

Audiovisual Translation as a Tool for the Dissemination of Scientific Research *

La traducción audiovisual como instrumento para la divulgación de la investigación científica

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Abstract: This paper gives a thorough overview of some of the audiovisual productions made to this day under the auspices of the University of Zaragoza with the aim of disseminating scientific knowledge. It unveils what research groups and audiovisual producers are most active, whether their videos have been translated to English and if so, which translation mode has been chosen. The analysis of a sample taken from the most productive groups reveals that the practices applied in subtitling for parameters like spatial layout, duration, and text editing need to be improved to enable optimal readability and comprehension, and a good international reception of these productions.

Keywords: translation; scientific dissemination; audiovisual productions; subtitling; quality in subtitling.

Summary: Introduction. Method and Corpus. Results. Conclusions.

Resumen: El presente artículo ofrece un análisis detallado de varias producciones audiovisuales auspiciadas por la Universidad de Zaragoza que tienen por objetivo la divulgación científica. Estudia qué grupos o unidades son los más activos, qué documentales se han traducido al inglés y en qué modalidad de traducción audiovisual. El análisis de una muestra revela que es necesario mejorar las prácticas aplicadas al subtítulo en parámetros tales como la disposición espacial, la duración o la edición de los textos para optimizar su lectura y comprensión y, por ende, para lograr una buena recepción internacional de dichas producciones.

Palabras clave: traducción; divulgación científica; producciones audiovisuales; subtítulo; calidad del subtítulo.

Sumario: Introducción. Método y corpus. Resultados. Conclusiones.

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INTRODUCTION

The dissemination of scientific achievements is of paramount importance for the general public to have access to scientific knowledge. Moreover, it is, to a large extent, responsible for the image that scientists project of themselves and of their work within their own communities and out of them. The last decade has opened the door to new tools and formats that can help in that dissemination. A growing number of video clips are appearing on our screens, featuring scientists belonging to research groups or to multidisciplinary groups, made for the purpose of communicating scientific knowledge. The value of the image is crucial in our daily lives and this fact cannot be ignored when the intention is to bring the general public closer to present scientific developments.

This paper gives a thorough overview of some of the audiovisual productions made to this day under the auspices of the University of Zaragoza, Spain. Following enquiries to find out which groups are most engaged in the scientific dissemination that is supported by documentaries, a second step has involved determining their visibility, i.e. where these video clips can be accessed and the number of visits to the websites where they are logged. This last issue inevitably leads in turn to the question of whether they have been translated to English, the universal scientific language, which groups and scientific disciplines are more willing or better equipped to offer a translation and, if it has been offered, what mode of audiovisual translation has been chosen. Having reached this point, the analysis focuses on technical aspects concerning the formal presentation of subtitles. A thorough view of these audiovisual translated texts will determine to what extent the general practice follows the standard guidelines that ensure quality in subtitles.

A consideration worth bearing in mind is that the strategic plan of the University of Zaragoza envisages an internationalisation programme that aims at integrating the international dimension in the fields of teaching and research.¹ The translation of these short audiovisual texts would seem to fit in that line. It is equally important, however, that the

¹ The *IX Jornada de Internacionalización de la Universidad de Zaragoza*, held on 10 June 2019 presented its internationalisation map, a work in progress that aims to show in what ways and to what extent the university is establishing connections with other universities abroad.

final product conforms to the general conventions of presentation to ensure a better reception among the target audience.

1. METHOD AND CORPUS

Preliminary enquiries have been made to find out which research groups of the University of Zaragoza and audiovisual producers are most active in the making of these video clips. The information obtained from a number of scientists belonging to research groups and from other scientists related to those groups who help in the dissemination of scientific knowledge, complemented with a thorough search in websites, point to nine different groups which disseminate scientific findings in Aragon. They are the following:

1. *Videos on nanotechnology*. “Cápsulas de nanotecnología” (Nanotechnology Capsules) is a project of audiovisual content, promoted by the SAMCA Chair at the University of Zaragoza, which aims at disseminating and encouraging research on nanoscience and nanotechnology. The project offers ten episodes in video podcast format of four to five minutes each. The subjects covered are: smart textiles, graphene, the electronic nose, intelligent surfaces, nanomedicine and nanotherapy, nanodiagnosis, carbon nanotubes, nanomagnetism, nanophotonics, and nanosecurity. Ninety percent of the series “Nanotechnology Capsules” has been translated into English. Henceforth it will be referred to as “Group A.” Nine of the ten video clips have two links. One of the links shows the videos dubbed into English; the interviews which appear in them, however, introduce the Spanish scientists, who speak Spanish and the English subtitles of what they are saying appear at the bottom of the screen. A different link leads to the Spanish dubbed version of the clip. The “Nanotechnology Capsules” are the only videos in our corpus that are translated into English in two modes: dubbing and subtitling. The video chosen for this analysis was the one in the series that showed the greatest number of visits in YouTube: “‘Tejidos inteligentes’: Investigación nanotecnológica aplicada a tejidos funcionales” (Smart Textiles). It was published in 2014 and had 6,906 visits in July 2019. This video contains thirteen subtitles, which correspond to the interviews where the scientists speak.

2. *Videos belonging to the Museo de Ciencias Naturales* (Natural Science Museum). The museum’s YouTube channel contained nine videos in July 2019. Two of them are only images, one has not been

translated and the rest (six) are subtitled into English (66% of the total, as this analysis focuses on problems that appear in the translation of clips). The video chosen for this analysis was again the most frequently seen of the group: “La explosión cámbrica” (The Cambrian Explosion). Lasting 4’51”, it was published in 2015 on the museum’s YouTube channel and had 3,120 visits in July 2019. The video contains forty-eight subtitles. Henceforth it will be referred to as “Group B.”

3. *Videos of the Unidad de Cultura Científica* (Unit of Scientific Culture). The Unit of Scientific Culture of the University of Zaragoza works together with the Department of Communication to give more visibility to the university researchers’ work. Its aim is to disseminate among citizenship and firms the outcome of their advances in innovation and encourage a scientific culture in society. This entity belongs to the network of units of scientific culture of the Fundación Española para la Ciencia y la Tecnología (FECYT) (Spanish Foundation for Science and Technology).

The site contains thirty-five short documentaries, but only five (14.28% of the total) are subtitled into English. The video chosen for this analysis was the most frequently seen of the group: “Montañas de agua” (Water Mountains). Lasting 15’13”, it was published in 2010 in Vimeo and had 549 visits in July 2019. Henceforth it will be referred to as “Group C.”

Apart from the groups already mentioned there are two more videos in English, but one is a trailer of a film which is not publicly accessible (see 4 below) and the other one could be classified as artistic, rather than informative (see Group 5 below).

4. *Individual video* (for the time being only the trailer is accessible): “Chasing Traces from the Past.” This documentary was sponsored by the Department of Geography and Regional Planning at the University of Zaragoza. This trailer is subtitled into English. With a duration of 2’43” and published in 2018 on YouTube (among other sites), it reached 2,664 visits in July 2019.

5. *Videos of the research group Geotransfer*, sponsored by the Department Sciences of the Earth, based at the University of Zaragoza. They have produced five videos, but only one is translated (subtitled) into English (20% of the total production).

The video “Earth. Poems and music of the spheres” was published in 2017. With a duration of 10’15”, it had 918 visits in July 2019. The video has an artistic, rather than informative, purpose.

6. *Videos belonging to the Espiral series of scientific documentaries.* The series hosts eight documentaries, running for thirty minutes in total, which exhibit the findings of Aragonese researchers. A team of members of the Instituto de Ciencias de la Educación (Institute for Education Sciences) of the University of Zaragoza and another team of professionals of the Spanish national public broadcaster RTVE produced these videos in combination with the audiovisual production company Sintregua. Even though they are visually appealing, none of them have been translated.

7. *Audiovisual Production Company Sintregua.* Besides its cooperation in the production of videos for the *Espiral* series, three more documentaries deal with primitive life on earth and one is about the life of the mathematician García de Galdeano. They are not translated into English.

8. The *Instituto Universitario de Matemáticas y Aplicaciones* (University Institute of Mathematics and Applications) published the video “Ars Qubica” in 2015. Lasting 3’50” and published in Vimeo, it had 87,900 visits in July 2019. It can be found in the section on dissemination on their website. Unfortunately, there are no subtitles for their translation, only music and images.

9. *Consejo Superior de Investigaciones Científicas* (Spanish National Research Council). There are nineteen videos. All of them are in Spanish, with a duration between four and five minutes. None have been translated.

The productions of all the videos analysed have been funded by the Fundación Española para la Ciencia y la Tecnología (Spanish Foundation for Science and Technology).

Since my main interest is to focus on the internationalisation and spread of scientific research, a sample has been taken from the three groups which have, to a lesser or greater extent, published their videos in Spanish and English. Videos containing no linguistic description have not been considered for the analysis, given that no translation has been carried out in them. They have been named Groups A, B and C. A closer observation reveals that Group A has translated 90% of the series of videos. Group B has translated 66.6% of the videos published and Group C has translated 14.28% of their videos. The rest of the groups offer their videos in Spanish only.

As explained above, a sample of videos has been taken in order to illustrate what these three groups are offering. The criterion for this

choice has been the fact that they are the most visited videos within their groups. The analysis shows that subtitling and dubbing are the translation modes chosen, with a clear priority for subtitling, a tendency that appears to be consolidating (its lower cost may be, in part, at the root of this preference).

The viewing of the three videos was followed by the creation of a separate transcript drawn from the existing subtitles in English which indicated their time code and duration. Subtitles were then numbered and analysed.

There is a substantial difference between a translation and a translation for subtitling. It is well known among experts in audiovisual translation that

reduction is one of the main strategies implemented in this type of translation. . . . the translator has to dismiss a word-for-word approach and look for the main ideas being conveyed, rephrasing them in a way that sounds natural and does not jar with the image or the soundtrack of the original. (Díaz-Cintas, “Teaching and Learning to Subtitle” 100)

Subtitles usually offer a reduced form of the oral source text. The reason is that viewers need enough time to combine reading the subtitles with watching the action on the screen and listening. There are a number of conventions which regulate the delivery of subtitles on screen.

In the last years, guidelines have been offered by a number of authors (Karamitroglou’s “A Proposed Set of Subtitling Standards in Europe”; Carroll and Ivarsson’s “Code of Good Subtitling Practice”; Díaz-Cintas’ *Teoría y práctica de la subtitulación: Inglés/Español*; Díaz-Cintas and Remael’s *Audiovisual Translation*; and Díaz-Cintas’ “Teaching and Learning to Subtitle in an Academic Environment,” to name only a few) to establish a layout in subtitles that guarantees optimal readability and comprehension of the subtitles edited. In other words, a combination of several parameters related to spatial layout, duration and text editing is required to obtain subtitles of quality. This analysis concentrates on the following technical aspects, based on Karamitroglou:

SPATIAL LAYOUT

1. Number of characters per line.

2. Number of lines per subtitle and their design and position on the screen.
3. Font colour.

TEMPORAL PARAMETERS

4. Reading speed.
5. Time of permanence of subtitles on screen.

TARGET TEXT EDITING

6. Line segmentation. I will provide here my own classification of the poorly segmented subtitles in the corpus. The aim is to show which types of line breaks that go against subtitling guidelines are most frequent in the three groups.
7. Translation (and other) mistakes.

The overall number of subtitles in the sample is 281: 13 belonging to Group A: “Cápsulas de nanotecnología: Tejidos inteligentes” (Nanotechnology Capsules: Smart Textiles), 48 to Group B: “La Explosión cámbrica” (The Cambrian Explosion) and 220 to Group C: “Montañas de agua” (Water Mountains).

2. RESULTS

2.1 Spatial Layout

2.1.1 *Number of characters per line*

The fact that these texts are expected to be watched on a computer screen and not on a cinema screen determines the number of characters recommended. According to international praxis, “the maximum number of characters allowed on a one-line TV subtitle is 37, including blank spaces and typographical signs” (Díaz-Cintas and Remael 84). A higher number of characters inevitably reduces the readability of the subtitles, the font size being reduced, too. Moreover, viewers must combine their watching the image on the screen with their listening to the sound code and reading, so they need enough time to read and combine the different

codes mentioned. Therefore, a reduction of the text in the subtitles would be advisable.

In the case of Group A, which contains 13 subtitles, all of them exceed the recommended number of characters per line.

Figure 1 shows by means of bars the degree of excess in characters found, distinguishing a first bar (1 subtitle), comprising between 38 and 41 characters, which might be accepted by some software, such as Subtitle Workshop, Aegisub, etc.; a second bar (two subtitles), between 41 and 50 characters, which would be unacceptable for any screen; a third bar (7 subtitles), between 51 and 60 characters and a fourth bar (3 subtitles), exceeding 60 characters. A note on the procedure: in those cases where the two lines of the subtitle exceed the recommended number of characters the one that contains the highest number is the one that has been considered.

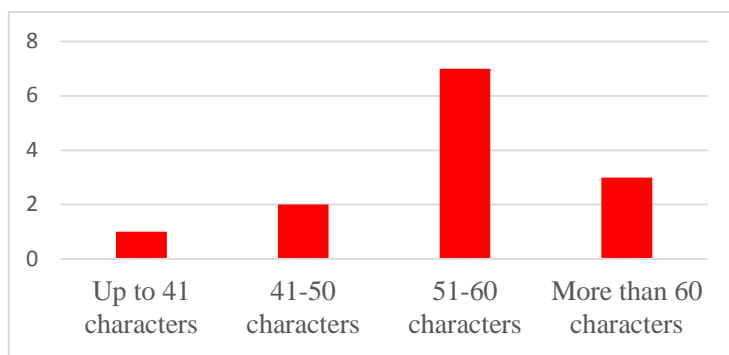


Fig. 1. Excess in the number of characters per line in Group A.

Example (1)

SUBTITLE 8

NOVAREL technology incorporates active ingredients within (57 chs.)
the fibre to maintain and enhance the beauty of the skin. (57 chs.)



Still 1. Illustration of the number of characters per line in Group A. “Cápsulas de nanotecnología.” 03:05.

This excessive number of characters will very possibly hinder a good reading of the subtitles. Therefore, the contents will go unnoticed with some of the information meant to be conveyed getting lost.

Group B contains 48 subtitles, of which 29 (60%) exceed the recommended number of characters per line.

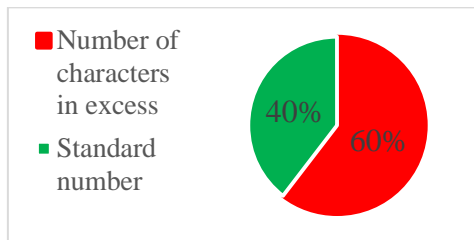


Fig. 2. Percentage of subtitles that conform to the standard number of characters or that exceed that number in Group B.

Figure 3 shows the degree of excess in characters found in this group of subtitles. A first bar (6 subtitles) covers the rank between 38 and 41 characters; a second bar (20 subtitles), between 41 and 50 characters, and a third bar (3 subtitles), between 51 and 60 characters:

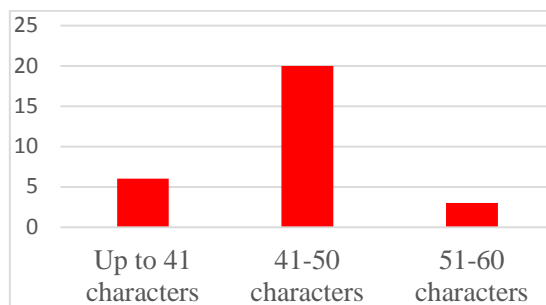


Fig. 3. Excess in the number of characters per line in Group B.

Example (2)

SUBTITLE 21

As a result of its colossally powerful tectonic (46 chs)
forces, the geology of the planet has unearthed (47 chs)



Still 2. Illustration of the number of characters per line in Group B.
“La explosión cámbrica,” 01:56.

Group C contains 220 subtitles, of which 108 (49.09%) exceed the recommended number of characters per line.

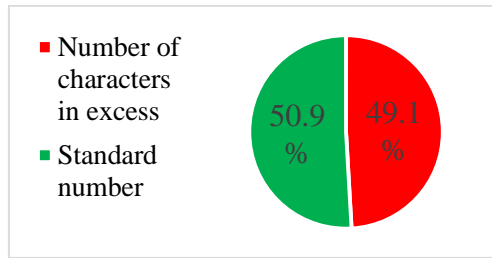


Fig. 4. Percentage of subtitles in Group C that conform to the standard number of characters or that exceed that number.

Figure 5 shows the degree of excess in characters found in this group of subtitles. A first bar (27 subtitles) covers the rank between 38 and 41 characters; a second bar (48 subtitles) between 41 and 50 characters, a third bar (28 subtitles) between 51 and 60 characters and yet a fourth bar (5 subtitles) surpassing 60 characters:

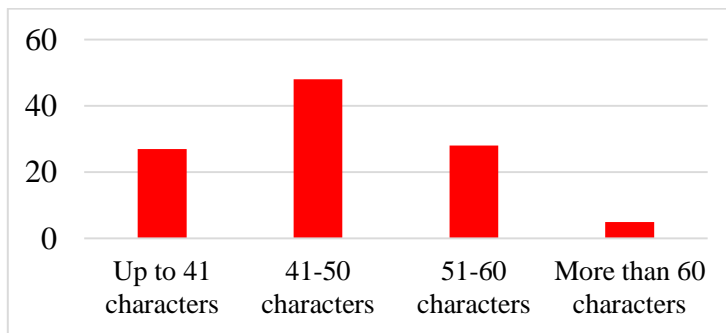


Fig. 5. Excess in the number of characters per line in Group C

Example (3)

SUBTITLE 3

Why does it confront extreme dangers by diving (46 chs.)



Still 3. Illustration of the number of characters per line in Group C.
 “Montañas de agua,” 00:46.

This aspect is one of the weakest points and needs to be improved, the percentages of excess in the number of characters fluctuating between 49% and 100%. A possible solution could involve segmenting long lines into two, with the subsequent distribution of the words on each line. As Karamitroglou puts it, this is a better option “because the eye and the brain of the viewers render a two-line subtitle as more bulky [sic] and, as a result, accelerate the reading process” (6).

2.1.2 Number of lines per subtitle and their design and position on the screen

A maximum of two lines per subtitle is recommended, in a pyramidal design and avoiding too long lines, to facilitate the reading. When two lines of unequal length are used, the upper line should preferably be shorter to keep more of the image free (Carroll and Ivarsson). The study conducted by d’Ydewalle and De Bruycker on the eye movements of children and adults concluded curiously that a more regular reading pattern was detected in standard two-line subtitles; they are said to be “more likely to be fully processed (than one-line subtitles), because they contain information which cannot be easily inferred from the visuals” (in Perego et al. 246).

As far as their position is concerned, subtitles should be placed at the bottom of the screen (Karamitroglou 2); the second (lowest) line should appear at least 1/12 of the total screen height above the bottom of the screen. This position can be altered in cases where the background image

on the screen is white or too light and hinders a good reading of the message; where the most important detail of the action occupies the bottom of the screen and the subtitle can interfere with the image; and in the third place, when the documentary gives information about the identity or profession of the person speaking. In these cases, the subtitle moves to a middle or upper position in the screen (Díaz-Cintas, *Teoría y práctica de la subtitulación* 147). As to the width of the subtitle, a space of at least 1/12 of the total screen width should be provided to the left of the first character and at least 1/12 of the total screen width to the right of the last character, for each subtitle line (Karamitroglou 2).

All subtitles in Group A contain a maximum of two lines and follow the indications concerning their position on the screen but their length exceeds the standard requirements, as commented above. No pyramidal structure is possible with that length.

Group B succeeds in presenting two-line subtitles in a pyramidal structure. No more than two lines appear in any. They are placed at the bottom of the screen, except when the name of a scientist or some valuable information is provided (which is the case in 15 subtitles, amounting to 31.2%). In that case, the subtitle shifts to make room for the new information appearing on the screen. At a given moment when the relevant image shows on the lower part of the screen, the subtitle appears at the top, so as not to hinder the view.

In Group C all subtitles contain a maximum of two lines, but their length in half of the total number exceeds the standard requirements, as commented above. The pyramidal structure is found in 35.9% (a great percentage—56.8%—are subtitles of only one line) of cases.

2.1.3 *Font colour*

Type characters in Group A are white and shadowed. The fact that they are shadowed helps to solve legibility problems, particularly when they appear against a light background. When this is the case, reading them at the speed programmed can be a challenge. This presentation, however, seems to be encouraged by the Fundación Española para la Ciencia y la Tecnología (Spanish Foundation for Science and Technology).

Characters in Group B are also white and shadowed, to facilitate the reading.

In Group C type characters are yellow and shadowed, presumably to achieve a sharper contrast between them and the image (at times snow

appears on the background); having the subtitles in white would have hindered normal reading.

The three groups of subtitles analysed present the standard requirements for lettering and font.

2.2 Temporal Parameters

2.2.1 *Reading speed*

As previous research has proved, a comfortable reading of the so-termed conventional subtitles (those that have a maximum of 37 characters per line, and a maximum of two lines) by an average viewer, defined as “aged between 14–65, from an upper-middle socio-educational class” (Karamitroglou 3) would require six seconds. Therefore, the so-called 6-second rule is currently regarded as the standard, both in teaching environments and in the subtitling industry. Authors like Martí Ferriol (“Nueva aproximación”) affirm that “la ‘6 second rule’ parece ser la que goza de mayor aceptación entre los espectadores” (41). Moreover, I agree with the same author (“Subtitle Reading Speeds”) that characters per second (CPS) seem to be a better parameter to express reading speed across languages than words per minute (WPM), as it is more constant. This means a recommended reading speed of 12 characters per second (CPS). Therefore, “periods longer than six second should be reconsidered and split into smaller units” (Díaz-Cintas and Remael 89). These being the recommendations, the practice now involves a general greater demand on the reading speed. Subtitling programs seem to regard up to 17 CPS as acceptable. Taking this into account I shall now proceed to explain the practice applied in the three videos under analysis.

Of the 13 subtitles edited in Group A, 10 (76.9%) exceed the number of CPS recommended. Figure 6 below indicates by means of a bar chart the degree of excess in the number of CPS per second. As can be seen, six subtitles show between 17 and 20 CPS and four subtitles between 21 and 28 CPS. At the root of this problem is the excessive number of characters displayed in a shorter time than required. Thus, this aspect is tightly connected with the number of characters per line, as analysed in 2.1.1.

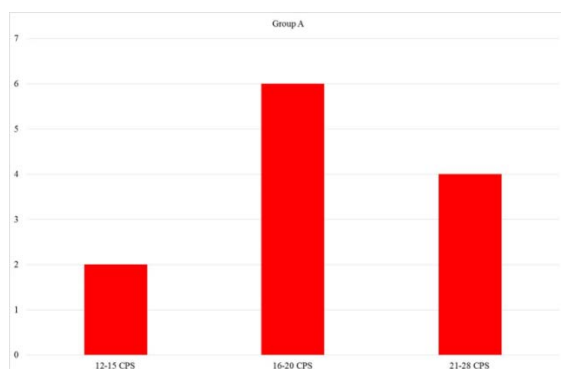


Fig. 6. Excess in the number of characters per second in Group A.

Example (4)

SUBTITLE 7. 03:01–03:04

and studying an extensive range
of additives to be included in them.

The reading speed here is 22 CPS.

Example (5)

SUBTITLE 4. 02:44–02:49

After producing the enriched fibres, they had to be clinically tested to (72 chs.)
observe their behavior and to verify that they had the desired effect. (70 chs.)

The reading speed here is 28 CPS.

In Group B, 26 of the 48 subtitles (54.1%) comply with the currently acceptable speed.

Figure 7 shows the degree of excess in the number of CPS per second. The distribution in bars indicates that 12 subtitles are in the range between 17 and 20 CPS, and 10 subtitles between 21 and 44 CPS.

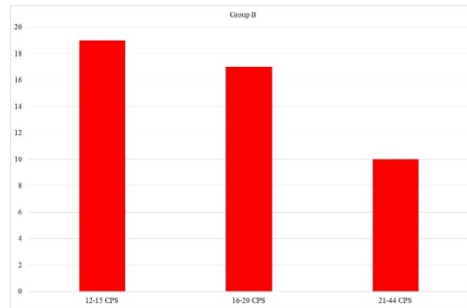


Fig. 7. Excess in the number of characters per second in Group B.

Example (6)

SUBTITLE 19. 01:45–01:46

This, in turn, accumulates over time.

The reading speed here is 37 CPS.

Example (7)

SUBTITLE 21. 01:56–02:00

As a result of its colossally powerful tectonic forces, the geology of the planet has unearthed

The reading speed here is 23 CPS.

In Group C, of the total number of 220 subtitles, 145 (65.9%) exceed 16 characters per second.

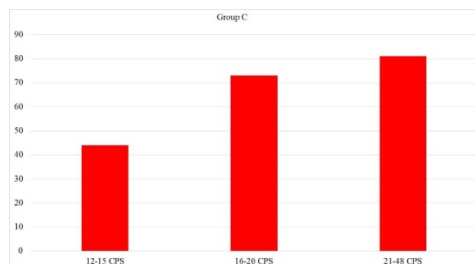


Fig. 8. Excess in the number of characters per second in Group C.

Figure 8 above shows the degree of excess in the number of CPS per second. As the bar chart indicates, 63 subtitles are in the range between 17 and 20, and 82 between 21 and 48 CPS.

Example (8)

SUBTITLE 13. 01:35–01:37

In the long run, the goal became
to get to know the Aragonese “ibones”

The reading speed here is 34 CPS.

Example (9)

SUBTITLE 29. 02:25–02:28

was the transportation of a large amount
of material through a mountainous area.

The reading speed here is 26 CPS.

The question of reading speed seems to need urgent improvement in the three groups. A reduction of the number of characters as well as an adjustment in the time on screen are required according to the results showed in previous studies and to the academics’ general recommendations, so that reading can be done in better conditions.

2.2.2 *Time of permanence on screen*

Each subtitle should remain on the screen for at least one second and no longer than six seconds (Carroll and Ivarsson; Díaz-Cintas, *Teoría y práctica de la subtítulos*). If the subtitle stays on screen for too short a time, the audience may be disappointed if they are unable to follow the textual track: “The risk is run that the information will appear as a flash and viewers will not be able to read it” (Díaz-Cintas, *The Didactics* 95). On the contrary, if the subtitle stays on screen too long, the audience will automatically tend to re-read it.

All subtitles in Group A comply with this requirement. In Group B, only 2 subtitles stay for 7 seconds (4.1% exceed the time on screen). In Group C, all subtitles comply with this condition.

2.3 Target Text Editing

2.3.1 *Line segmentation*

The translator aims at editing subtitles which can be understood in the short time they are read by the audience. Subtitling guidelines recommend distributing the text from line to line in sense blocks and divide it according to linguistic units (Carroll and Ivarsson; Gerber-Morón and Szarkowska). Following Díaz Cintas and Remael, “to create subtitles that can be easily read and understood, one of the golden rules is that they are semantically and syntactically self-contained” (172). According to psycholinguistic literature on reading, subtitle lines should end at natural linguistic breaks in order to improve/enhance readability (Álvarez et al. 2). In poorly segmented texts, text processing will be impaired, as a greater cognitive effort will be needed (Perego et al. 249). Given that it is not always possible to offer a complete sentence in each subtitle, segmentation becomes very important. As Karamitroglou puts it,

[s]ubtitled text should appear segmented at the highest syntactic nodes possible. This means that each subtitle flash should ideally contain one complete sentence. In cases where the sentence cannot fit in a single-line subtitle and has to continue over a second line or even over a new subtitle flash, the segmentation on each of the lines should be arranged to coincide with the highest syntactic node possible. (6)

This guarantees that fragments split along these lines include the largest possible amount of related semantic information (Álvarez et al. 3). It is important to remember that each subtitle should make sense in itself. The division into parts obtained should function independently. For that purpose, syntactic-semantic considerations should be taken into account (Díaz-Cintas and Remael), although in practice professional subtitlers may differ in the way they execute the segmentation (Álvarez et al. 4).²

This preference for subtitles segmented according to semantic and syntactic phrase structures has been proved by several studies. One of them has recently been carried out by Gerber-Morón and Szarkowska, in

² Álvarez et al. present a solution for automatic segmentation, i.e. the use of machine learning classifiers to create segmentation models adapted to each subtitling company's needs independent of the language used.

which participants with different audiovisual translation traditions from the United Kingdom, Poland and Spain, were tested. Perego (“What Would We Read Best?”) points out that the following phrases should appear on the same subtitle line: noun phrases (nouns preceded by an article); prepositional phrases (simple and/or complex preposition heading a noun or noun phrase); and verb phrases (auxiliaries and main verbs or phrasal verbs). At the clause and sentence level, constructions that should be kept on the same subtitle line include coordination constructions, subordination constructions (clauses introduced by the conjunction ‘that’); *if*-structures and comparative constructions (clauses preceded by the conjunction ‘than’).

In another experimental study, Perego et al. aimed at testing the influence of line segmentation quality in two-line subtitles on cognitive processing. Their initial assumption was that “ill-segmented subtitles could hinder information processing, slowing down reading, and causing a significant decrease of performance in text recognition (*vs.* well-segmented subtitles)” (Perego et al. 250). They detected that fixations on ill-segmented subtitles were slightly longer than fixations on well-segmented subtitles.

Here follows my own classification of the poorly segmented subtitles found in this corpus. It intends to show what types of line breaks that go against subtitling guidelines are most frequent in the three groups analysed.

TYPE 1

A frequent disruption found is the separation of the adjective from the noun or adverb that follows, the adverb from the verb, the article (or another determiner) from its following noun, and the preposition from the following phrase clause.³

³ Eye tracking analyses conducted by Gerber-Morón and Szarkowska show that dwell time was higher in most syntactically segmented noun phrases (*IndArt*, *DefArt*, *Comp*, *Poss*) (where viewers made more revisits) as well as in syntactically segmented *Conj*, and lower in non-syntactically segmented *AuxVerb* and *AdjN*. Moreover, non-syntactically segmented subtitles induced longer dwell time for verb phrases (*AuxVerb* and *ToInf*) (where viewers made more revisits).

TYPE 2

This type considers to-infinitives, phrasal verbs or collocations, a conjunction and its following clause or a pronoun and a following clause, which should not be split up.

TYPE 3

In the case of compound verbal forms the auxiliary should not be separated from the lexical verb (past participle or infinitive). In Group A, the number of subtitles affected by ill segmentation, according to syntactic-semantic considerations, is 3 (23%).

Example (12)

SUBTITLE 4

they had to be clinically tested to
observe their behavior

Belonging to Type 2, subtitle 4 illustrates the division between preposition *to* and the infinitive that follows.

In Group B, the number of subtitles affected by ill segmentation, according to syntactic-semantic considerations is 17 (35.4%), most of them classified as Type 1.

Example (13)

SUBTITLE 31

Trilobites are primitive arthropods from the
Palaeozoic Era that are now extinct.

This subtitle shows the split of the definite article from the following noun phrase (Type 1).

Example (14)

SUBTITLE 45

is their acquisition of a sexual
form of reproduction.

This subtitle illustrates the separation of an adjective from its following noun.

In Group C, the number of subtitles affected by ill segmentation, according to syntactic-semantic considerations, is 41 (18.6%); Type 1 (as established in the classification) is mostly affected, followed by Type 2 and finally Type 3, in a decreasing order.

Example (15)

SUBTITLE 171

cleaning days or educational
activities about the environment.

This subtitle illustrates the separation of an adjective from its noun (Type 1).

Example (16)

SUBTITLE 188

But an important part of those
mountains consists of water

In this example the determiner has been separated from its following noun (Type 1).

Example (17)

SUBTITLE 183

who asked us: “ey, what’s
happening with the “Ibones”?”

This subtitle shows the split of the auxiliary and the main verb (Type 3).

2.3.2 Translation (and other) mistakes

There is nothing to remark in the subtitles of Group A, in this aspect. Group B shows, however, a mistranslation like the following:

Example (18)

SUBTITLE 25

Cambric period takes its name
from the Roman name of Wales, Cambria

The audience hears this message in voice over: “El periodo cámbrico toma su nombre del término romano para Gales, *Cambria*,” and reads the translation above on the screen.

The English term for the period is ‘Cambrian.’ In the following subtitles it appears in its correct form. The importance of the mistranslation at times of the word ‘cámbrico’ lies in the fact that this is precisely the period described in the documentary and the name which gives the title to the documentary.

Some grammatical errors (four in total) can also be detected. Here follow two examples:

Example (18)

SUBTITLE 26

Wich it is called in Welsh Cambric.
It is about the similar

The voice over says “que en Gales se dice *Cambric*. Bastante similar” and the subtitle shows a double subject with a spelling mistake (*wich it*), the reduplication of the subject and the un-English form *about the similar*.

Example (19)

SUBTITLE 37

even though trilobites are its most
popularly known image.

There should be agreement between the subject (trilobites) and the possessive. The expected form is ‘their.’

Example (20)

SUBTITLE 7

of a previously unheard-of ecological
phenomenon—predation—

A typographical issue can be seen here: the en-dash is discouraged in subtitling (Díaz Cintas and Remael 111).

The subtitles of Group C show a number of mistranslations, involving inadequate lexical choices (3) or even grammar mistakes (3). Let us look at a sample:

Example (21)

SUBTITLE 10

that simple question was the detonator for a
group of researchers and volunteers,

The voice over says “Aquella sencilla pregunta fue el detonante para que un grupo de investigadores y voluntarios...” The expected term in English in this context is ‘trigger.’

Example (22)

SUBTITLE 119

until the big rivers that supply the fields and the big cities.

The voice over says “hasta llegar a los grandes ríos que abastecen campos y ciudades.” Here preposition ‘to’ would be required instead of ‘until.’

Example (23)

SUBTITLE 150

who are the genuine inhabitants of those lakes

The voice over says “[estos peces] . . . que son los verdaderos habitantes de los ibones, desequilibrando su . . .”. The antecedent of the relative being ‘peces,’ the relative pronoun expected would be ‘that’ or ‘which.’

At other times mistakes of a different nature appear. There is repetition of part of the text:

Example (24)

SUBTITLE 202

we will be better prepared
to preserve to preserve them

And typos (3) are also present, as in the writing of the figure ten thousand:

Example (25)

SUBTITLE 57

approximately 10.000 years ago when the glaciers

As this sample has tried to show, a greater effort is needed to improve the quality of the language transfer in these audiovisual products, in order to preserve both the image of professional translators as a whole as well as the image of scientists. Needless to say, the viewers also have the right to a high-standard translation.

CONCLUSIONS

The aim of this paper was to report on current practices in the localisation of audiovisual texts for the dissemination of scientific findings. This research has identified, after a number of interviews and internet searches

through research groups and department websites, nine groups that are at present active in the making of video clips for that purpose (research groups, chairs, units or institutes) at the University of Zaragoza. How many of these videos have been translated to English for a wider audience beyond Spain was one of my concerns. The data reveal that 23% offer a version in a foreign language, which is invariably English. This percentage should be raised to fit into the internationalisation programme envisaged by a university whose strategic plan aims to integrate the international dimension in the fields of teaching and research. The translation of these short audiovisual texts would seem to fit into that plan, but at present it seems to be almost exclusive within three groups: a Chair working on nanotechnology, the videos hosted by the Natural Science Museum and the videos produced by the Unit of Scientific Culture.

After an initial observation, we found that all the translated texts present subtitling and dubbing as the preferred translation modes, the former doubling the number of the latter. A careful analysis of a sample of the most frequently seen videos produced by the three groups has allowed us to detect practices that need improving in order to reach the target audience in a more effective and successful way.

Professional translators of subtitled products know that the written version of speech in subtitles should be a reduced form of the oral source text. A verbatim rendering is not to be expected in subtitling, given that the subtitle interacts with the oral and visual codes of the text. But the observation of these subtitled videos points to complete translations, where strategies like condensation or elision are hardly ever met.

Aware as we are of the importance that the final product reaches standards of quality, this analysis has tried to determine to what extent these productions conform to the international guidelines for quality layouts in subtitles. Optimal readability and comprehension can only be obtained through a combination of several parameters related to spatial layout, duration and text editing, following Karamitroglou.

In the spatial layout parameter, the number of characters per line needs serious improvement, the variation ranging from 100% of subtitles in Group A that exceed the recommended number of characters per line to 49% in Group C.

In the temporal parameter, reading speed is the weakest aspect: 45.9% of subtitles (in Group B) and 76.9% (in Group A) exceed the recommended number of characters per second. In this respect, we

should not overlook the fact that viewers less accustomed to subtitling and more to dubbing may take longer to read some linguistic units (thus requiring more effortful cognitive processing) than other viewers accustomed to subtitles.

As for the target text editing parameter, line segmentation seems to be the weakest point; the percentage of subtitles affected by a poor segmentation ranges from 18% in Group C to 35% in Group B. This aspect is also pertinent with regards to the degree of success in the reception of audiovisual texts, since, as Gerber-Morón and Szarkowska (18) put it, “following syntactic rules for segmenting subtitles can facilitate the reading process to viewers less experienced with subtitling.”

These aspects need to be improved and the quality of the language transfer should be raised to contribute to a good international reception of these productions. For that potential success, the role of translation is fundamental and it should be, in the words of Díaz-Cintas, “understood as an integral part of the process of the artistic creation” of the audiovisual text (“Striving for Quality in Subtitling” 207).

Scientists seem to be aware of the importance of the international dissemination of their findings and are making efforts in that sense. Their work is presented in an attractive format which can potentially reach a very wide audience. This initiative finds the support of academia, but greater zeal is needed to obtain the wished-for end-product quality. This is the job of professional translators and producing companies, rather than of amateur subtitlers. Awareness of the key role of quality translations (and of the guidelines that make them possible) should also reach the institutions that fund these projects, even at national level. In summary, efforts must be directed at obtaining better results, for the present and future benefit of the scientific community as well as of their target audience. These are some hints for that improvement.

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