio description

asons are followed by not knowing about the possibility of watching the *BBC* on demand with audio description, while others stated they did not have (or did not know how to handle) the necessary technology.

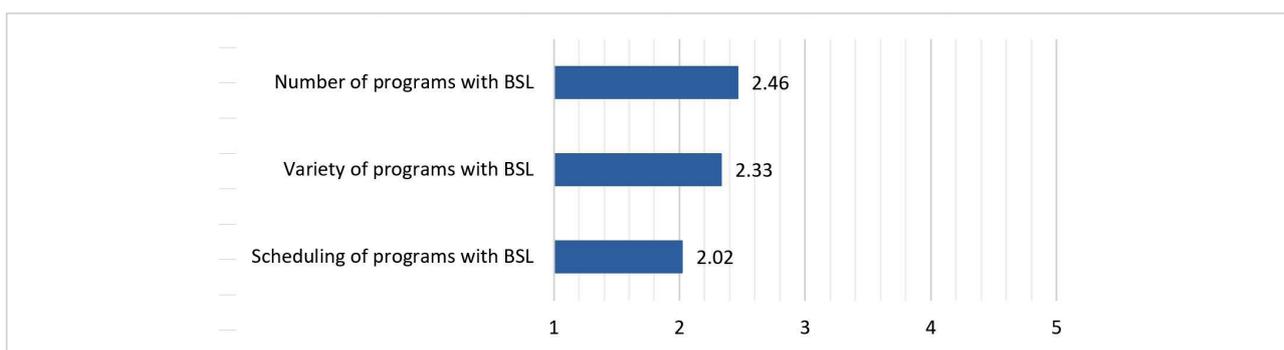
As in the case of subtitling, the block on audio description ended with a closed question for a general assessment of this service on a scale from 0 to 10, and an open question by which respondents could include proposals for improvement. Audio description on the *BBC* received an average score of 8. In the case of improvements, unlike subtitling where respondents focused on qualitative aspects, in this case they mainly demanded more programs with audio description, on both linear and on-demand television. They also demanded a greater variety of programs with audio description and that this service be applied to programs such as news, quiz shows, and sports broadcasts. Regarding the qualitative variables, the respondents highlighted the need to be able to vary the volume of the audio description, that more information be audio described and in more detail, that events not be anticipated, that a greater variety of voices be included and that these be appropriate to the program, and that the volume of the program be decreased during the audio description segments.

Regarding audio description and sign language, users mainly demand a great amount of accessible programming, on both traditional as well as on-demand television

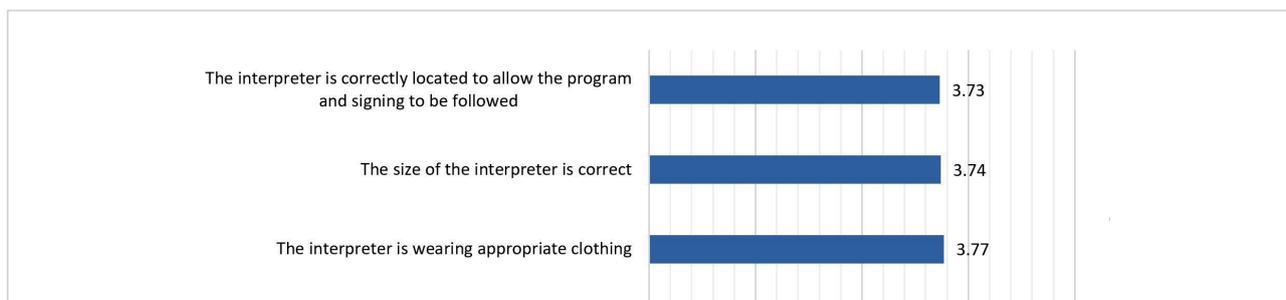
3.3. Sign language

Of the people surveyed, 17.6% ($n = 67$) stated that they watched television with sign language and thus saw and answered the questions in this block. As in the case of subtitling, here we also asked respondents for their preferred format for including the sign language interpreter on screen, with three answer options, each with an image to facilitate understanding of the question. Of those surveyed, 90.31% preferred the silhouette format, which is the one used by the *BBC*, with only 8.06% preferring to see the interpreter inside a window. The silhouette format consists of reducing the size of the main screen and adding a margin at the bottom and right sides. The figure of the interpreter is then included on the right, allowing a larger size, since it is not limited by the edges of the window.

The quantitative aspects of quantity, variety, and scheduling of the signed programs obtained relatively low scores, especially the last one. This is because, unlike subtitling and audio description, signing cannot be activated and deactivated in



Graph 5. Satisfaction with the quantitative aspects of sign language



Graph 6. Average agreement with qualitative statements regarding BSL

linear television, which forces all users to see the figure of the interpreter on screen, causing rejection by those who do not need this service. This means that programs with sign language are sometimes broadcast in the early hours or when audiences are low, or first without sign language and then again at dawn with BSL signing. In fact, when asked whether they would like the image of the interpreter to be activatable, as with the other services, 92.06% of users answered affirmatively.

The survey variables describing the qualitative aspects were selected based on the *Ofcom* (2021b) standard, as well as literature showing that users attach great importance to aspects such as the format, position, and size of the on-screen interpreter as well as the color contrast to guarantee the visibility and understanding of sign language (Bosch-Baliarda; Soler-Vilageliu; Orero, 2020; Gil-Sabroso; Utray, 2016). The aspects surveyed also included an assessment of the signed content, another issue of concern to users (Bosch-Baliarda; Orero; Soler-Vilageliu, 2020).

Paradoxically, in this case, better scores were obtained than for the amount of signed programming, although the average satisfaction of the respondents indicates the possibility for improvement. Furthermore, as seen in Graph 6, all the included variables obtained very similar scores.

Regarding online broadcasts, 50.79% stated they watch content on the *BBC iPlayer* with sign language in live broadcasts, while 60.32% stated that they use it on demand. The reasons why respondents did not use this option are similar to those given by the users of other accessibility services: the small size of smartphone, tablet, or computer screens, and not knowing about this possibility or how to use it. Further arguments included that the schedule was not appropriate or that programs with sign language were scarce.

Finally, on a scale from 0 to 10, sign language on the *BBC* obtained an average score of 6.57 in our survey. In the final question, asking users for proposals for improvement, the most commonly repeated responses were related to quantitative aspects, i.e., the quantity, variety, and scheduling of signed programs. In general, respondents asked for more signed programs, with greater variety, including children's and news programs, and that these programs be broadcast at more accessible times. Further requests included the presence of signed content on more channels, that the signing be clearer, or that the interpreters be bilingual. The final proposals for improvement were that users' suggestions be listened to and that signed programs remain available on demand for longer.

4. Discussion and conclusions

Comparing the data provided by the *BBC* (2020) in its latest reports with the accessibility requirements from *Ofcom* (2021a), we see that British public television achieves compliance in all cases. However, such compliance with the legal requirements or *Ofcom's* guidelines on subtitling, audio description, and signing does not necessarily imply full satisfaction on the part of the visually or hearing impaired audience. This descriptive study explores the opinion of users through a survey that asked about their satisfaction with the quantity and quality of accessibility services on the *BBC* as well as proposals for improvement, thus addressing the call from charities that users themselves evaluate these services.

Firstly, we identified a notable difference between subtitling, which is available across all content, and audio description and sign language, with much lower fractions. This is clearly reflected in the survey responses. Indeed, in the case of subtitling, the demands of the respondents are linked to the quality of the service. In fact, the issue of greatest concern and with the worst score on the questionnaire is the subtitling of live programs.

Respeaking is the most widely used system for live subtitling (Romero-Fresco, 2020). In this system, the subtitler repeats the speech, including punctuation marks and some characteristics specific to deaf users, into a microphone connected to a voice recognition application and a subtitling program, which then displays the subtitles on screen after the shortest possible delay (Díaz-Cintas, 2020). The *BBC* uses respeaking and stenotyping to subtitle such content and displays the result on screen word for word, instead of in blocks. This reduces the delay but requires more attention from the user, leaving little time to view the images (Romero-Fresco, 2012). In academia, research continues

“ Subtitling is the most widely used accessibility service, while audio description and sign language are used by a much smaller number of users ”

to identify tools that can reduce the delay and improve the quality of live subtitles. This is the case of the automatic translation system *ELITR* (Bojar *et al.*, 2021) or *Deep-Sync*, a semantic-aware speech recognition tool that successfully aligns most subtitles even when there is no direct correspondence between the respeaker and the audio content (Martín *et al.*, 2021).

Another subtitling issue that was highlighted is the demand that the service be personalizable according to user needs. This is not a new question in the scientific literature. In this regard, authors such as Ivarsson and Carroll (1998) or Gottlieb (1997) already mentioned at the end of the last century the possibility of offering different types of subtitling so that users could choose the one best suiting their needs. Currently, the HBBTV option in smart TVs enables the customization of the size or speed of subtitling, but this issue is not addressed by broadcasters and has become the remit of device manufacturers.

For audio description, unlike subtitling, although the respondents mentioned certain aspects related to quality such as using a suitable volume level, most of their demands related to increasing the quantity and variety of programs with audio description. Some respondents requested that audio description be included in news programs. Although audio description is available for live events such as inaugurations, congress openings, and sports events, the scientific literature warns of the difficulty of adding audio description to any type of live programming. This is because, to include audio description in a program, it must first be viewed to identify spaces without dialog that would be available to insert description segments, and to analyze the information that should be described (Benecke, 2004; Fryer, 2018). One plausible option could be the creation of good practice guides for journalists and television presenters, including which elements should be described to make the content accessible to people with visual impairment.

A noteworthy difference is also observed between the implementation of the two accessibility services for people with hearing impairment. While subtitling is present on all BBC programming, sign language reaches around 6% (BBC, 2020). This is especially noteworthy because, in addition to an accessibility service, sign language is the language of the deaf community, and its inclusion on television is linked to the representation of cultural diversity. On the one hand, this could be linked to the comments by Stone (2007) that television stations include this service because of a legal obligation rather than of their own free will. On the other hand, within the legal obligations, there is a clear difference between the 100% requirement for subtitling versus 5% for sign language (Ofcom, 2021a), an issue that is also linked to the fact that subtitling is a service aimed at a wider audience. In fact, of the 11 million people with hearing loss in the UK, only 151,000 are BSL users. In addition, the BBC itself links this to the fact that sign language interpretation cannot be activated or deactivated by the user. This forces it to be broadcast openly, since it is received by all users, which causes rejection by those who prefer to watch programs without an interpreter on screen. For this reason, in our survey, more than 92% of users stated that they would like the image with the BSL interpreter to be able to be activated and deactivated, as is done with the other services. Again, as in the case of audio description, this possibility could be offered by the HBBTV system of smart TVs, although this would then be available only to those with internet-connected televisions rather than all users.

Finally, we highlight the reasons why respondents do not consume content with accessibility services online. The most important reasons include the smaller screens of tablets or smartphones, thereby also reducing the size of the subtitles or sign language interpreter, although multiple participants stated that they did not know about this possibility or how to use it. Here, two relevant questions emerge. On the one hand, this indicates the need for broadcasters to reach out to audiences to inform them that such content is available. To achieve this, it would be very interesting to include charities, as done in the current study to distribute the survey. On the other hand, this highlights the need to continue advancing the digital literacy of people with disabilities so that they can use audiovisual communication services on demand in the same conditions as the rest of society. In addition, it is essential that regulations on the obligation to make content accessible be extended to other forms of audiovisual consumption, either linear or on demand (Bolaños-García-Escribano; Díaz-Cintas; Massidda, 2021).

In conclusion, this study highlights the level of satisfaction of users with subtitling, audio description, and sign language on the BBC and captures their main demands, thus providing very valuable information for both the broadcaster itself as well as the regulatory bodies. We consider that our initial hypothesis is confirmed, especially regarding certain aspects such as the quantity, variety, and scheduling of signed programming. A clear discrepancy appears between the minimum requirements and the demands of the audience. Indeed, demands for more scheduled programming have been made before (Bosch-Baliarda; Soler-Vilageliu; Orero, 2020) and are again supported herein, yet the provision by British public television remains barely above the minimum requirement. This study also confirms other results of previous studies, e.g., that delays in live subtit-

Signing cannot be activated and deactivated in linear television. Its inclusion causes rejection by users who do not need this service, resulting in programs with sign language being inserted at off-peak viewing times

It is essential to advance the digital literacy of people with disabilities so that they can use on-demand audiovisual services on the same basis as the rest of society

ling continue to annoy users. It also provides new conclusions, including in particular the need to incorporate such services into on-demand content and to reach out to users so they can access it. Likewise, it is necessary to implement solutions so that sign language is optional and can be activated and deactivated, like the other services. In future research, it would be interesting to apply methods based on focus groups formed of representatives from charities, regulators, and broadcasters, to identify ways to address the demands made by the respondents.

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