

The reception of subtitling for the deaf and hard-of-hearing in Spanish TV news programs

Recepción de la subtítulos para personas sordas de los informativos españoles

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The current paper presents a study on the subtitling for the deaf and hard-of-hearing (SDH) in Spanish TV news programs (live and semi-live subtitling). The aim of this reception study is to analyze users' comprehension and assessment of live and semi-live SDH. A contemporary corpus comprising items from real news broadcasts was used for the research, and a sample of 52 deaf and hard-of-hearing participants was recruited for the experiment, which was carried out through a variety of virtual and live sessions. The results show that users consider the quality of SDH acceptable and audiovisual comprehension insufficient.

KEYWORDS: Reception, subtitling, SDH, audiovisual communication, accessibility.

Este es un estudio sobre la recepción de la subtítulos para personas sordas (SPS) en directo y semidirecto de informativos españoles. El objetivo es analizar la comprensión y la opinión de usuarios con discapacidad auditiva. Se seleccionó un corpus real y relevante para la investigación y se reclutó una muestra de 52 sujetos con discapacidad auditiva para la realización del experimento, que se llevó a cabo en sesiones presenciales y virtuales. Se encontró que, aunque los usuarios consideren aceptable la calidad de los subtítulos, los resultados reflejan que la comprensión es insuficiente.

PALABRAS CLAVE: Recepción, subtítulos, SPS, comunicación audiovisual, accesibilidad.

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INTRODUCTION

Live and semi-live SDH

Subtitling for the deaf and hard of hearing (SDH) burst onto television in the 1970s in the United States, and in the 1990s in Spain (Díaz-Cintas, 2010; Ivarsson & Carroll, 1998), and its practice and study have evolved and adapted to the social, technological and legislative changes that govern the discipline (for a review of the history of SDH, see Díaz-Cintas, 2010 and Pereira, 2005). Live SDH took somewhat longer to arrive –it began in 1982 in the United States and the United Kingdom– and the most widespread current technique for live SDH, *respeaking*, was not tried until 1999 (see Romero-Fresco, 2018 for an in-depth historical review of live SDH).

Many authors have defined and characterized SDH as a mode of translation and accessibility (Díaz-Cintas, 2006; Pereira, 2005, among others), and in general terms it might be said that SDH today involves the addition of on-screen text that reflects dialogues and narration, identifies characters, and provides contextual and paralinguistic information, plus indications of sound effects, music and songs (for a more extensive characterization of SDH, see Tamayo, 2015).

In the corpus under study here, we address the television genre of newscasts. These are self-produced programs with intralinguistic SDH in Spanish whose subtitles are broadcast live or semi-live, depending on the subgenre (news, headline, live, news chronicle, background) (De los Reyes et al., 2020; Marín, 2017). In this contribution we understand “live subtitling” to be the “subtitling of live programs or recorded programs that were not available early enough to prepare the subtitles prior to their broadcast”⁴ (Asociación Española de Normalización y Certificación [AENOR], p. 7). Similarly, semi-live subtitling is that which is “produced before a program is broadcast, but synchronized during its transmission” (AENOR, 2012, p. 7).

Although there are several ways to produce live subtitling, *respeaking* (Eugeni, 2009; Lambourne, 2006; Romero-Fresco, 2011, 2018) is the most common technique today. There is little doubt that the quality of

4 All translations from Spanish are our own.

SDH is directly proportional to the time available to generate it (Izard, 2001). However, respeaking and other live subtitling systems have evolved significantly over the last two decades. With this technique, the respeaker, while listening to the live audio, dictates the subtitles to a speech recognition program which converts them into written text, edits them where necessary, and uploads them for playback on screen. The respeaker has to take into account that he or she must, among other things, dictate to the program what color the subtitles should be in, indicate any orthographic signs necessary, and synthesize information so that it conforms to the reading speed conventions required by the SDH. This inevitably means that live and semi-live subtitles may appear with some orthographic and orthotypographic errors, as well as with room for improvement in the application of conventions, such as the segmentation or synchronization of the subtitle with the audio to which it corresponds.

Although there are many parameters that must be taken into account in generating a SDH (Arnáiz, 2012) and for it to fulfil its communicative function, two key concepts can be seen as measures of the quality of live subtitles: subtitle speed (or reading speed) and delay (or lag), both of which are characterized in more detail below.

Subtitle speed and lag

Subtitle speed (also often called reading speed) is the speed at which subtitles appear on screen. It is a “fundamental quality parameter in subtitling, obtained as the quotient between the number of characters that make up the subtitle and the duration of the subtitle” (Martí-Ferriol, 2019, p. 136). It is usually measured in words per minute (WPM) or characters per second (CPS). There is no clear consensus among researchers on the ideal subtitle speed for SDH (see Tamayo, 2015, pp. 79-84 for a review of this issue), since the appropriate speed seems to depend on a variety of elements: the type of product being subtitled and the amount of information transmitted through the auditory and visual channels (Romero-Fresco, 2015); the reading ability, linguistic background and degree of hearing loss of the receivers (Burnham et al., 2008); and the medium in which it is viewed, among others. For this reason, we will take the current UNE standard (AENOR, 2012) as a reference, which establishes a maximum of 15 CPS as a recommendation.

Lag refers to a lack of synchronization. In other words, it is the time that elapses between the audible linguistic code (whether dialogue or narration) and the subtitle that corresponds to that linguistic code. Although in general a quality SDH implies synchrony between subtitle and audible code (linguistic or not), this synchrony is not easy to achieve in live and semi-live programs due to the time needed to prepare, modify or upload subtitles, either by means of respawning or other available techniques. For this variable, the UNE standard (AENOR, 2012) considers a possible lag of up to eight seconds to be acceptable, taking into account the technological resources currently available. Although an eight-second lag may seem too long, with respawning, the most widespread and highest-quality technique thus far developed, it seems difficult to achieve a lag of less than five seconds. This lag is related to the availability of scripts prepared in advance, the technique used, the audiovisual genre and, of course, to any technical problems that might arise (Romero-Fresco & Pedregosa, 2014). When conditions are ideal and scripts are available for the prior preparation of subtitles, the lag can be reduced to around two to four seconds, while in live programs with high speech rates the usual lag is six seconds, but can reach peaks of up to nine or ten seconds of desynchronization (Romero-Fresco & Pedregosa, 2014).

The results of the first phase of the project in which the current study is framed (De los Reyes et al., 2020) showed that live subtitles in news programs usually have a greater lag than semi-live subtitles, and that the latter also usually have a lag in the transitions between live interventions and formats prepared in advance in the running order. It was also shown that semi-live subtitles are generally far more accurate in terms of editing errors, although they have a much higher exposure speed. On the other hand, live subtitling by means of respawning tends to have a slower exposure speed and a higher rate of editing errors.

Reception studies in SDH

In terms of academic work in this area, reception studies based on real SDH (those broadcast in communications media, not prepared for experiments) are somewhat novel, much more so in the case of live SDH reception studies. The history of pre-recorded SDH reception has always

been closely linked to the academic and professional development of this practice (for a comprehensive review of the history of reception studies in pre-recorded and live SDH, see Romero-Fresco, 2018).

Reception studies in SDH began in the 1970s in the United States and intensified in the 1980s with large-scale reception studies on audience preferences and on the educational value of subtitling. By the 1990s, special emphasis had come to be placed on different parameters, especially subtitle speed. It was at this point that studies on SDH also began to proliferate in Europe, especially in the United Kingdom. In the 2000s, eye-tracking studies increased significantly, and the discipline of SDH was consolidated within that of Audiovisual Translation. Two of the most-cited studies from this decade (Jensema et al., 2000a, 2000b) showed, by means of eye-tracking, that the higher the speed of the subtitling, the more time users spend looking at the subtitles and, therefore, the less time they spend looking at the images.

Many of the studies from these first four decades of reception experiments in SDH involved certain limitations that do not allow us to extrapolate or take as definitive some of the conclusions. In the first place, reception studies were carried out in SDH without sound, which allows for the isolation of variables, but which prevents many users from accessing the experimental materials in a way which recreates a real viewing situation, one in which they would use any residual hearing that they might have to complete the audiovisual information. Second, many of the questionnaires and surveys to collect data on the comprehension of SDH or audiovisual content in general did not include questions on the comprehension of visual information, which is indispensable for the overall comprehension of an audiovisual text. Third, many eye-tracking studies have not been supplemented with questionnaires on the comprehension or perception of audiovisual texts, and thus whereas they might be useful to some extent, and notwithstanding the rigor of their data, they tend to ignore a fundamental part of audiovisual text viewing. And, fourth, audience preferences have often been ignored, and questions referring to the enjoyment of audiovisual content have been omitted in favor of questions focusing solely on comprehension.

Although it is true that SDH has audiovisual comprehension as one of its objectives, it is not the only one, and, depending on the audiovisual genre under study, information on audience enjoyment or preferences is key to success in the practice of the discipline. Ofcom (Office of Communications, the UK's broadcasting, telecommunications and postal regulatory authority) has perhaps been the organization that has devoted most effort to collecting data on audience preferences, which it has been able to triangulate with analysis on the understanding of SDH and on its different parameters, generating good practice guidelines in the UK that are a basic reference for all research and practice in pre-recorded or live SDH.

The most recent decade of the current millennium has seen a proliferation of reception studies with much greater rigor, on larger scales, and in many more countries. Perhaps the most notable study in the field has been DTV4ALL (Romero-Fresco, 2015), which analyzed reception in seven European countries and collected data in relation to audience preferences, comprehension, and perception through eye-tracking. Within the part of the DTV4ALL project looking at the Spanish population, Arnáiz (in Romero-Fresco, 2015), for example, includes a questionnaire about media consumption habits and preferences, general opinions about current subtitling and subtitling on different Spanish TV channels, plus preferences in format and conventions (character identification, position, colors, contextual information, subtitle speed, etc.). This European project concluded that users in Spain are relatively happy with the SDH offered, although noting there are aspects that could be improved. In relation to the variables under study in the current research, the project showed that products with a subtitling speed of around 180 WPM do not allow the same amount of time to be devoted to the images, and to infer information from these, as is the case with products subtitled at around 150 WPM, which allow half the time to be devoted to the subtitles and half to the images. Regarding the Spanish part of DTV4ALL in particular, Arnáiz (in Romero-Fresco, 2015) concluded that 75% of the people participating in his study would like the speed of subtitling to be slower in live subtitling.

There are far fewer reception studies available on live SDH. Of particular importance are the surveys conducted by CESyA (Centro

Español de Subtitulado y Audiodescripción, Spanish Subtitling and Audio Description Centre) in Spain, and Ofcom in the UK, especially in relation to concerns relating to quality. These surveys, however, do not corroborate users' opinions with reception studies on comprehension (Romero-Fresco, 2018). Regarding the variables in the present study, reception studies in recent years point to the fact that excessive subtitling speed can impede correct comprehension (Romero-Fresco, 2010, 2011, 2012) and that users prefer synchronized subtitles, even if this is to the detriment of accuracy and might imply more errors (Muller, 2015).

MATERIALS AND METHOD

In this contribution we present a reception study, the main objective of which was to analyze the reaction of hearing-impaired people to real news programs broadcast with live and semi-live SDH, looking specifically at the impact of subtitle speed and lag on the comprehension of the audiovisual message and on the perception of quality. For this, a sample of subjects with different types and degrees of hearing impairment agreed to watch a representative selection of news items that comprise the study corpus (De los Reyes et al., 2020), in which both subtitle speed and lag presented clearly different values. Participants were asked to answer a questionnaire on the audiovisual information of the clips they had seen, as well as to express their opinion on the quality of the subtitles.

Design and variables

According to Rojo's classification (2013, p. 134), this experiment is of a pre-experimental type and has a case study using a single measurement. Data collection is based on survey methodology and adopts a mixed technique in terms of data analysis, in which open-ended and closed-ended data are combined (Creswell & Creswell, 2018). Two independent variables were established: on the one hand, the exposure speed of the subtitles, according to the parameters established in the UNE standard (AENOR, 2012), which sets a maximum of 15 CPS per subtitle; and on the other, the delay or lag in the appearance of the subtitles with respect to the limit established by the UNE standard, eight seconds, in order to see

whether the increase in these amounts interferes with comprehension. The hypothesis is that these two independent variables will influence the dependent variables, that is, the comprehension and evaluation of the audiovisual content. To this end, the following hypotheses were formulated:

1. The high speeds and lags of live and semi-live subtitles of newscasts will not allow for the comprehension of the message.
2. Users will be of the opinion that subtitles with high speeds and lags are not conducive to good quality.⁵

Participants and development

Data collection was carried out during the months of October and December 2019 through a bespoke platform hosted on the research project website.⁶ With a view to guaranteeing controlled responses, the experiment was not disseminated through digital media of any kind and those who agreed to participate did so in person or telematically at the times previously established by the research team, thus forming a convenience sample by population.

Experimental studies involving people with some type of disability usually present difficulties in obtaining population-based samples (Orero et al., 2018, p. 112). For this reason we sought the help of associations and groups of people with deafness from which it would be easier to select participants. Specifically, we contacted about twenty associations from around the country in order to carry out the study, in-person or virtually. From these, we received positive responses from the Association of Families and Deaf People of the Province of Castellón, the Association of Cochlear Implant Patients of the Region of Valencia, the Valencian Association of the Deaf, the Canary Islands Independent Deaf People Group, as well as the services responsible for

⁵ The numerical values of the independent variables used to evaluate the quality of the subtitles are those recommended by the UNE standard (AENOR, 2012), as specified in this section.

⁶ See <http://www.itaca.uji.es>

the integration of people with disabilities at the universities of Valencia and Jaume I in Castellón.

After making the necessary appointments, different data collection sessions were organized in groups of between five and 15 people per session. The duration of each session was approximately half an hour, in line with expert recommendations (Brancato et al., 2006, p. 50).

A total of 52 subjects participated, a sample that seems sufficient for the objectives of the study, according to the parameters established in previous research (Hennink et al., 2016; Orero et al., 2018). Demographic data reveal that the mean age of the sample was 47.7 years, with the gender distribution being 68% female and 32% male. With regard to education, 29% had completed primary education, 14% secondary education, and 10% Baccalaureate or COU (the precursor of the Baccalaureate in Spain); a further 25% had completed university studies (undergraduate or postgraduate), while 22% had vocational training.

In terms of degree of hearing impairment, the majority of participants were divided between those with a “severe/advanced/50-95%” impairment (37.8%) and those with a “profound/total/90-100%” impairment (33.9%), while those with a “moderate/medium/25-49%” degree represented 18.8% of respondents. On the other hand, subjects diagnosed with cophosis (total deafness) and those with a “mild/light/5-24%” disability amounted to 3.8% and 5.7%, respectively. It should also be noted that 43.4% of participants selected Spanish sign language as their natural language of communication. These data corroborate the fact that the subject sample is a sufficiently heterogeneous one, reflecting the real situation of the community of people with hearing impairment, which allows us to draw conclusions within the framework of our study.

In compliance with legislation currently in force, the anonymity of the participants, as well as the confidentiality of the data, were guaranteed by the procedures established for data treatment, and ultimately by the obligation of secrecy and protection to which those persons with access to the data are subject, which in no case will be used or disseminated on an individual basis. All participants were duly informed of the process, and authorized the use of the information received by the research team.

MATERIALS

Videos

For the experiment, seven video clips were selected from the working corpus of the ITACA project, consisting of news programs broadcast by the three major channels of the major television corporations in Spain: Mediaset, Atresmedia and RTVE (De los Reyes et al., 2020, p. 77), according to several filtering criteria: lag in the clips, subtitle speed expressed in CPS, and format type of the SDH (live or semi-live). First, a filter was applied to differentiate between live and semi-live, and then subsequent filters were established according to the mean values of CPS and lag in order to be able to extract clips close to one minute in length. Following expert recommendations (Orero et al., 2018, p. 112), all clips have a beginning and an end, although they do not necessarily coincide with the beginning and end of a particular news item; rather, the duration of the clip was prioritized, as well as the fact that it complied with mean values that would allow us to offer respondents clips with significant differences in order to draw conclusions closer to the real situation.

Thus, in the live formats, we filtered both by-lag values and by-CPS values, which yielded three clips. As for the semi-live format, due to the scarcity of clips reaching one minute in length, we decided to filter only through CPS, since the lags in this type of format are very small and, therefore, there was not a significant number of samples with large lags. In this case, four clips were selected, ranging from below recommended CPS amounts to well above the recommended CPS. The last of the clips is a hybrid, containing part “live” and part “semi-live” broadcast. Specifically, the simple news items shown in Table 1 were used, dealing with various current political and social issues in Spain, and presenting relevant information both verbally, in oral and written form, and visually.

Questionnaire

All participants completed a questionnaire via the project’s online platform. For various reasons, given the difficulty some people had in accessing the electronic format, participants in some cases opted to

TABLE 1
VIDEO CLIPS INCLUDED IN THE STUDY

Clip	Reference	Type	SDH Format	Lag (s)	CPS	Mean Lag (s)	Mean CPS
1	A3 Weekend	Item/Lead-in	Live	10 < lag	-	12.1	17.5
2	A3 Lunchtime	News/poll	Live	8 > lag	15 >	7.4	14
3	A3 Weekend	Background/item	Live	8 < lag < 12	15 >	8.85	12.9
4	La1 Lunchtime	Summary	Semi-live	-	10 < CPS < 15	4.1	14.8
5	La 1 Lunchtime	Summary	Semi-live	-	15 < CPS < 17	0.25	16.8
6	La 1 Lunchtime	Brief news	Semi-live	-	17 < CPS < 20	1.72	19.2
7	A3 Weekend	Live	Both	-	20 <	4.8	21.7

Source: The authors.

complete the questionnaire on paper, and the data were subsequently entered by hand by the experimental team. The questionnaire was designed to combine open and closed questions, and both single-answer and multiple-choice, and consisted of 38 questions divided into nine sections: one on demographic information, another on television viewing habits, and the remaining seven on users' understanding and evaluation of the selected items.

Given that the subjects had to perform the task without external help, we sought to limit the length of the questionnaire, and thus only 21 of the 38 questions were about comprehension. Similarly, following expert recommendations (Brancato et al., 2006, p. 36), most were closed questions and were written in simple, straightforward language. In order to reproduce as far as possible the natural conditions in which subjects watch television, they were only able to watch the clips (with sound and subtitles) once, and immediately afterwards had to read and answer the questions.

The comprehension questions were intended to test the extent to which participants were able to identify the audiovisual information in the clips. To this end, each section included two general comprehension questions about each clip and one exclusively visual question, the information for which could not be deduced in any way from the subtitles or the audio. All these questions were of a closed type and were simple in nature, since of the five answer options, only one was correct and another was "I'm not sure".

Regarding the evaluation of the SDH, the last question in the section on television habits was aimed at evaluating the perception of the quality of the subtitles in general, and the last question of each section sought to evaluate the perception of the quality of the subtitles of the clip they had just watched. As in previous ones, this was a closed-ended question, and here the answer options followed a five-point Likert scale "good-bad", plus one "I'm not sure" option. If the answer was "very bad", "bad" or "only fair", the respondent accessed a table in which he/she had to mark the reason for this "negative" rating according to five parameters (lag, spelling, reading speed, identification of characters, and degree of synthesis), using a scale from 1 to 6, where there

was also the option “I don’t think it is relevant”. In addition, there was the option of adding another parameter (“Other reasons”) in an open response format.

Statistical procedure

The normality tests conducted on the results used in the quantitative analysis yielded normal results ($p < 0.05$), allowing subsequent descriptive calculations to be made, such as obtaining means and standard deviations. All statistical tests were carried out with Minitab version 18.

The analysis of the audiovisual comprehension questions was based on the answers collected by means of percentage values according to three levels, in decreasing order of comprehension: correct answer, “I’m not sure”, and incorrect answer. The arithmetic mean and the standard deviation were calculated in order to see the distribution or variability of the values obtained from the central tendency.

The analysis of the evaluation of the SDH was done quantitatively. The percentage values of the answers to the questions on the quality of the subtitles were collected, both in the general section on television habits and in each of the final questions of the seven clips of the study, and a hypothesis test was carried out for the two groups of videos and the two main variables.

ANALYSIS AND RESULTS

Audiovisual comprehension

Table 2 sets out the summary of results related to participants’ audiovisual comprehension. Overall, the correct answers are close to 40%; these values were of the same order of magnitude as the answers in which the recipients expressed their doubts (37.5%); about a quarter of the answers were incorrect (24.2%). All mean values show significant and high values of their standard deviations, which are uniform in each group of the three possible answers, given the practically constant and low values of the ratios between means and standard deviations (2.5, 2.1 and 2.1).

TABLE 2
OVERALL RESULTS OF AUDIOVISUAL COMPREHENSION (SUMMARY)

Total	Mean	Stdv	Mean/Stdv
Correct answer	38.4	18.4	2.1
I'm not sure	37.5	14.7	2.5
Incorrect answer	24.2	11.7	2.1

Note: Results as percentages.

Source: The authors.

Table 3 presents the data individually for each clip. We see that the correct answers are at around 50% in three of the seven clips (clips 2, 5 and 7), while the clip with the highest value of incorrect answers is number 6 (38.4%), followed by two clips with values at around 30% (clips 3 and 4). On the other hand, the option "I'm not sure" is the most frequently selected for clips 1 and 4. From this information it can be deduced that clip 2 is the one that enjoyed the greatest comprehension and, similarly, that clip 4 is the one that was least understood. Likewise, since the first three clips presented high values of lags, clips 4, 5 and 6 were characterized by high reading speeds and clip 7 had both characteristics; in a first approximation it could be concluded that comprehension in subtitles with lags was better than in those with high reading speeds. All these findings were within the framework of generally insufficient comprehension in all the clips, plus their great variability (standard deviation), since there are videos with different levels of comprehension in all the groups.

TABLE 3
OVERALL RESULTS OF AUDIOVISUAL COMPREHENSION (PER CLIP)

Clip number	1	2	3	4	5	6	7	Mean	Stdv	Mean/Stdv
Correct answer	35.2	54.7	28.3	17.6	52.2	31.5	49.1	38.4	13.9	2.8
I'm not sure	41.5	35.9	42.1	52.2	27	30.2	33.3	37.5	8.5	4.4
Incorrect answer	23.3	9.4	29.6	30.2	20.8	38.4	17.6	24.2	9.5	2.5

Note: Results as percentages.

Source: The authors.

Quality of subtitles

This section includes a quantitative analysis of the data on the quality of the subtitles. Table 4 shows the general appreciation data in the section on television habits, where we see that a majority of users believe that the SDH broadcast on television is “only fair” (51.9%), while a quarter rate it as “good” or “very good” and only 20% consider it to be “bad” or “very bad”. In the first instance, these opinions indicate the disparity of opinions of hearing impaired people regarding this issue. On the other hand, the participants who saw deficiencies in the SDH point to subtitle lag (48%) and reading speed (43%), the two independent variables in the reception study, as the most serious problems. Next in importance is excessive synthesis, while spelling and character identification are considered less relevant.

TABLE 4
GENERAL EVALUATION OF THE SDH

Evaluation	Result	Reasons for negative evaluation	Result
Very good	9.6	Lag	48
Good	15.4	Spelling	23
Only fair	51.9	Reading time	43
Bad	11.5	Identification of people	28
Very bad	7.7	Excessive synthesis	35
I'm not sure	5.8	Other (not relevant)	18

Note: Results as percentages.

Source: The authors.

However, the data on the evaluation of the clips are far from presenting this predominantly positive view, as can be seen in Tables 5 and 6. In all the videos, with the exception of clip 5, the percentages of “bad” or “very bad” quality are clearly higher than those of “good” and “very good”, with values ranging from 15% to 35% for the negative ratings, and results of between approximately 2 and 6% for positive ones. The fact that clip 5 is highly rated should not be surprising, since it is one of the videos broadcast semi-live, with subtitles, which have hardly any lag (average value of 0.25 seconds). Similarly, the importance of

lag as a quality factor is confirmed in all seven videos, while reading speed stands out in three (clips 4, 6 and 7). Synthesis is highlighted in two clips, and character identification in only one, while spelling always presents the lowest percentage in all clips.

TABLE 5
EVALUATION OF THE SUBTITLES OF THE CLIPS STUDIED

Clip number	1	2	3	4	5	6	7	Mean	Stdv
Very good	5.8	5.8	5.8	1.9	19.2	3.8	1.9	6.3	5.9
Good	7.7	11.5	21.2	9.6	32.7	23.1	9.6	16.5	9.3
Only fair	26.9	40.4	26.9	36.5	25.0	30.8	46.2	33.2	8
Bad	23.1	13.5	23.1	21.2	9.6	19.2	15.4	17.9	5.2
Very bad	34.6	28.5	25	30.8	9.6	15.4	19.2	23.4	9
I'm not sure	3.8	1.9	0	1.9	5.8	9.6	9.6	4.7	3.8

Note. Results as percentages.

Source: The authors.

The perception of the quality of the first three live videos (characterized by their lag in the SDH) was also compared to that of the next three semi-live videos (characterized by their speed in the SDH), to test which variable was more relevant in the perception of quality. For this purpose, the t-Test (Table 6) was performed for the two groups of videos for the two main variables ($N = 52 \times 3 \text{ videos} = 156$), which also confirms that the receivers penalize lag more than reading speed, with a mean value of 2.43 for the former variable, and a mean value of 2.69 for the latter. The p value (0.087) is slightly higher than the statistically significant value used as standard (0.05), which indicates that the statement that recipients penalize lag more than reading speed can only be made with a 91.3% degree of confidence, compared to the accepted value of use, which is 95%.

TABLE 6
t TEST OF *STUDENT* OF TWO SAMPLES

Method				
μ_1 : mean of Quality lag num				
μ_2 : mean of Quality speed num				
Difference: $\mu_1 - \mu_2$				
Descriptive statistics				
Sample	N	Mean	Stdv	Standard error of the mean
Quality lag num	156	2.43	1.26	0.10
Quality speed num	156	2.69	1.37	0.11
Test				
Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$			
Alternative hypothesis	$H_1: \mu_1 - \mu_2 \neq 0$			
<i>t</i> value	GL	<i>p</i> value		
-1.72	307	0.087		

Note: Results as percentages.

Source: The authors.

DISCUSSION AND CONCLUSIONS

The present study fulfills the objectives detailed above and we are in a position to state that the hypotheses are confirmed, since the high speed of subtitles and excessive lags do not allow for a correct understanding of the audiovisual message by hearing-impaired users, and these users believe both variables to be the cause of the perception that the live SDH is of insufficient quality.

More specifically, we can conclude that the high speeds and lags of the SDH of news programs on Spanish television do not allow for overall comprehension of the audiovisual content, since less than half of the responses related to comprehension are correct. In the absence of a more in-depth study on these two variables, it might be hypothesized that comprehension in subtitles with lags would be worse than that with subtitles characterized as being high-speed, always taking into account that both factors lead to insufficient

comprehension. This is a substantive contribution of the present study, since testing the hypothesis in this sense yielded values very close to being statistically significant.

Regarding the perception of live subtitling, there is a disparity of opinion on quality among users, this not surprising due to the inherent heterogeneity of the hearing-impaired population. However, the majority believe that the quality is only fair, which might indicate that the critical spirit of users has increased with respect to previous years, when they seemed satisfied with the quality of the SDH provided (Arnáiz, 2015). The perception of users is in line with the hypotheses of this study, and hence we can affirm that the speed and lags of subtitling are the two most decisive parameters, both for comprehension and for opinions on the quality of live SDH, although it should also be borne in mind that there are other parameters (Arnáiz, 2012) or aspects inherent to deaf people that can also affect the comprehension of the subtitling. Likewise, it is important to recall that a single, watertight criterion on the lag or speed of subtitling can hardly meet the needs of the entire hearing-impaired population (see, for example, Burnham et al., 2008; Tamayo, 2015). This leads us to argue for the theoretical and practical revision of these two parameters by the relevant authorities in terms of the publication of standards and good practice guides, and by those responsible for live SDH on television channels. It also leads us to encourage regular research into these two parameters in live SDH, towards a broader view of the evolution of these issues in the industry, through both descriptive studies and, for understanding and perception, through reception studies such as the one described here.

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Bibliographic references

- Arnáiz, V. (2012). Los parámetros que identifican el subtítulo para sordos. Análisis y clasificación. *MonTI*, 4, 103-132. <https://doi.org/10.6035/MonTI.2012.4.5>
- Arnáiz, V. (2015). Long questionnaire in Spain. In P. Romero-Fresco (Ed.), *The Reception of Subtitles for the Deaf and Hard of Hearing* (pp. 95-117). Peter Lang.
- Asociación Española de Normalización y Certificación-AENOR. (2012). *Norma UNE: 153010. Subtitulado para personas sordas y personas con discapacidad auditiva*. AENOR.
- Brancato, G., Macchia, S., Murgia, M., Signore, M., Simeoni, G., Blanke, K., Körner, T., Nimmergut, A., Lima, P., Paulino, R. & Hofmeyer, J.H.P. (2006). *Handbook of recommended practices for questionnaire development and testing in the European Statistical System*. European Statistical System. <https://bit.ly/3cvrHud>
- Burnham, D., Leigh, G., Noble, W., Jones, C., Tyler, M., Grebennikov, L. & Varley, A. (2008). Parameters in Television Captioning for Deaf and Hard-of-Hearing Adults: Effects of Caption Rate Versus Text Reduction on Comprehension. *The Journal of Deaf Studies and Deaf Education*, 13(3), 391-404. <https://doi.org/10.1093/deafed/enn003>
- Creswell, J. W. & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th edition). Sage.
- De los Reyes, J., Mejías, L. & Martí-Ferriol, J. L. (2020). Retraso y velocidades de lectura en la subtitulación para personas sordas de los informativos. *Sendebarr*, 31, 69-86. <https://doi.org/10.30827/sendebarr.v31i0.11836>
- Díaz-Cintas, J. (2006). *Competencias profesionales del subtitulador y el audiodescritor*. CESyA, Centro Español de Subtitulado y Audiodescrición. <https://bit.ly/34Y51QZ>
- Díaz-Cintas, J. (2010). La accesibilidad a los medios de comunicación audiovisual a través del subtítulo y de la audiodescrición. In L. González & P. Hernández (Eds.), *El español, lengua de traducción para la cooperación y el diálogo* (pp. 157-180). Instituto Cervantes.
- Eugeni, C. (2009). Respeaking the BBC News: A Strategic Analysis of Respeaking on BBC. *The Sign Language Translator and Interpreter (SLTI)*, 3(1), 29-68.

- Hennink, M., Kaiser, B. & Marconi, V. (2016). Code saturation versus meaning saturation: how many interviews are enough? *Qualitative Health Research*, 27(4), 1-18. <https://doi.org/10.1177%2F1049732316665344>
- Ivarsson, J. & Carroll, M. (1998). *Subtitling*. TransEdit.
- Izard, N. (2001). La subtítulos para sordos del teletexto en televisión española. In L. Lorenzo & A. M. Pereira (Eds.), *La traducción subordinada II: el subtítulo (inglés-español/gallego)* (pp. 147-168). Universidade de Vigo.
- Jensema, C. J., El-Sharkawy, S., Danturthi, R. S., Burch, R. & Hsu, D. (2000a). Eye movement patterns of captioned television viewers. *American Annals of the Deaf*, 145(3), 275-285. <https://doi.org/10.1353/aad.2012.0093>
- Jensema, C. J., Danturthi, R. S. & Burch, R. (2000b). Time spent viewing captions on television programs. *American Annals of the Deaf*, 145(5), 464-468. <https://doi.org/10.1353/aad.2012.0144>
- Lambourne, A. (2006). Subtitle Respeaking. in *TRALinea* [Special Issue on Respeaking]. <https://bit.ly/2NN8oSF>
- Marín, C. (2017). *El informativo de televisión*. Gedisa.
- Martí-Ferriol, J. L. (2019). El proceso de pautado, la sincronización y la velocidad de lectura. In G. Torralba-Miralles, A. Tamayo, L. Mejías, J. J. Martínez-Sierra, J. L. Martí-Ferriol, X. Granell, J. De los Reyes, I. de Higes, F. Chaume & B. Cerezo (Eds.), *La traducción para la subtítulos en España. Mapa de convenciones* (pp. 135-146). Publicacions de la Universitat Jaume I.
- Muller, T. (2015). Long questionnaire in France: The viewers' opinion. In P. Romero-Fresco (Ed.), *The Reception of Subtitles for the Deaf and Hard of Hearing* (pp. 163-189). Peter Lang.
- Orero, P., Doherty, S., Kruger, J.-L., Matamala, A., Pedersen, J., Perego, E., Romero-Fresco, P., Rovira-Esteva, S., Soler-Vilageliu, O. & Szarkowska, A. (2018). Conducting experimental research in audiovisual translation (AVT): A position paper. *The Journal of Specialised Translation*, 30, 105-126.
- Pereira, A. M. (2005). El subtítulo para sordos: estado de la cuestión en España. *Quaderns: Revista de traducció*, 12, 161-172. <https://www.raco.cat/index.php/QuadernsTraduccio/article/view/25486>

- Romero-Fresco, P. (2010). Standing on quicksand: viewers' comprehension and reading patterns of respoken subtitles for the news. In J. Díaz-Cintas, A. Matamala & J. Neves (Eds.), *New insights into audiovisual translation and media accessibility* (pp. 175-195). Rodopi.
- Romero-Fresco, P. (2011). *Subtitling through Speech Recognition: Respeaking*. Routledge.
- Romero-Fresco, P. (2012). Quality in live subtitling: the reception of respoken subtitles in the UK. In A. Remail, P. Orero & M. Carroll (Eds.), *Audiovisual translation and media accessibility at the crossroads* (pp. 111-133). Rodopi.
- Romero-Fresco, P. (2015). *The Reception of Subtitles for the Deaf and Hard of Hearing*. Peter Lang.
- Romero-Fresco, P. (2018). Reception studies in live and pre-recorded subtitles for the deaf and hard of hearing. In E. Di Giovanni & Y. Gambier (Eds.), *Reception Studies and Audiovisual Translation* (pp. 199-223). John Benjamins.
- Romero-Fresco, P. & Pedregosa, I. (2014). Live Subtitling: A Qualitative Analysis of the First Round of Measurements. In Office of Communications (Ofcom) (Ed.), *Measuring live subtitling quality: Results from the first sampling exercise* (pp. 25-31). Office of Communications. <https://bit.ly/2XNYxCo>
- Rojo, A. (2013). *Diseños y métodos de investigación en traducción*. Síntesis.
- Tamayo, A. (2015). *Estudio descriptivo y experimental de la traducción en TV para niños sordos. Una propuesta alternativa* (Unpublished doctoral dissertation). Universitat Jaume I, Castellón.