UNIVERSITAT ROVIRA I VIRGILI

THE RECEPTION OF (NON)PROFESSIONAL SUBTITLING.

David Orrego-Carmona

DOCTORAL THESIS

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DOCTORAL THESIS

Supervised by Professor Anthony Pym
Department of English and German Studies

UNIVERSITAT ROVIRA I VIRGILI

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I hereby certify that the study *The Reception of (Non)Professional Subtitling*, presented by David Orrego-Carmona for the award of the degree of Doctor, has been carried out under my supervision at the Department of English and German Studies of the Universitat Rovira i Virgili.

The research and the thesis fulfill all the conditions for the award of an INTERNATIONAL DOCTORATE, in accordance with current Spanish legislation.

Anthony Pym   President
Intercultural Studies Group   European Society for
Universitat Rovira i Virgili   Translation Studies
Tarragona, Spain

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Abstract

People all over the world, especially young viewers, rely on non-professional subtitles to access audiovisual content. This research investigates the reception of professional and non-professional subtitles among university students with different levels of proficiency in English. Three versions of subtitles were included: the professional DVD subtitles distributed in Spain and two non-professional subtitle versions: one Spanish and the other Latin-American.

An initial survey, which obtained 332 responses, was used to screen the population and test their level of English. For the second stage, which consisted of an eye-tracking experiment and an interview, 52 participants (26 with a low level of English and 26 with a high level of English) had their eyes tracked while they were watching three clips from a popular TV show. Each clip was shown with a different type of professional or non-professional subtitling and participants answered a comprehension questionnaire after each of them.

The findings show that the type of subtitles does not affect the distribution of attention, but the professional subtitles were received with shorter mean fixation durations. The participants' performance with the professional and the Latin-American non-professional versions were similar and gave better scores than with the Iberian non-professional version.

The eye-tracking measurements show that the level of proficiency in English affects subtitle-reading behavior. The participants with low proficiency had a more standardized behavior and exhibited a high degree of reliance on the subtitles. The highly proficient participants' behavior has more variation, with some participants depending on the subtitles as much as the other group and other participants with almost no attention to the subtitles. The level of proficiency in the source language and the participants' perceived effort to read the subtitles were identified to have an effect on their enjoyment of the audiovisual content.

The results from this study show that, from the audience's perspective, non-professional subtitles can provide results similar to professional subtitles. Additionally, the study shows that the level of proficiency in the source language affects the subtitle-reading behavior and that viewers might have some degree of individual control over subtitle reading.

Resumen

Actualmente, la subtitulación no profesional permite a personas en todo el mundo acceder a material audiovisual en otros idiomas. Esta investigación estudia la recepción de la subtitulación profesional y no profesional entre estudiantes universitarios con diferentes niveles de inglés. El estudio incluye los subtítulos profesionales para DVD distribuidos en España y dos versiones no profesionales, una española y una latinoamericana.

Se usó una encuesta inicial para estudiar a la población y evaluar su nivel de inglés. En esta etapa se recolectaron 332 respuestas. La segunda etapa combinó una sesión de visionado con rastreo ocular y una entrevista. Los participantes, 26 con nivel alto de inglés y 26 con nivel bajo de inglés, vieron tres segmentos de una serie de televisión mientras se registraban los movimientos de sus ojos. Después de cada segmento, los participantes respondieron una prueba de comprensión. Cada segmento usaba uno de los tipos de subtítulo mencionados anteriormente.

De acuerdo con los resultados, el tipo de subtítulos no afecta la distribución de la atención, sin embargo se registraron fijaciones promedio más cortas con los subtítulos profesionales. En la prueba de comprensión, los participantes obtuvieron resultados más altos con los subtítulos profesionales y la versión no profesional latinoamericana que con la versión no profesional española.

Los participantes leyeron los subtítulos de forma diferente dependiendo de su nivel de inglés. Aquellos con un nivel bajo leyeron casi todos los subtítulos y mostraron un comportamiento similar. Por otro lado, aquellos con un nivel alto de inglés mostraron mayor variación: algunos siguieron los subtítulos tanto como el otro grupo y otros casi no los miraron. Tanto el nivel de inglés como la percepción del esfuerzo necesario para leer los subtítulos afectan la percepción del material audiovisual.

Los resultados del estudio muestran que, desde la perspectiva de la audiencia, la recepción de material audiovisual con subtítulos profesionales y no profesionales puede ser comparable. Además, el nivel de conocimientos del idioma original del material audiovisual afecta la forma como los espectadores leen los subtítulos. Finalmente, el comportamiento de los participantes parece indicar que los espectadores tienen algún grado de control sobre la lectura de los subtítulos.

Resum

Actualment, la subtitulació no professional permet a persones de tot el món accedir a material audiovisual en altres idiomes. Aquesta recerca estudia la recepció de la subtitulació professional i no professional entre estudiants universitaris amb diferents nivells d'anglès. L'estudi inclou els subtítols professionals per a DVD distribuïts a Espanya i dues versions no professionals, una espanyola i una llatinoamericana.

Es va fer servir una enquesta inicial per estudiar la població i avaluar el seu nivell d'anglès. En aquesta etapa es van recol·lectar 332 respostes. La segona etapa va combinar una sessió de visionat amb rastreig ocular i una entrevista. Els participants, 26 amb nivell alt d'anglès i 26 amb nivell baix d'anglès, van veure tres segments d'una sèrie de televisió mentre es registraven els moviments dels ulls. Després de cada segment, els participants van respondre una prova de comprensió. Cada segment feia servir un dels tipus de subtítol esmentats anteriorment.

Segons els resultats, el tipus de subtítols no afecta la distribució de l'atenció, però es van registrar fixacions mitjanes més curtes amb els subtítols professionals. En la prova de comprensió, els participants van obtenir resultats més alts amb els subtítols professionals i la versió no professional llatinoamericana que amb la versió no professional espanyola.

Els participants van seguir els subtítols de forma diferent depenent del seu nivell d'anglès. Aquells amb un nivell baix van llegir gairebé tots els subtítols i van mostrar un comportament similar. D'altra banda, aquells amb un nivell alt d'anglès van mostrar més variació: alguns van seguir els subtítols tant com l'altre grup i uns altres gairebé no els van mirar. Tant el nivell d'anglès com la percepció de l'esforç necessari per llegir els subtítols afecten la percepció del material audiovisual.

Els resultats de l'estudi mostren que, des de la perspectiva de l'audiència, la recepció de material audiovisual amb subtítols professionals i no professionals pot ser comparable. A més, el nivell de coneixements de l'idioma original del material audiovisual afecta la forma com els espectadors llegeixen els subtítols. Finalment, el comportament dels participants sembla indicar que els espectadors tenen algun grau de control sobre la lectura dels subtítols.

Declaration

I, David Orrego-Carmona, hereby declare that this thesis is entirely my own work, carried out at the Universitat Rovira i Virgili for the degree of Doctor of Philosophy in Translation and Intercultural Studies, and that it has not been submitted as an exercise for a degree at any other university. Where other sources of information have been used, they have been acknowledged. Some parts of this thesis have been published previously in:

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David Orrego-Carmona

Disclaimer

Although this dissertation analyzes non-professional subtitling communities and their products, it does not promote, support, sanction, condone, foster or encourage any illegal activities involving copyrighted material. The different types of activities carried out over the Internet, such as file sharing, streaming, non-professional subtitling and all others related to the unauthorized distribution, translation and consumption of copyrighted products are referenced for research purposes only and should not be construed as an encouragement to engage in said activities.

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List of abbreviations

AOI	Area of interest
HLE	High Level of English
LLE	Low Level of English
L2/L3	Second/Third language
ms	Milliseconds
NP1	Iberian non-professional subtitles
NP2	Latin-American non-professional subtitles
PRO	Professional subtitles
pro-am	Professional amateur

A mi mamá, mi abuela y mi tía,

por todo lo que me han dado

Chapter 1. Introduction

I am a translator. In fact, I am a *professional* translator. In 2009 I received my degree in English-French-Spanish Translation from the Universidad de Antioquia in Colombia, the only university offering an undergraduate program in translation in the country. The conditions for training translators in Colombia are tough for everyone: trainers and trainees alike. Given the education system and the geographical location of the country, in most cases trainee translators start their studies at the university without any knowledge of English or French at all. There is little exposure to foreign languages and the possibilities of going abroad to learn them are scarce due to socioeconomic factors. In just four years, students are expected to learn two new languages, plus how to translate; their trainers, in turn, are expected to make that happen.

When I was at university, even trainers would say, "It is impossible to live just on translating in Colombia". At the time, this message painted a very dark perspective for us as students. Even if the conditions are rough, you do not want to be told you are never going to be able to build a career as a professional because there are no market opportunities in your domain. Although things are changing for the better, that was our introduction to the Colombian translation market only a couple of years ago.

The recognition of our profession at other levels of the society was even worse. We used to joke about how unknown the role of translators was among people we met. It was often the case that when we said we studied translation, people would assume we were being trained as language teachers or, in the best of cases, they guessed we were studying to become interpreters.

This poses some questions that, although no directly addressed in this research, may indicate an underlying motivation: How can you define *professionalism* in a context where the profession is hardly recognized? How can you identify yourself as a *professional* when you are told you are not going to make a career on it?

In my case, part of my first self-identification as a translator stemmed from my research work. From 2006 I participated in a study group on audiovisual translation within the Research Group on Translation Studies at the Universidad de Antioquia. This nicely complemented my training as a professional translator. In the translation program, we were trained as scientific and technical translators – audiovisual translation was not included in the curriculum.

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The study group was made up of four people, all translation students, with a shared interest in subtitling and enough free time to meet weekly to discuss publications, criticize translations and translation choices, and occasionally subtitle some films. In a sense, our mechanisms for grasping the essence of subtitling and developing subtitling skills were similar to those used by non-professional translation communities: we used the technology at our disposal; we developed our understanding of subtitling according to the information available on the Internet and in the existing literature; we tried to replicate what we considered good subtitling on television and cinema; we relied on peer-revision as a way to progress; and we translated in teams, always. Understandably, we related everything we learned to our previous knowledge and our professional training, which not only provided us with guidelines for subtitling but also made it easier for us to acquire a metalanguage in order to talk about it.

After a while, we paired up with a film club that was screening underground films from all over the word. We translated Danish, Japanese, Chinese and Polish films using the English non-professional subtitles as the pivot. That made our activity even more similar to that of non-professional subtitlers: we were unpaid, we were using a pivot language to translate underground films depicting underrepresented cultures from the other sides of the world, and our subtitles were used by people like us. The viewers were a self-selected niche audience with a special interest in a certain type of films.

During one of our meetings, one of my research fellows started commenting about a very bad translation she had come across. She was talking about some subtitles for the film *300* with serious mistakes, the type of translation mistakes that occur when translators work under poor conditions: low-quality video and audio, and without a script. She mentioned some examples and we became interested in what people would think of such subtitles and how the subtitle quality could affect the impression people had of the film.

In order to explain the relevance of this poor translation, I need to elaborate on the media piracy market in Colombia. At least since the cassette era, a large share of the Colombian media market is taken up by piracy. First, there were door-to-door cassette salesman or hawkers that would provide people with pirated tapes with the latest hits. In the 1990s, these hawkers later replaced their cassettes with CDs, which were easier to reproduce and could be sold cheaply. Then, when movies started to be distributed in DVDs, the sellers added this product to their portfolio. The sales of pirated films in CDs and DVDs grew to become a large and very active market. DVD players were within

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the purchasing power of more people, and DVDs were cheaper than cinema tickets. Further, they allowed more people to enjoy the content: unlike cinema tickets, a DVD copy could be enjoyed by a group of people at the same time, and viewers could rewatch the film as many times as they wanted.

Most towns in Colombia have no cinema; only the mid-size or large cities, of which there are just a handful, have cinemas and thus access to new releases. Even in those cities, not many people from low-income families have the opportunity to go to the cinema, in some cases out of habit, but in most cases, due to a lack of money. In my town, for instance, the two cinemas that were once in operation closed down in the late 1980s and early 1990s. For me, it was not until 2002 when my father took me to the cinema in Medellín that I had my first experience of the light beaming from the projector at a cinema theater. We watched George Lucas's *Star Wars: Episode II - Attack of the Clones*, and I was fourteen.

In more than one way, the pirated film industry opened the doors for many Colombians to access newly released audiovisual content for the first time and gave them (us) the possibility to catch up with the privileged classes dwelling in the cities. Soon, pirated DVD merchants were competing to acquire copies of the newest films and compiling the largest collection of titles. Big Hollywood blockbusters were (and still are) the most popular films, so when hawkers offered their clients the films that were showing at theaters at that moment, their market was benefiting from the expectation created by the official film advertising and merchandise.

That is how the copy with the poor translation of *300* came to be. Someone had filmed a crooked cam-recorded version in a cinema, with very bad video quality and poor sound – the kind of copy in which occasionally you can see the heads of the people sitting in the front row when they move or stand up. The translator probably worked without a script, directly from the rough audio track, causing some hilarious mistakes. We decided to set up a small experiment to see how this would affect viewers. We created an alternative version of the subtitles ourselves according to professional standards and invited some friends to watch one or both versions and then fill out a questionnaire.

As it will become evident, this initial exploration resembles the experiment I describe in this thesis, although our design was rudimentary. We had fun doing it, even though our main result was that it is difficult for people to recall specific subtitles when they watch a whole film. We assumed people would remember details of the subtitles,

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which was not the case. We were too focused on "good quality subtitles" back then and too much given to follow industry guidelines, because that is your take when you are supposed to be a professional translator.

Following the *300* experiment, we received some funding to carry out a research project on the state of audiovisual translation in Colombia and I started working as an in-house translator. I set reception studies aside and did not even consider *fansubs* as a possible research topic. I wanted to study the translation of Colombian films into English.

In one of my first Master's courses in Tarragona, we had a seminar with Michaela Wolf on *Translation as Social Field*. We were discussing the role of translators in society and the sociology of translators in terms of Bourdieu's *habitus* and *capitals* and Latour's *actor network theory*. At some point, I commented on fansubbing activities to support my argument and Michaela asked if I was working on the topic of non-professional subtitling. I was not, in fact, but her question and interest in the subject made me wonder why I should not be.

After an initial documentation and some discussions with my supervisor, it became evident that fansubbing represented a promising area of research. Little had been done on the area and most of it followed very traditional approaches, while the phenomenon as such was broad, had many outlets and included many different manifestations.

The work done for my Master's gave me the tools to become acquainted with the topic. I decided to take a more holistic approach. Reading the scarce initial literature, I realized that most of the work, with a few exceptions, did what I and my research fellows at the Universidad de Antioquia had done: assess non-professional subtitles according to professional standards. However, as some authors were already commenting, non-professional subtitles belong to a niche market with particular features. Using Chesterman's concept of "functional quality" (Chesterman 2004), I set out to explore the production and the reception conditions of the subtitles in order to see if non-professional subtitles could still be considered low-quality translations when assessed within a more open framework.

I adopted an ethnographic approach to detail the production conditions of a non-professional subtitling community that translated US television series and films into Spanish. By chance, one of the administrators of the community was living in Barcelona at the time and agreed to meet with me. I interviewed him and he offered to help in

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contacting other members in the group. He was also instrumental in accessing the forum records of the group. After describing the production conditions, I decided to move onto the reception side.

1.1.   Objectives

Having learned that non-professional subtitling communities could be structured groups with their own internal guidelines, training mechanisms and quality assurance processes, I became more interested in exploring the phenomenon from another perspective: the receivers of the translations.

The reach of non-professional subtitling communities and its international expansion, as shown by my research as well as by other researchers, indicated that non-professional subtitles were serving a wide audience. In a sense, the use of subtitles signaled a certain degree of acceptance among users: people were consciously downloading the subtitles and the membership of the communities was always on the rise.

Taking this into account, I embarked on the task of testing whether non-professional subtitles affected the reception of the audiovisual material in some way. It was necessary to narrow down the topic, so I restricted my research to the reception of those subtitles that try to replicate professional subtitles (professional-amateur subtitles). The population of the study was also defined as viewers between 18 and 30 years of age, which is the most popular key demographic for US audiovisual products, and I assumed that young viewers would be more familiar with non-professional subtitling due to their exposure to technology. I was aiming to test the subtitles based on the way they were received by the participants. Additionally, I wanted to learn about the viewers' opinions regarding non-professional subtitling, and to find out whether they were able to tell professional from non-professional subtitles. Learning about the users' motivations for consuming subtitles was equally interesting: most research pointed at the lengthy release delays as being the most important reason for people to use non-professional subtitling, but I wanted to see if there was something else that would arise from the viewer's opinions. This could shed some light on the reception of non-professional subtitles; it should provide information on how viewers are currently engaging with translated audiovisual products under the new media consumption context, as part of an international rather than local audience.

During the design of the study, an additional element that gained relevance was assessing the viewer's reception of the subtitles based on their level of proficiency in the original language of the audiovisual content. Initially, I entertained the possibility of testing the reception of audiovisual material in a language that was totally foreign to the participants. By so doing, I could have isolated any spoken verbal language interference from the audio track, as well as assessed the participants' comprehension on the grounds that they would have been exclusively relying on the subtitles. Studies involving eye-tracking methods commonly avoid using audiovisual content with audio tracks in languages that are known to the participants.

However, I considered the current consumption patterns and aimed at a more ecologically valid study. I was more interested in exploring the reception conditions in a setting as comparable as possible to the real-life use of subtitles. In a world where in most places the supply of audiovisual content is largely dominated by the United States, and where English has become a dominant international language, people, especially young people, are exposed to English on a regular basis. The language is not totally foreign to them anymore. Including audiovisual material with an audio track in English would allow for the assessment of consumption conditions that are comparable to everyday life circumstances of viewers in Spain, where I decided to carry out my research.

1.2.   Overview of the methodology

Starting with the aim of testing the differences in reception of different types of subtitles according to different levels of proficiency in English, I decided to follow a methodology that combined different data collection methods, in order to see how the findings from them compare and contrast. Given that the research took place in Tarragona, Spain, I included the professional subtitles distributed in the DVD version of the popular TV series *The Big Bang Theory*. For the non-professional version, I used the one produced by the Argentine community I had previously analyzed for my Master's research. This community produces subtitles in "neutral Spanish", so the audience from Spain could be considered part of their target. However, in order to have another point of comparison to reflect the variation among non-professional subtitling communities, I searched for an additional non-professional subtitle version, settling on one prepared by an Iberian group producing subtitles in Iberian Spanish.

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For the data collection, the study included a questionnaire, eye tracking and interviews and was carried out in two complementary stages. The first stage consisted of a questionnaire that screened the population in terms of audiovisual consumption habits, linguistic knowledge and use of the Internet, and a language test to select the participants for the second stage. In total, 332 valid responses to the questionnaire were collected. For the second stage, which consisted of individual eye-tracking sessions and interviews, 52 participants had their eyes tracked while watching three excerpts from the TV series. Each clip was shown with a different type of professional or non-professional subtitles and the participants were asked to answer a content-recall and satisfaction questionnaire after each of them. Right after the eye-tracking session, the participants were interviewed following a semi-structured procedure. Each interview was individual and lasted for between 15 and 20 minutes.

1.3. Structure

Chapter 2 introduces the concept of prosumers and its implications for the media industry as the background for the study of non-professional subtitling. Prosumerism results from the democratization of technologies, which gives consumers the means to exert some power over the products they consume. By analyzing how the relations between producers and consumers are changing the conditions under which audiovisual products are produced and consumed all around the world, I see non-professional subtitling as part of a participatory culture resulting from the prosumers' engagement.

My project finds its foundations in two areas of Translation Studies: studies on non-professional subtitling and research related to the reception of translated audiovisual content. The literature review, arranged according to these two areas, is presented in Chapter 3. The review of works related to non-professional subtitling purposefully ignores the studies related to other manifestations of non-professional translation, such as crowdsourcing or the non-professional translation of non-audiovisual texts. Along the same lines, in the reception section, this revision focuses strictly on the studies that explore the reception of audiovisual material.

The methods for my research are presented in Chapter 4. The first section provides an account of the methodological framework: it introduces the research questions, the hypothesis, and the operationalization of the variables. The chapter goes on to describe the selection and use of the data collection methods and comments on the

processing of the data. This chapter also offers information about the population under study and the sample selection process, as well as a description of the versions of the videos and subtitles included and the selection and preparation of the audiovisual material. Subsequently, it describes the pilot study and the conclusions resulting from it, followed by the revisions applied to the methodology. It concludes with an introduction to the statistical methods applied to analyze the data.

Chapter 5 presents the quantitative results obtained from the pre-experiment questionnaire and the eye-tracking sessions. First, the chapter describes the general panorama presented by the data, using descriptive statistics. Then, relying on mixed-effect models, the chapter presents the analysis of the participants' performances. A final section sums up the results of the quantitative analyses.

The results of the data analysis are discussed in Chapter 6. The chapter first tests the hypotheses presented in Chapter 4 and then highlights additional findings that proved to be interesting aspects of the participants' reception. Both quantitative and qualitative data are offered to support the discussion. Lastly, the chapter offers an account of the participants' engagement with translated audiovisual content in their everyday life based on the interview data.

The Conclusions summarize the main findings of the study and indicate the possible contributions to Translation Studies. The final chapter also presents the study's limitations and suggests future avenues that could help move forward the research on non-professional subtitling and the reception of translated audiovisual products.

Chapter 2. Background

This chapter gives a general overview of the current modes of interaction between viewers, audiovisual content, technological developments and other participants currently involved in the conception, production and consumption of audiovisual content as well as the repercussions these interactions have nowadays in our society. By describing some of the changes media have undergone in recent decades, this overview positions non-professional subtitling as involving *prosumers*, users that participate actively in the production of the content they consume. This overview is presented in order to describe the context in which non-professional subtitling unfolds and the position of the audience within that context.

Undoubtedly, technology has become intertwined with most, if not all, human activities. As with writing and books before, the democratization of technology prompted by the popularization of personal computers and the expansion of the Internet, has changed people's lives and fostered innovation (Hippel 2005). Technology has not only had an impact on the working conditions of most people in the developed and the developing world, but it has also modified the way people communicate and interact with others, and how they spend their leisure time. As Pope Benedict XVI put it in his message for the 47th World Communications Day, "[t]he digital environment is not a parallel or purely virtual world but is part of the daily experience of many people, especially the young" (2013:n.p.). People have learned to live in the virtual and physical worlds at the same time, and for young people, their virtual activities are part of their reality.

As a result, many people with technological tools enjoy spending their time on the Internet and seem to relish the possibilities offered by global connectivity. Further, through their interactions over the Internet, these people understand how they can enhance their activities and promote shared enjoyment by joining their efforts and operating as a group rather than as individuals. They start acting as structured communities of like-minded people that share similar motivations and are able to cooperate to promote shared goals. Some of these communities are made by consumers that come together, guided by their shared interest in specific products. Their interactions with other consumers change the way they engage with the products they consume and how they think about those products. Capitalizing on this new behavior,

consumers may start to take on a more active role in the distribution of content. Some of them, active consumers, move from the traditional, more passive role of a consumer to become highly active and empowered users that are able to interact with the production side of the chain.

2.1. Empowered viewers

2.1.1. The emergence of empowered users in the media context

Whether we want to accept it or not, the current status of networks and interconnections in the digital era places all of us in a network society (Castells 2000): we all participate in it, voluntarily or involuntarily, and we are all agents in it, consciously or unconsciously. Co-creational practices have evolved to such an extent that we take part in them without even being aware of it and without making any additional effort.

One of the most widespread examples of collaborative participation where users are not aware of their involvement is the use of reCAPTCHAs. By using distorted text images, CAPTCHAs (Completely Automated Public Turing test to tell Computers and Humans Apart) are used to tell real people from computers. They aim at preventing e-mail spamming and fake blog and forum posts, as well as protecting websites from automated software in general. Every regular Internet user is probably required to perform this authentication process at least once a day. Being aware of this fact, the reCAPTCHA project employs collective effort to digitalize books en masse: reCAPTCHAs display images that belong to digitalized books produced using OCR software (Ahn et al. 2008). About 200 million reCAPTCHAs are solved every day, which accounts for an aggregate task that would require 150,000 hours of work per day; and most of this is done by users who are not aware of their involvement.

Being involved in a collective activity with such a high impact without realizing it sounds like the antithesis of *empowerment*. The real effect arises not only when users are participating in large-scale activities, but when they consciously *decide* to participate and concentrate their efforts on something that interests them. The combination of work effort is what makes collaboration strong on the Internet. In the participatory culture context, consumers groups "leverage the combined expertise of their members" (Jenkins 2006:27). It is almost impossible for everyone to know everything, but it is possible for everyone to know a bit and then combine it with others'

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knowledge in order to have broader common knowledge. These groups of collective knowledge are not strictly new, but they operate more effectively thanks to the new technological tools for collaboration. This knowledge shared among networks is what is known as *cognitive surplus* (Shirky 2010). The cognitive surplus that results from participatory practices is what collectivities and companies exploit to carry out their endeavors. The combined knowledge and skills of regular people from all around the world make possible undertakings that were virtually unthinkable twenty years ago.

Before the existence of the Internet and affordable home technology, communication over long distances was either expensive or slow (Surowiecki 2005); economic, temporal and geographical factors affected the structures and functioning of collectivities. Sharing a physical location or having a previous relationship of some sort was mandatory if one was to know about somebody else's opinions or standpoints. Nowadays, the emergence of cheaper and more efficient technology for instant long-distance communication has empowered collectivities by overcoming those obstacles. Technology provides the power to operate at a global scale and has thus amplified the amount and impact of the work of such groups (Godin 2008:7). The ubiquity produced by the Internet and the tools produced by information technology make possible easier and more stable connections and enable constant communication among individuals with similar interests, values and goals.

Deuze (2007) explains that consumers' participation in the production process as co-creators has increased significantly in the last ten years in fields as varied as journalism, television and film production, advertising, design, and communication, to name but a few. For instance, citizen journalists report news through Twitter and have become a valuable source for TV news stations; amateur photographers have the chance to offer royalty-free photos for sale through online photo stocks; the crowdsourcing models of the fashion industry involve the consumers as part of the design process. The engagement of media consumers in media production highlights the emergence of user-generated content, not just as an addition to the industry-produced content but also as an important and necessary part of the industry's final product.

With these possibilities available to them, some consumers have become active consumers – *prosumers* (Tapscott and Williams 2006) – since the changes have allowed them to assume some of the powers and responsibilities that traditionally resided with the producers. The mechanisms of binary production-consumption interaction are

thereby altered, creating a place for the combined role. This emerging prosumer role is linked to both the traditional poles of the media industry.

Media systems are subject to constant reshaping under current conditions. Technology-empowered consumers are conscious of their powers and are pro-active regarding the products they are offered. It is thus inevitable that this has an impact on the system as a whole. All consumers, those who continue with the traditional, passive role as well as those who have adopted a more active participation, are directly affected. That is, the actions of prosumers have repercussions on the products other consumers buy or access, and most importantly, these actions are reflected in the way the products are conceived, generated and distributed. This prosumer part of the audience has become a more compact self-elected public that develops a profound affection for certain products and has a deep interest in participating in or influencing the creation and development of those products.

This context, in which users enact some powers that previously resided only with producers, allows the emergence of what Jenkins (2006) calls *convergence*. As he describes it, convergence involves all the changes that occur at the social, technological, industrial and cultural levels of the media industry, prompted by the actions and reactions of audiences. These new behaviors affect media flows and create an environment where different types of media systems coexist. The nature of these systems is highly flexible and fragmented, given that they depend on the constant redefinition of the relationships between the participants involved in them.

As pointed out by Jenkins (2004), there is a convergence between media companies and the consumers' interests, as well as between their behaviors. Media companies, especially those based in the United States, are aware of the impact of user activities and "are learning how to accelerate the flow of media content across delivery channels to expand revenue opportunities, broaden markets and reinforce viewer commitments", while at the same time consumers are enacting the control they have received through media technologies and "are fighting for the right to participate more fully in their culture, to control the flow of media in their lives and to talk back to mass market content" (Jenkins 2004:37).

These two forces are in constant dispute. Media companies respond in contradictory forms, ranging from encouragement to resistance, while consumers are still unsure about how much power they can actually exert, and their actions are in constant flux between legal and illegal activities. Nevertheless, Deuze (2007) argues

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that the role of costumers as co-creators in the media industry is indeed finding increasing acceptance in the culture industries. This does not necessarily mean that power has shifted from one extreme to the other, since the audience's newly acquired capacity still depends on concessions by the companies, which can still commoditize the audience's tastes and actions. The audience can challenge the company's decisions, but the final say remains with the company. However, Jenkins suggests companies care about what the audience think because offering what they want makes them more loyal to their products and, in the end, this generates higher revenue (2006:64).

In general, companies have leaned towards accepting and even promoting user-producer collaboration. However, there is no standard rule and the situations are determined on a case-by-case basis. It is worth noting that although the production of user-generated content accounts for a significant amount of total content, Aris comments that "it is estimated that about 1% of consumers contribute around 90% of all user-generated content" (2011:269). I will return to this at the end of this chapter. Participation also depends on the type of collaboration. The forms of viewer involvement are various and very different in extent. For instance, a reduced number of users leaves a full review of films in the *Rotten Tomatoes* website, but a very large group contributes with content rating because it only takes one click. In the end, this influences the wider audience (cf. Farrelly 2008). Thus the major changes the media industry is undergoing might actually be caused by a minority of active consumers. Furthermore, they might significantly influence the success of media content and its adoption by the general public.

To some degree, these active users act as early adopters who test not only the content but also what they can demand from the producers. In older models, when content was directed at a mass audience, this might have been a problem. Nevertheless, the current entertainment system is more targeted and fragmented, focused on niche markets rather than large segments of society. To attend to these markets, Anderson (2006) proposes that companies, instead of aiming at selling to a wide audience as soon as the product is released, opt for an approach called *less of more*. In his *long tail* model, Anderson suggests companies would be better off if they put more titles in circulation and made them accessible to niche audiences. In the long run, the combined market for low-sale products can generate more return than an initial blockbuster. It can also reveal the diversified nature of demand by serving a large number of small niche

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tastes. The success of such a model depends highly on the prosumers' ability to consciously decide what they want to consume and channel their resources to locate it.

2.1.1. *The impact of prosumers*

The impact of the audience's involvement in company's decisions, as has been noted, can be identified at different levels. I will rely on several examples in the following sections to describe how companies have capitalized on audience actions to develop their products or to avoid potentially negative outcomes: the case of *Game of Thrones* exemplifies a re-assessment of practices for HBO; Netflix used *House of Cards* to test whether audiences were ready to take on new forms of content distribution; the case of *Alice of Arabia* shows how companies protect themselves from taking on controversial projects, and Amazon is asking its subscribers what content they want to watch before the company starts producing it.

One of the strongest examples of newly acquired television consumption habits influencing people's viewing choices is that of *Game of Thrones*. The configuration of global audiences has enabled the creation of alternative, unauthorized distribution channels. Since audiences tend to operate as an international unit, they also expect or want to have access to new content as soon as possible, ideally at the same time it is first released in the United States. According to TorrentFreak, a BitTorrent blog and measurement site, *Game of Thrones* has been the most pirated TV show every year since 2012, peaking at 8 million estimated downloads in 2014, while the estimated TV viewers in the United States for the same year, where it is available to existing HBO television subscribers, is 7.2 million viewers.

There are two main reasons for people to access the material illegally. The first is the delay in international airing. For example, Australia was at the top of the list at the time with 10.1% of all illegal downloads per episode of *Game of Thrones* because the TV show airs there one week after the original broadcasting in the United States, and viewers did not want to wait for a whole week. Second, viewers are not offered a stand-alone online streaming option. Those viewers in the United States who are not subscribed to HBO on top of their cable contract have no option to legally watch the show online. This indicates how the company's business model does not meet the new needs of their audiences. HBO has confirmed they will try to combat piracy by reducing the delay in international airings, a strategy that has been applied since companies

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realized the impact of piracy. This has resulted in delay reduction from about six months to just one week or even hours (as has been the case in Latin America, Italy and Spain). However, this only partially remedies the problem. On April 7, 2015 a stand-alone version of HBO Go streaming service, HBO Now, went live. The launch of this service coincided with the premiere of the fifth season of *Game of Thrones* on April 12.

Another highly important change has been alteration in the way series are released. Serialized TV programs were originally designed to be consumed weekly, following a model that goes back to the 19th-century weekly distribution of serialized novels for publication in newspapers. Viewers would go back every week to the TV at a set time and wait for the show to start. The Internet, on-demand TV and digital TV have changed that. With the possibility to watch the episodes whenever they want, some devoted fans have developed the habit of *binge viewing* (i.e. watching several episodes or seasons of a serialized program all at once). Under these circumstances, companies are trying to turn the odds in their favor. In January 2013, Netflix broadcast *House of Cards*, the first drama series produced exclusively for an on-demand Internet streaming media provider. The drama is also the first serialized program that has been designed for binge viewing: all of the thirteen episodes that comprise the first season were made available online at once, on the same day, in all territories where Netflix was available. Additionally, for a month, free access to the first episode was offered to non-subscribers. The strategy proved successful and Netflix has extended it to other new TV series produced by them, and has also used it to bring back old TV series that were cancelled but that are still popular among fans. Although Netflix does not release information about its viewership numbers, its original shows create intense worldwide expectation and are constantly reviewed and rated highly by critics, as well being popular among regular viewers.

The power that audiences have achieved extends to the pre-production processes as well. On March 17, 2013 ABC announced that *Alice in Arabia* was in pre-production stage. The drama series was intended to depict the life of an Arabic-descendant girl from the United States who is forced to move to Saudi Arabia and suddenly faces a culture and a vision of the world completely different from what she knew. The heavy criticism on social networks right after the announcement and the concerns voiced by Islamic organizations about the possibly misleading portrayal of Muslims caused the cable network to back away from the idea and cancel the TV show even before the pilot

was shot. By March 21, only four days after the announcements, the project was shut down.

Yet another example of the direct power of the viewers is Amazon's strategy to select the new shows they will produce. On their stand-alone service *Amazon Prime*, Amazon has put in place a polling system to let its viewers decide what TV series should be produced. When participating in the survey, viewers watch a collection of pilots produced by Amazon and then vote to support the ones they think should become a full show. The highest-rated shows are picked up for a full season. The system proved successful and *Transparent* and *Mozart in the Jungle* became some of the most popular TV shows of 2014. Further, there is already expectation about the next batch of series, which was selected in January 2015.

Amazon's initiative was prompted mainly to counteract the growth of Netflix. Until recently, Netflix was the clear frontrunner in video-on-demand services worldwide. Now Amazon Prime is gaining terrain and soon HBO Go stand-alone will enter the competition. The emergence of more video-on-demand services provided by big companies proves that these players in the media production and distribution market are recognizing that users want to acquire more control and, if companies do not react, users will continue searching for workarounds on their own. These initiatives aim to give more power to the consumers while preserving the producers' rights and the benefits of being the main source of audiovisual content.

These cases exemplify the convergence described by Jenkins (2004) and show that companies have adopted a range of positive responses to the audience's actions. The consumers have managed to use technological tools to bring part of the production and distribution process under their control and, in response to this shift, the production side has seen some added value in these activities and has thereby implicitly recognized the validity of the consumers' actions. Companies have started to look for new strategies that are more in line with the audiences' new behaviors. Under the principle of affective economics (Jenkins 2006), the industry invites the viewers to go inside the brand, thus creating an emotional connection. As commented above, in this case there is clearly a positive response from the company. However, we can hardly talk about a loss of control: companies still have the means to reach a wide audience, through both legal and illegal distribution. For the audience, on the other hand, this significantly alters the traditional ways of accessing and engaging with media content.

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Nevertheless, there are other cases where producers resist the actions of consumers, in what Jenkins (2006) calls *media concentration*. In these cases, instead of reinforcing each other, the two forces enter into a struggle, since producers assume that convergence represents a risk for their status and, in the end, their possibilities of controlling the flows in the more traditional fashion.

2.1.2. *The impact of US media*

Except for audiovisual content (i.e. features and short films, documentaries, and TV series, among others) produced in the United States, media used to be mostly local, as in the European approach, where most countries used to have their own national media organizations and operate as independent profit centers (Polonska-Kimunguyi and Kimunguyi 2011), or regional, as in the cases of Spanish-speaking countries in Central and South America or TV production in the Arab world, mostly centered in Egypt. Initially, the products were subject to adaptations before being distributed on an international scale in different countries, and the rights for broadcasting and distribution were structured on a country-by-country basis (Aris 2011). This has changed. Although Hollywood has dominated the movie market since the first half of the last century, the internationalization of US television is a more recent phenomenon, going back only a couple of decades. At the same time, this has caused the emergence of international audiences. Viewers outside the US have grown used to US content and do not entertain the possibility of waiting longer than their peers in the US to access new content.

It could be argued that convergence and the rise of participatory culture in general is more strictly tied to the US industry and audience. This is true for the official channels of distribution and for more of the alternative distribution channels, but in the latter there is also a conscious decision-making process for selecting content that increases the variety of products. The US is indeed the largest exporter of television series and films in the world and clearly dominates the international market with an astonishing advantage over the other players, regardless of the fact that it is not the biggest producer of audiovisual content. The US exports its cultural products which project its branded image of nation. The discourse of cultural imperialism and the Americanization of television suggest that these conditions benefit the representation and reproduction of a reality created through the lens of the US industry, instead of allowing for local constructions of self-identity transmitted through productions. In

short, US ideologies are channeled through audiovisual content and are imposed on other regions as a vision of the world.

Supporting the argument of cultural imperialism through the illegal distribution of video content is the fact that a big share of the audiovisual content distributed over the Internet is produced in the United States. Underground films and audiovisual productions from other countries also make it through the network created by prosumers, however US products are always at the top of most downloaded TV series and films. The actions of prosumers maintain the paradox observed initially with the fan distribution of anime: the subversive distribution activities actually help in the popularization of the products, in this case, mainstream products. As such, prosumers help in the distribution of the US views of the world and its ideologies.

Nevertheless, the argument of cultural imperialism applies to a certain extent only. Having decided to bet on translational products, US producers also take into account the international audience when they are evaluating future projects (Moura 2011). The international popularity of shows influences "what kind of programming gets produced for domestic consumption in the United States and other countries that are active in the global market" (Bielby and Harrington 2008:54).

Further, although largely centered on the media industry in the United States, due to the configuration of international audiences, the impact of active users and user-generated content on the media industry can and should be analyzed from a global perspective (Bielby and Harrington 2008). Assuming that audiovisual products are immune to the reception conditions and are assimilated without filters by the receivers presupposes an extreme passivity on their part and overlooks any type of engagement. As postulated by those who oppose the view of cultural imperialism, even though the contents are produced in external realities "audiences play an active role in selecting the media they consume and the textual readings they make of it; those readings produce meanings that connect with the viewers' own social experience" (Bielby and Harrington 2008:41). For instance, when researching about soap operas around the world, Matelski (1999) found that cultural products are given meaning by the audience through their own local frame. Looking at the cultural effect of the incursion of live broadcasting of translational television in Belize, Wilk (2002) recognized that the internationalization of Belizean television did in fact took away some power from the national television and transferred it to the global system, in line with cultural imperialism. However, instead of affecting the creation of a national identity, this had a different effect:

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> Fashion and products from outside the country has lost some of their magic – they are no longer gifts from the future that carry a message of inevitability. Local products are seeing something of a resurgence because they are no longer pale imitations of the real thing, mimics stuck "behind the times". (Wilk 2002:182)

These are only examples of situations in which cultural imperialism does not produce the expected straightforward outcome signaled by some scholars. As pointed out by Bielby and Harrington (2008), more research is still needed to support these arguments. The forces involved in the production, distribution and consumption of audiovisual content are constantly shifting and the effects are hardly generalizable. In this protean media consumption environment, it is difficult to predict the effects that the users' or producers' actions may have. There is always the possibility of unfavorable repercussions for the receiving culture, but that is not the only possible case scenario.

Television producers have helped a great deal in the creation of the global audiences, and media in general have reinforced the feeling of an international consumption scenario. Producers and distributors are interested in keeping in contact with the audience and have embraced social media (Twitter profiles, Facebook pages, websites dedicated to shows and the fans) as a way to promote their products. Engaging the audiences through multi-platform strategies has become a useful strategy not only to create loyal viewers, but also to attract new ones. Along the same lines, local newspapers and magazines in different countries now report the news of the TV series and films even before the productions reach their own countries or local markets. In doing so, they recognize the importance the audiovisual products have in their readers' lives. Furthermore, reporting news on a given series or a film according to the original release schedule implicitly acknowledges that viewers have found workarounds to overcome the barriers and access the content before the official programming.

The Internet and the technological tools make it possible for the international audiences to stay connected at a global level and to share content. This connectivity solves the problems imposed by different geographical locations; it creates alternative distribution channels, parallel to the official ones. Nevertheless, the language problem still remains: for people in many countries to access the content, it is necessary to have it translated. To overcome this problem, communities have formed on the Internet to provide translations of the audiovisual content.

2.2.   Prosumers that become translators

The creation of alternative channels for distributing content confronts two main problems: geography and languages. Geographical problems have been solved mostly thanks to the technological developments that enable interconnectivity and have helped in the configuration of international audiences, as detailed above. Solving the language problem is more complicated, however, since the process of making translations is time-consuming and requires specific skills. Users have nevertheless learned to cope with this problem and cooperate in the production of translations that harness the distribution of content and broaden the audience for the products. By organizing themselves and exploiting the technological tools at their disposal, tech-savvy prosumers have turned into non-professional translators, willing to invest their time and effort in creating subtitles for other users in their countries or who speak their language.

The emergence of non-professional collaborative translation can be traced back to the 1980s with the start of fansubbing, before the advent of affordable and widely available technology. Fansubbing first appeared as an audience-based critique of the management and distribution patterns put in place by industry at the time. It developed as a revolutionary practice by fans in the United States who wanted to have access to more and uncensored anime (Japanese animated productions) in their own language (Leonard 2005). These fans were bothered by the cleansed results of mainstream translation and the small amount of content imported into the U.S.

The popularization of technological tools and easy access to the Internet made it possible for fansubbing to later spread to different audiovisual genres and other types of audiovisual content (e.g. comedies, dramas, action, thrillers, political activism) as well as other formats (feature films, documentaries, short films, TV series, interviews, etc.). The non-professional subtitling phenomenon grew thanks to the fans' realization that they can pool their efforts and assume not only the distribution but also the translation tasks.

When, at the beginning of the 2000s, international audiences started to become interested in TV series and films produced in the United States, new communities emerged that were dedicated to producing subtitles for these new products. They developed organization and production structures that resembled those of fansubbing communities. Different types of groups with different goals came together all around the world to create self-managed non-professional translation projects. The groups have

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formed around different factors, such as the languages they speak, the products they like or their geographical location. The distribution and positive reception of US-produced TV series caused these groups to multiply across countries, regions, and languages. In Latin America and Spain, the phenomenon prompted the development of non-professional subtitling groups who create translations from English into Spanish.

2.3.   Defining the audience: prosumers and lurkers

Non-professional subtitles produced on the Internet are the result of collaborative activities performed by prosumers organized in online communities. As part of the Internet culture, the non-professional subtitle scene is configured by fragmented subtitling groups. These communities bring together a number of collaborators and create systems of interaction. They are made of active consumers who are willing to devote their time and efforts to the tasks they set as a group.

The observation of online communities has shown that, regardless of the type of community and their shared goals, large-scale groups that rely on the production of user-generated content are actually sustained by the major efforts of a subgroup of its members. The degree to which the communities are regulated and the interaction among participants varies depending on their size and their evolution over time. They start, as a rule, as horizontally structured groups that allow free communication, but the refinement of the systems and the unbalanced growth of power force the development of hierarchically more complex systems (Pym et al. Forthcoming). The roles of participants in online communities are thus unbalanced. Their power within the group stems from the participants' abilities and the knowledge and products they bring to the community, and since some participants exert more power than others, different categories emerge.

Regularly, most members of these communities do not contribute in the content-production process: the largest part of the content is produced by a reduced portion of the members. Only highly-committed users participate actively in co-creational practices, which essentially means that these people work mostly as a leading subset that paves the way and makes it easier for others. Media scholars refer to this as the "90-9-1 principle" or the "1% rule". This states that 90% of the members participating in the discussion fora of a given community do not contribute but are rather observers and passive users of the content, they are known as *lurkers*; 9% of all members are

intermittent contributors, they collaborate from time to time and their participation accounts for about 10% of postings; and finally 1% of the members are considered *heavy contributors*, super-users whose participation produces approximately 90% of postings in the forum (Nielsen 2006; Ochoa and Duval 2008).

As a type of online community, non-professional subtitling groups can be understood in terms of this structure. Their activity coincides with this three-layered structure (Lindgren 2013). A general radiography (Orrego-Carmona 2011; Lindgren 2013) indicates that there is a group of occasional collaborators who are not highly engaged with the activities, a large group of lurkers who benefit from the translations, and a more structured and hierarchically organized main subgroup that operates as the staff, made of intermittent and heavy contributors who are highly committed to the functioning of the community. The framework of their activities is well defined and the objectives tend to be clear to the participants involved in the project and to general users. As a group, they act under a strict social code to decide on the activities they will carry out. Participation is on voluntary bases only: people are not rewarded monetarily for their time and effort. On the contrary, it seems that people participate in these communities mostly for self-fulfillment reasons, such as learning or improving linguistic skills in a foreign language, helping other people to have access to the content or simply achieving and maintaining a status within the group.

I am bringing this into the discussion because it gives a sense of how these communities operate. User-managed communities producing subtitles for films and TV series are set up, controlled and maintained by users in accordance with internally developed hierarchical structures, and their products are made available for the general public, lurkers. While it is true that lurkers do not participate directly in the creation of content, their passive presence in the group affects the actions of active users: they visit the community's website and benefit from the products, and in so doing, they create a need for these products and encourage the existence of the more active users. Without an increase in the number of participants, the groups would hardly cater for a pool of prospective collaborators large enough to finally take on the role of prosumers. Large communities are needed in order to filter the active consumers and ascertain the continuity of the group.

In this project, I address the reception of subtitles by an audience that can be identified with the lurkers of the subtitles produced by prosumers. I thus shift the focus from the producers to the consumers of subtitles, but I am not focusing on the

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prosumers themselves. The existence of a larger mass of lurkers, however, gives importance to the actions of those active participants, it gives them a reason to continue producing content and augments the impact they have on the established systems.

Chapter 3. Literature review

The previous chapter was dedicated to place non-professional subtitling as part of the larger prosumer manifestations in media workflows and the evolution of the media industry. In this chapter, I position the topic of this dissertation specifically within the field of Translation Studies. In Section 3.1 I briefly discuss the consequences of collaborative translation activities for our understanding of translation as a global activity. The other two sections review the research developed in two wide areas in which this thesis subscribed. In Section 3.2 I present the current state of the research concerning non-professional subtitling. To conclude, in Section 3.3, I offer a summary of the investigations that have dealt with the reception of translated audiovisual products.

3.1.   Collaborative translation

The development of non-professional subtitling has brought a wide list of issues into a shared discussion. The impact of collaborative practices on media-related environments has been studied comprehensively in Media Studies, as discussed in Chapter 2. Nevertheless, according to Pérez-González (2013:158), the studies analyzing the impact of technology on the global flow of media content have failed to account for the influence of translation in the bigger historical picture. As is often the case, translation plays a backstage role not only in the production processes but also in discussions about the factors that are affecting these processes and the way people engage with the resulting products.

Scholarly attention within Translation Studies is increasing and several studies on non-professional subtitling have been published over the past decade. In these publications, scholars have considered issues related to quality, politics, translation guidelines, and social implications (see Section 3.2). Interest has grown among researchers due to several reasons: on the one hand, scholars and professional subtitlers are concerned about the expansion of non-professional subtitling practices, and on the other, successful crowdsourcing initiatives have shown the possible impact of these models on the translation market. This reinforces the influence of user-generated content on translation flows and on the way *translation* is conceived as an object of study.

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According to Cronin, when the audience of the translation is the same group that is producing the translation, a consumer-oriented model of *internality* applies: "It is no longer a question of the translator, for example, projecting a target-oriented model of translation on to an audience, but of the audience producing its own self-representation as a target audience" (Cronin 2012:100). This new framework cannot be totally explained by most of the previous translation theories. The debate about the orientation of a translation, either towards the target or towards the source, does not apply when there is no external agent producing a translation to be consumed by unknown users. In that sense, when the one individual (or group of individuals) embodies different roles, our models need to be revised. In this case, it is the target, the end-user of the translation, who makes the decisions that will affect and tailor the translation. This imposes further changes to modes of translation that we have been trying to map for the past fifty years in Translation Studies. Further, it challenges previously defined concepts by adding a new social layer of actions and interpretations. Already in 2005, Tymoczko was talking about the consequences of the internationalization of translation, essentially the challenge to Western assumptions about the nature of translation and the need to reconsider those notions. Further, she was already signaling the important influence of technology:

> The world has begun another immense transition of this type that is changing translation, the transition associated with current developments in information technologies and the media, ranging from new mass media to the Internet, from CAT systems to translation imperatives associated with globalization. A major branch of translation research and theorizing in the next decades will respond to the changes in the conceptualization and practice of translation associated with this transition, and research in translation and reevaluations of the nature of translation both as process and product in the coming decades will inevitably focus on these changes. Research has already begun on these topics, but can only accelerate. (Tymoczko 2005:1088)

The areas of globalization and Computer Assisted Translation have been moving forward and the subsequent theoretical discussions have progressed, as pointed out by Tymoczko. However, the impact of non-professional translation, which in 2005 was not as developed as it is now, still calls for a more systematic attention with a special focus

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on its implications to Translation Studies. The future looks promising, with more solid and sound academic reflections that challenge previously defined orthodoxies already making their way into Translation Studies circles. Nevertheless, user-generated translation in general is a heterogeneous and protean phenomenon, so what applies in one instance may not cover another. This creates confusion and sometimes even contradictory situations. Time is needed before a comprehensive account of the whole non-professional translation panorama can actually be achieved, and perhaps more importantly, scholars should have an open mind, identifying the pitfalls of the practices while at the same time recognizing the value they may bring.

3.2.   Studies on non-professional subtitling in Translation Studies

The last ten years have been especially interesting for non-professional subtitling. On the one hand, non-professional subtitling communities have mushroomed and diversified over the Internet. Amateur subtitling has found different outlets and committed users have helped in the emergence and consolidation of the communities. At the same time, the emergence of studies on the topic has helped in the recognition of non-professional subtitling and amateur translation as a valid field of research in Translation Studies (Fernández Costales 2013).

The progress in the area has helped to narrow down the topics and has produced studies that are more oriented towards specific aspects. Thanks to the abundance of material and the easy access to it, case studies have been the most popular way to approach the subject. The sections that follow will introduce previous studies mostly following a chronological order.

Apart from considering the findings of these studies, we should assess the conditions under which they have been developed. The vision of non-professional subtitling as a disruptive practice traditionally prompted new researchers to embark on quality-assurance quests to uncover the mistakes in the translations or to be too cautious about the implications of non-professional practices, instead of considering the sociological or educational dimensions, among other possibilities. Although this view has changed in academia, in professional circles the discussion mostly turns on professional encroachment, ethics and legal questions. This is due to the fact that professional subtitlers and companies are now very concerned about proprietary regulations. Another relevant reason for this is the increasing relevance that the illegal

distribution of content over the Internet is gaining in the political agendas of various countries and international organizations.

3.2.1. Fansubbing as part of the fandom

Fansubbing, as the early manifestation of non-professional subtitling, was first approached in studies anchored in Asian Studies. Even today, fansubbing is still heavily associated with the non-professional subtitling of anime, as commented above. Scholars described fansubbing as a constituent of fandom. Some examples of this initial approach might be the article by the Asian Cinema professor and translator Nornes (1999), who labels fansubbing as *abusive subtitling* (in relation to the concept of *abusive translation* proposed by Philip E. Lewis), since it breaks the translation norms that had been generally agreed upon. Japanese Culture professor Napier (2001) discusses the main topics related to anime, taking a literary-critical point of view. Her book mainly deals with the general situation of fandom, but it also points out the level of engagement achieved by fan translators. Cubbison (2005), who is also interested in Fan Studies, explains the situation within a quest framework, where fans are struggling to have some say in the market decisions and the market has not yet defined if it wants to follow the fans' lead or, on the contrary, is trying to modify their preferences. Leonard (2005), an engineer and anime fan, presents a detailed review of the progress of fansubbing and the industrialization of anime.

Nornes is the only one who directly relates his discourse to Translation Studies and focuses specifically on the concept of subtitling in the fandom in a deeper analytical way. He argues that fansubs manifest what he defines as *abusive subtitling,* alterations of the mainstream *corruptive* subtitling techniques that have implications for the inertia of its accepted conventions and follow a more foreignizing approach. He states:

> There is a potential and emerging subtitling practice that accounts for the unavoidable limits in time and space of the subtitle, a practice that does not feign completeness, that does not hide its presence through restrictive rules. We must reconsider our own historical moment and work toward a subtitling that engages today's sensibilities with a violence which is not corrupt, but abusive. (1999:28)

Nornes describes *abusive subtitling* as being the regular practice in non-professional subtitling, but also in some uncommon cases of professional subtitling. The

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subtitlers' lack of formal training and their foreignizing approach motivate them to carry out the subtitling *by instinct* and give them the chance to use new strategies and to freely explore different modes of subtitling when trying to solve the problems they find.

3.2.2. *Initial descriptive studies*

At the same time as the above papers were published, studies on non-professional subtitling, or fansubbing, started to appear in Translation Studies journals and at conferences. Scholars mostly in the field of Audiovisual Translation published papers dealing with this topic from the mid-2000s. The focus of their initial take on non-professional subtitling was mainly the general description of the fansubbing activity and the structure of the fansubbing process, with the exception of Kayahara, who looks at the impact of DVD technologies and fansubbing.

Kayahara (2005) expands the reach of non-professional subtitling by pointing out that fansubbing was not restricted to Japanese-produced material only. His article explains that there are three main reasons that prompt the desire to produce fansubs:

> [A] desire to make minor films (that go unnoticed by the major distribution companies) more widely available to non-Japanese speakers; to have minor films noticed, and hopefully redistributed, by the major companies; and to make available a subtitled version where only a dubbed version exists. (2005:69)

Kayahara's article is especially important because, after presenting these reasons, he goes on to explain that the ease of copying DVDs might have a major impact on the fansubbing activity. He points out how technological empowerment could lead to the popularization of fansubbing for audiovisual material in a more general and broader sense. Kayahara argues that thanks to DVD storage capabilities, it is possible that "other genres will pick up on fansubbing, thus providing a more diverse field of source material for audiovisual translation theorists to work with, and raising the visibility of subtitling as a practice" (2005: 69).

Ferrer Simó (2005) focuses on user-generated translations of Japanese material: fansubbing and scanlation. With reference to fansubbing, she points out that fans prefer a product they can easily recognize as a translation, that is to say, a product reflecting the Japanese culture embedded in the source material. The article goes into a detailed analysis of both the technical and the linguistic characteristics and problems that are

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commonly presented in the subtitles produced by fans: number of characters per lines, lines per subtitle, synchronization problems, translation errors, spelling mistakes, location of the subtitle on the screen, etc. The characteristics of the fansubbed products are contrasted with the professional stand: most of them are considered transgressive and special emphasis is placed on translation errors and calques. Fansubbing is seen as a source-oriented type of translation that also includes glosses, is closer to the original, tends to be wordier and does not subscribe to mainstream standards. Due to these issues, the fansubbed versions as such are not given much credit, although they are given a cultural value and are considered a trigger for the decision to translate more anime.

Ferrer Simó (2005) also comments on the implications fansubbing could have on professional versions and the translation market. Since the fansubbed version normally predates any professional version, sometimes the audience is already inclined towards certain aspects in the translation (such as keeping names in the original language rather than adapting them). Professional translators are then required to align with these decisions in order to go in line with the audience habits.

Also taking a production-focused approach, Díaz Cintas and Muñoz Sánchez (2006) describe how human resources are allocated in the fansubbing production workflow and what the requirements to produce the subtitles are. They also describe the production process, detail technical requirements, and the human resources involved in the activity. The concordance between the division of tasks among fansubbing groups concords with the professional process of subtitling. The last section of the paper includes examples of translation errors. The authors state that "[g]iven the amateur nature of this translational practice and the languages involved, particularly Japanese, mistakes tend to be fairly common" (2006:47), and they present some examples of issues that commonly arise in fansubbing. They state that "[o]ne of the most interesting facts about fansubs is that translators know that they are addressing a rather special audience made up of people very interested in the world of anime and, by extension, in Japanese culture" (2006: 46). This encourages Japanese fansubbers to transgress the rules of formal subtitling: they argue that producing a more source-oriented version would help the viewers to approach to the source culture.

Díaz Cintas and Muñoz Sánchez (2006) comment on the different formats used for fansubbing and how the glosses used to add information or fill cultural gaps are rather challenging for readers, since a high amount of content is presented on the screen at the same time. Díaz Cintas and Muñoz Sánchez (2006) also comment on the

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possibility for mainstream subtitling and fansubbing to coexist in the same space. Fansubbing is seen as targeted at a specific audience that is more interested in the source culture and is willing to put up with having more information displayed on the screen at the same time. Considering this, the authors suggest fansubbing could become an alternative subtitle version that can be included in official DVD releases. This option was actually taken up by some distributors. For instance, in a study that will be reviewed later in this chapter, Caffrey (2009) explores the perception of DVD anime that includes optional glosses to explain culture references.

Díaz Cintas and Muñoz Sánchez (2006) dedicate a section to legal aspects. They mention some companies do not see any benefit in taking actions against fansubbing because they consider "free distribution of fansubs can have a very positive impact in the promotion of a given anime series in other countries" (2006:44). They also comment on the different types of copyright law and the difficulty to launch any international prosecution against the groups. Additionally, they argue it is possible to see the fansubbing activity as another instance of the *fair use* permitted by the copyright law, as recently commented by Casarini (2014). They conclude by reinforcing the more orthodox view on fansubbing: "in the end, regardless of ethics, or motive, fansubs are technically illegal" (Díaz Cintas and Muñoz Sánchez 2006:45).

Pérez-González (2006) explores various features of the fansubbing process and analyzes them in contrast to the regular rules followed in the mainstream subtitling practice in commercial industry. He criticizes the partial approach that previous studies (Kayahara 2005; Ferrer Simó 2005) have taken when appraising fansubbing practices as having an impact on translation only and argues that the potential propagation and implication of fansubbing have been considered "exclusively by recent developments in the audiovisual translation industry, rather than the media industry as a whole" (Pérez-González 2006:277), leaving aside the repercussions that Web 2.0 has had on fan and viewer interaction with the production side of the industry. Pérez-González points out the relevance of the fan-technology relation to different fields of translation activity. He further argues that active consumers have used technology to start changing the previous decision-making process in the whole media industry. Pérez-González's approach takes the discussion into a dimension that is embedded in the Media Studies context described in Chapter 2 above. He states that user-producer interaction in the current situation and the new consumer initiatives indicate that "the power of media consumers is set to grow further in the future" (Pérez-González 2006:275). Hence, to

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gain real insight into the fansubbing phenomenon, it is appropriate to visit the common grounds of media and the language industries to develop more solid basis for advanced studies.

In a subsequent article, Pérez-González (2007) revisits the most specific differences between non-professional subtitling and professional subtitling, and he presents one of the first empirical studies on fansubbing to use a sample corpus. He relies on a multimodal theoretical framework as the methodological strategy to evaluate the state of fansubbing conventions. His analysis goes throughout the corpus describing how the fansubbing techniques transgress, modify or enlarge the most-accepted techniques of mainstream subtitling. The aim of such detailed analysis is to examine how "one of the most consolidated emerging subtitling cultures is contributing to the evolution of subtitling practices" (2007:78) by exploring new possibilities and exploiting the range of possible options offered, using different fonts, colors and location on the screen. The development of the technological means that are accessible to the non-professional subtitlers makes it clear that "the rationale for the use of audiovisual translation in the near future is likely to become more heterogeneous, less predictable" (Pérez-González 2007:77). In this sense, Pérez González's view coincides with the perspectives on the influence of technology presented by Tymoczko (2005). However, with some specific exceptions, it could be said that this renovation of mainstream subtitling based on the characteristics of non-professional subtitling has not really taken off, and it does not seem to be just around the corner.

3.2.3. *Non-professional and professional subtitles from a professional point of view*

Fansubbing has experienced an exponential growth over the last decade. Non-professional subtitling websites with audiovisual material other than anime have been created all around the world and have produced subtitles for both licensed and non-licensed films and TV shows. The spectrum of user-generated subtitling has broadened and so has the field of study. Empirical studies analyzing quality issues have been carried out by scholars looking at different language pairs and at the translation of non-anime products, including Bogucki (2009), La Forgia and Tonin (2009) and Feitosa (2009).

Discussing *amateur subtitling* rather than fansubbing, Bogucki (2009) analyzes the errors in the amateur translation of *The Fellowship of the Ring* into Polish. The

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inferior quality offered by the non-professional subtitles is stated at the beginning of the article since, according to the author, "the product under discussion does not qualify as fully-fledged subtitling" (Bogucki 2009:49). Bogucki argues that quality assessment is not merely about error-hunting, but his revision is restricted to 15 *errors* found in an amateur version released six weeks prior to the official release of the film in Polish in 2001.

The error analysis presents a linguistic assessment of the non-professional subtitles, which allows the errors to be connected to a certain production condition in the translation process. Bogucki clearly states that non-professional subtitling is guided more by instinct than by reliance on the subtitling standards agreed within subtitling industry:

> The problem with amateur subtitling lies not so much in squeezing the gist of what the original characters say into 30 or so characters per line to enable the audience to appreciate the filmic message without too much effort; the problem, it seems, lies mostly in the quality of the source material and the competence and expertise of the translator. (Bogucki 2009: 50)

Bogucki argues it is impossible to compare professional and amateur subtitling since the production conditions of both differ enormously, particularly considering that "the product of amateur subtitling tends to be marred by translational error due to the translator's lack of linguistic competences in the SL, incomplete source texts, or both" (2009:56). As long as amateur subtitling continues to be produced under such extenuating conditions, it is not a threat to professional subtitles and is not worthy of becoming a topic for research. *Home-made* subtitling would need to be produced under more professional conditions and would require to be performed by more capable people before:

> [T]he resulting target text can be subject to translation quality assessment and compared to professional cinema subtitling. Then – and only then – can it be studied by academics and scholars. If, however, amateur subtitling continues to be done on the basis of incomplete information, it will necessarily also be imperfect and not available to academic study due to its high degree of unpredictability. (Bogucki 2009:56–57)

A very similar approach to that of Bogucki is taken by Sajna (2013). He relies on a corpus of eight feature films to carry out an error analysis of non-professional subtitlers from the perspective of professional subtitlers. Using a typology of translation errors developed by Hejwowski, Sajna shows how all instances of these errors can be found in the non-professional version. Instead of exploring the new insights brought about by non-professional subtitling (Pérez-González 2006), this type of study tries to fit non-professional activities into the mold of professional subtitles.

Unlike Bogucki and Sajna, I consider non-professional efforts are valuable particularly because they show there are alternatives to professional standards. As pointed out by Nornes (2007), mainstream subtitling is part of a wider media system whose main interests might not coincide with those of non-professional subtitlers. I posit that the possibilities of these practices are a ripe environment for innovation that is not allowed within accepted orthodoxy and that could help move forward not only audiovisual translation but also the way we conceive translation in general.

In his reflection on non-professional activities, Sajna (2013) does provide an interesting consideration regarding the expansion of fansubbing. He argues *fansubbers* should be *fans* of the products they translate in order to be called so, and contends this is no longer the case for many communities. There are non-professional subtitlers who "appear to be fans of translation and to have fun engaging in the very activity of subtitling films" (2013:3). Thus, Sajna labels these translators *funsubbers*. The popularization of non-professional subtitling and the expansion of the phenomenon have actually made this the rule rather than the exception, as similar considerations can be found in previous works by Dwyer and Uricaru (2009) and Orrego-Carmona (2011).

Feitosa (2009) presents a systematic study comparing professional and non-professional subtitles. By applying corpus studies methods, he compares Brazilian Portuguese *commercial subtitles* and *pirate subtitles*. No differences in terms of number of lines were found in the corpus, and the mean duration for subtitles was the same for the professional and the non-professional versions. Non-professional subtitles turned out to be wordier than the professional ones. Feitosa found an explanation for this in the forums, where subtitlers commented on the fact that these subtitles are an alternative to the commercial ones and that the translation is longer and closer to the original (in the sense of number of words) because people want to know "tudo que os personages falam" [everything the characters say] (2009:66). Consequently, omission, reductions and condensations were more common in the commercial subtitles than in the non-

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professional versions. Feitosa (2009) concludes it is not possible to say one version is necessarily more adequate than the other, since the differences seem to respond to 1) the different ways of expressing a message, and 2) the approach taken in the research and the annotation system of the corpus.

The Italian non-professional subtitling sphere is very active and has been explored extensively. Barra (2009) talks about the general Italianization of US series and dedicates a section to non-professional subtitles. The expansion of the non-professional subtitling activities goes back to the release of the series *Lost*, which caused a massive growth in the communities. Barra describes something similar to what Pérez-González (2013) later labeled the *remediation* of the subtitles: non-professional subtitles make themselves visible and identifiable to the users. Echoing Díaz Cintas and Muñoz Sánchez (2006), Barra mentions that this is possible because non-professional subtitles, unlike their professional counterparts, aim at a reduced audience of fans with shared interests. This does not mean that there is no regulation: as he claims, the amount of time non-professional communities have been operating indicates that "in recent years they have evolved production routines, roles and tasks becoming more and more similar to professional dubbing (Barra 2009:521).

In another case study, La Forgia and Tonin (2009) make an analysis of how inter-textual references are handled in the official Italian and Spanish dubbed and professionally subtitled versions, as well as the fansubbed versions of the TV series *Supernatural*. The decision to include fansubbed versions in the study responded to the assumption that they are intended to be more *loyal* to the original version. Fansubbers are more favorably inclined towards source-oriented translations that are also more liberal regarding the inclusion of taboo words. The results, however, were different to what was expected:

> [T]he fansub translations, in general, are of much lower quality than the official translations. First, this is due to the lack of linguistic and pragmatic competence we found in many cases, and second, because they tend to overlook the function of intertextual references, hence treating them as mere linguistic and not cultural "facts", which leads them to translate (not always adequately) only the linguistic form, losing the cultural component. (La Forgia and Tonin 2009: my translation)

Massidda (2012) describes the two largest non-professional subtitling communities and compares the subtitles they produce to professional DVD subtitles. As in other places, the non-professional activity in Italy has had a significant impact on television. The two non-professional subtitling communities analyzed, *ItaSA* and *Subsfactory*, have penetrated deeply into the country's tradition and their work has caused television channels to reconsider some of their choices in terms of translation of popular TV shows and delays in the distribution of new content. Massidda found that non-professional subtitles have refined over time. They follow previously established standards in terms of length of subtitles and have even achieved good spotting, one of the most neglected aspects in non-professional subtitles. There are occasions on which the official DVD version resembles the original, as pointed out by Barra (2009). Surprisingly, when analyzing one episode in her corpus, Massidda found that the original version had more inadequate renderings than the non-professional counterparts. Demonstrating that professionals and non-professionals are still considered to be ruled by dissimilar directives, Massidda argues "[w]e might of course accept such erratic and unpredictable behavior if it had been found in the translation carried out by fansubbers, but we would certainly not expect this level of inaccuracy on the part of professional translators" (2012:159).

Also in Italy, Casarini (2014) analyses the changes of Italian viewership through the framework of the globalization of non-Anglophone viewership and the evolution and adoption of audiovisual translation practices, namely dubbing and fansubbing. Claiming that the changes in the viewership as well as in the consumption and production habits are irreversible, Casarini suggests the audiovisual industry in Italy should reassess its strategies to respond to the needs of a more engaged and active audience. Casarini argues that, although non-professional subtitling communities do not aim at invading the space gained by dubbed products, their existence creates an alternative for the audience and alters the status quo. Some of the advantages of fansubbing are that it permits more interaction among viewers and allows for the emergence of viewership 2.0. Under these circumstances, the dubbing industry should, Cassarini claims, "assimilate the greatest lesson offered by fansubbing, which is how to cater to evolving audiences by focusing on the specific traits of each show and learning how to navigate the paths of intertextuality" (2014:21).

With respect to this evolution of audiovisual translation, Casarini says that the context of video consumption in Italy might benefit, in the future and given the proper

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disposition of audiovisual translation providers, from a convergence between dubbing and non-professional subtitling. A model that integrates the renowned features of the Italian dubbing industry:

> such as dialogue fluency, careful synching, and powerful voice-acting, […] combined with the less domesticating approach and the deep knowledge of each show's specificity that are typical of fansubbers. Hiring the latter (or particularly conversant fans) as consultants would allow adaptation teams to benefit from a collaborative epistemic pool that is imperative in the contemporary scenario (Casarini 2014:285).

This proposal takes the discussion forward and focuses on the now commonly mentioned co-existence of non-professional activities and mainstream audiovisual translation modalities.

Wilcock (2013) provides another study of non-professional subtitling that compares DVD subtitles with non-professional subtitles. In this case the original language is French and the target language is English, unlike in most of the previous cases in which the source content is either in English or in Japanese and uses English as a pivot language. In her study, as in previous cases, Wilcock found the non-professional version to be more source-oriented, retaining more elements from the source version and displaying a more complete rendering of the dialogues. However, she explains this in terms of the translations being suited to different needs, as pointed out by Díaz Cintas and Muñoz Sánchez (2006) and Barra (2009), among others. The fact that the non-professional translation has a self-selected and characteristic audience implies that those subtitles are operationalized for them: "For the fansubbers, communication is tailored towards an audience with some background knowledge, and that is willing to make more effort in order to understand cultural references" (Wilcock 2013:108).

3.2.4. *Profiling the subtitlers*

One aspect that has also become attractive for researchers is the identity of the non-professional translators and why they are doing these translations. Although several small-scale studies have been carried out, I am going to reference some of the largest that have tried to profile non-professional subtitlers. In his Master's thesis, Kreb (2011) sets out to investigate the landscape of the Dutch non-professional subtitling

community. Most of the respondents were men with an average age of 33 years, living in the Netherlands and Belgium. The majority of the respondents said they produce subtitles because of personal reasons, but only half of them see subtitling as a hobby. Unlike other non-professional communities, more than half of the participants said they would accept or at least consider accepting a paid subtitling job. Community building was also one of the reasons most commonly given by participants as an important aspect of their subtitling activity: the respondents saw their fellow subtitlers as friends. The questionnaire also asked the participants about their degree of agreement with the subtitling guidelines included in Díaz Cintas and Remael (2007), and most of the participants said they agreed with the guidelines. However, as no subtitles were analyzed in the study, it is impossible to know to what extent the guidelines were actually adopted.

Chu (2012) reports on a survey of Chinese fansubbers. In total, 80 respondents completed the questionnaire. The findings indicate:

> that young, well-educated, urban Chinese are using fansubbing as both a form of serious leisure and a learning platform, which helps to account for the altruism and volunteerism they display in their highly commercialized and competitive everyday lives. (Chu 2012:274)

As suggested by smaller scale studies (Orrego-Carmona 2011), Chu found that most non-professional subtitlers take on translation activities as a hobby and do not seek monetary reward, not even in the future. The respondents emphasize they operate in what we might call an interculture and they acknowledge language-learning rewards and altruistic motivations. Among the respondents, there is also a high degree of commitment to the community and an atmosphere of camaraderie in the group.

In a similar study, Luczaj et al. (2014) surveyed the Czech and Polish non-professional subtitling communities. They collected 68 questionnaires in the Czech Republic and 40 in Poland. As in Chu's study, most respondents were well-educated, tech-savvy, young urban people. In both countries, most of the respondents were men. They found variations in the methods of working in the two countries: Czech translators were found to work mostly in groups, while the Poles seem more individualistic and did not see themselves as a community. The respondents also claimed they enjoyed creating the subtitles and felt they were doing something useful for other people. The subtitlers

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in the Czech Republic were found to be more likely to meet other subtitlers in person, while a high number of Polish non-professional subtitlers did not know any other subtitlers.

3.2.5. *Studies on specific non-professional subtitling features*

There has been an assumed relationship between non-professional subtitling practices and censorship. Overcoming government and industry control implies that subtitlers are not constrained by external regulations. In an account of the audiovisual translation panorama in Romania, Dwyer and Uricaru (2009) introduce the work of a non-professional subtitling group in the country. After commenting on the effect of censorship and user-generated translation in Communist Romania, non-professional subtitling is shown to be a part of the Romanian piracy context. The authors refer to a group that produces subtitles for foreign content.

Interestingly, after describing the regular features of fansubbing communities, Dwyer and Uricaru emphasize that the group they are describing "mirrors the activities of anime fansubbing networks […] yet with one essential difference: they are fansubbers pure and simple in that they are actually fans of subtitling itself rather than of any particular genre or product" (2009:50). They make a distinction between fansubbing being genre-specific and the other groups who more generally provide non-profit translation for foreign media. Dwyer and Uricaru's reasoning concords with Sajna's claim about the difference between *fansubbing* and *funsubbing*, which stresses the different reasons to participate in non-professional subtitling activities.

Moving away from the actual subtitles and focusing more on non-professional subtitling communities as systems, Hemmungs Wirtén (2012) presents an account of a 2009 strike of fansubbers in Sweden. The paper explores the interactions between various non-professional subtitling communities with respect to international copyright, but it does not focus on the fans' infringement of the copyright laws in detriment of the audiovisual content copyright holder: it focuses instead on fan-to-fan piracy.

An administrator of a non-professional subtitling website in Sweden was appropriating the subtitles produced by the competing groups by taking them and removing any reference to the original translators before posting the subtitles on his own website. The original creators of the subtitles were not concerned about the redistribution of content, which is a regular practice among non-professional

communities, but were instead disturbed by the fact that they were stripped of their authorship and no longer recognized as producers. Unexpectedly, the wronged subtitlers decided to do what a union would do and went on a strike, so that the distribution website would not have new subtitles coming in for newly released shows. The discussion about authorship is presented from various perspectives, with some groups of non-professional subtitlers considering it important for individuals to be recognized as authors and willing to articulate a defense of their rights, while another group argued it was the group as such that should be identified as the author, not the individuals.

This is hardly surprising. Since non-professional subtitlers do not receive monetary payment for their work, they develop a high degree of attachment to their products. Being recognized as translators of their subtitles is their reward for their work. Their motivations are mainly personal (Kreb 2011; Luczaj et al. 2014) and the visibility they have as translators is valuable to them. Hemmungs Wirtén draws links between this situation and the discussions that led to the Berne Convention and its revision. Once again, translation is found at the center of the discussion, but more importantly, even in a paraprofessional activity that is often judged as *illegal*, the concept of *author* remains central and the debates about authorship, control and piracy are still current.

Also commenting on transformative and authorial practices, Pérez-González (2012) analyzes the co-creational practices occurring in non-professional subtitling. Pérez-González sees the emergence of *transformative* subtitling practices as a result of the de-legitimization of industrial subtitling. Presenting industrial subtitling as a self-effacing activity, he argues that:

> By smoothing over cultural differences on the grounds of medial constraints and hiding their presence through restrictive rules, corrupt subtitles fail to explore those spaces of generative cultural and linguistic multiplicity that emerge in any instance of cross-cultural transaction. (Pérez-González 2012:5)

The constraints to subtitling are harnessed by the regulations of the industry. However, emancipated collaborative translation practice is not subjected to industry constraints and "often involves a re-positioning of the text within the geography of the frame, a shift from a representational to an interventionist agenda that erodes the privileged status of the original text" (Pérez-González 2012:6). Using fansubbing as an example, Pérez-González explores how consumers and producers of fansubbing differ

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from other audiences in how they engage with content. Fansubbers have developed their own standards and voluntarily position themselves outside of the mainstream flow. The fansubber's intervention is seen as means to *remediate* the product and augment the original text.

This time focusing on the implications of non-professional subtitling for online citizenship, Pérez-González (2013) shows how the democratization of technologies, in this case the ones involved in subtitling, promotes radical citizenship responses. The article explores the role of activist non-professional subtitlers in the circulation of media content and the participatory media environment. Building on the theories of co-creational practices, Pérez-González analyzes the case of a group of activist non-professional subtitlers who distributed subtitled footage featuring Spanish Prime Minister Aznar's ultraconservatist views. Pérez-González's account of civic engagement through subtitling constitutes another layer of non-professional subtitling that has not been completely covered. Non-professional subtitling gains the role of an act of resistance not only against media corporations but also in the face of political discourses that are strictly controlled. The type of subtitles produced by the community are also an instrument of *remediation* of media content. According to Deuze (2006), remediation is the remix of *old* and *new* media. Active users remediate when they adopt old media strategies or products but manipulate and modify them according to their ideas in order to create a new reality. This is often the case with fansubbing (Pérez-González 2012). These non-professional subtitlers want to "make their presence felt" and openly voice their own opinions about what is being said in the video. They distance themselves purposefully from mainstream practices, not to bridge cultural gaps but to specifically embed themselves into the resulting content.

Dwyer (2012) offers a thorough account of a start-up company, ViKi, founded around non-professional subtitling. ViKi started translating Korean programs but has grown to include many other genres. The company capitalizes on technology affordability and collective intelligence to break international boundaries and alter the media distribution system. The popularity of the website caused it to grow exponentially and reorganize itself in the form of a full-fledged monetized company. The main innovation of the group is its online software that allows subtitlers to collaborate in the translations and interact in real time. In many senses, as pointed out by Dwyer, ViKi cannot be understood in the same way as other non-professional subtitling communities. Like previous authors, Dwyer comments on the need to move forward from the concept

of *fansubbing* and include translation for other genres from all over the world. ViKi disrupts the traditional Western focus of translation and "brings to the world media content from small language-communities, developing countries and Asian superpowers alike – including, among others, Bangladesh, China, Egypt, Iran, Laos, Mongolia, Nigeria and Turkey" (Dwyer 2012:231).

Interestingly, the growth of the community has also had an effect on the subtitles, which have become more similar to mainstream subtitles. This not only concerns the layout of the subtitles, but has also caused ViKi's subtitlers to adopt more domesticating techniques, which is clearly an exception within the context of non-professional subtitling communities.

Although ViKi has adopted a more commercially oriented business model, the profile of its members is similar to those observed in other communities: "ViKi fansubbers belong to the same tech-savvy, cyber-elite demographic typical of other fansub communities. Their interventionist involvement in the media marketplace is dictated by matters of geography, language, economics, market size and legality" (Dwyer 2012:234).

Izwaini (2014) comments on instances of non-professional subtitling in Arab countries. Subtitling is not only used to translate content but also to create parodic translations, similar to the cases presented by Pérez-González (2013). The content translated is of different kinds, from cartoons to religion, and while most of the content is translated from English, there are also other Middle Eastern languages involved. One practice that is commonly used is relay translation: videos are subtitled using English as a pivot language. Izwaini stresses that non-professional Arabic subtitles tend to be written in a rather colloquial register and, since they are not censored, they "tend not to mitigate strong language by choosing less offensive expressions" (Izwaini 2014:103). According to him, the quality of non-professional subtitles is normally low and non-professional subtitles are not in competition with professional translations. However, he recognizes there are different levels of quality, and claims this could depend on the genre, with political and religious texts demonstrating a higher degree of quality. At the same time, it could also depend on the translators, since individual projects tend to be of lower quality than translations published by organized non-professional subtitling groups that have set their own internal quality assurance process.

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3.2.6. *Conceptualization of non-professional subtitling and translation*

In cases such as mine, monetary reward is taken as the decisive factor. O'Hagan (2011) argues that some scholars prefer to focus on other aspects, such as philanthropic motivations, as the central element to define community translation.

Due to the nature of fansubbing and its status as the oldest mode of non-professional subtitling, it is not uncommon for scholars to refer to all types of non-professional subtitling in general as *fansubbing* (Barra 2009; Massidda 2012). However, the expansion and proliferation of non-professional subtitling activities makes it imperative to adopt a broader definition to refer to the creation of subtitles by people (Dwyer 2012). It is no longer the case that everyone who participates in these endeavors can be labeled a fan of the product when, for instance, some people create subtitles regardless of the content, merely for the fun of it (Orrego-Carmona 2011; Sajna 2013).

Referring to the broad area of non-professional translation, O'Hagan (2009) resorts to the concept of user-generated content and proposes the term *user-generated translation*. She describes the term as "a wide range of Translation, carried out based on free user participation in digital media spaces where Translation is undertaken by unspecified self-selected individuals" (O'Hagan 2009:97).

Positing that the central difference is the lack of monetary reward, Pym (2011) suggests using *volunteer translation* and argues it is the natural opposite to professional translation. The term, nevertheless, suggests an activist meaning and brings a political agenda into discussion – volunteers are normally called to offer their service for a cause they believe in. Although some instances of non-professional translation fit into this description, there are other types of non-professional translation that, as explained by O'Hagan, "are embedded in strict commercial contexts applied by for-profit organisations that are generally devoid of such political agenda, which cannot be said of cases of fan translation and its variants" (2011:14). Recognizing the complications of settling on an umbrella term for the phenomenon, O'Hagan herself relies on the label *community translation* to refer to the set of practices that are tied to online communities within the Web 2.0 context. She argues that the term nevertheless requires clarification because it can be confusing due to its multiplicity of meanings, such as the natural link to community interpreting. In her view, the medium and the structure of the groups producing the subtitles determine the label to use.

Fernández Costales (2012; 2013) uses both *collaborative translation* and *community translation* as umbrella terms to refer to cases in which translation is done by unpaid groups of people motivated to work together towards a common aim and whose operations are mediated by technology. Using these two terms is a consequential choice, since the more detailed characteristics that define the differences between the practices, such as who the initiator of the translation is and whether the translation is paid or not, emerge at a more advanced level. Both professional and non-professionals can work collaboratively and normally partake in translation communities, so these labels allow for a recognition of the points they have in common. Fernández Costales (2012:121) differentiates between *crowdsourcing* and *community translation*. Crowdsourcing initiatives are coordinated and put it place by a company, while collaborative translation projects are initiated and completed by the translation communities themselves. Nevertheless, looking at the mechanisms used by many crowdsourcing projects, it is clear that these groups also tend to form communities and work in collaborative ways in order to complete their tasks.

Gambier (2014) talks about communities but does not refer to community translation. He offers a typology with five different categories of translation practices: *machine translation*, *amateur translation*, *collaborative translation (teamwork)*, *translation with open source tools* and *volunteer networked translation*. The classification seems somehow arbitrary and leaves room for discussion. In Gambier's explanation of collaborative translation, the activity is restricted to professionals only:

> Collaborative translation (teamwork) that is carried out on a same, single document by professionals places dematerialized computer resources at the common disposal of all. This includes document research, terminology, re-reading and revision. It is manifest in such sites such as Proz, Translator's Café, etc. "Cloud" cannot be confused with "crowd". (Gambier 2014:4–5)

However, as touched upon above, teamwork is not only restricted to professionals. Additionally, some non-professional platforms actually follow patterns comparable to those of Proz or Translator's Café. The categories overlap and respond to different classification features: some are defined by the type of tools used while others refer to the communication and organization of the people doing the translation. This creates conflicts since, depending on the case, the hierarchy can be easily changed and

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one concept could include the other or at least be at the same level. For instance, *collective translation* (including crowdsourcing) is considered a branch of *amateur translation*, totally independent from *collaborative translation* even though the mechanisms are very similar in both.

Non-professional subtitling is a controversial topic. When it comes to the discussion of the subtitles as such, there are scholars who question the very nature of non-professional subtitling and do not see it as a proper concern of Translation Studies unless it adopts more professional standards (Bogucki 2009; Cornu 2013; Sajna 2013). Others are still cautious about quality issues (Díaz Cintas and Muñoz Sánchez 2006) and its possible implications for the translation profession (Cronin 2012; Fernández Costales 2012). However, the current response to the phenomenon is generally positive. While not promoting wholesale adoption, some scholars think that acknowledging non-professional subtitling can actually benefit the audiovisual translation industry in different aspects (Pérez-González 2007; O'Hagan 2008, 2011; Dwyer 2012). Non-professional subtitling is seen as a driver of innovation in audiovisual translation, encouraging collaboration methods rather than individual translation enterprises. It highlights the relevance of translators being content or genre experts who take a holistic and rather foreignizing approach to translation, against the domesticating mainstream preference.

O'Hagan's claim that "Translation Studies can no longer afford to overlook the fan translation phenomenon" (2008:178) seems to be partially vindicated. Researchers in Translation Studies have embarked on the mission of exploring user-generated translation on different fronts. Although still highly concentrated in the audiovisual translation field, non-professional translation is being discussed and researched and, judging by the increase in the number of publications in recent years, this trend is likely to continue.

In this review I have focused almost exclusively on works studying non-professional subtitling. We clearly now know more about the people making the subtitles, how they organize themselves and the impact they may have on the distribution of content. Additionally, we know about the subtitles as cultural products and how they compare with their professional counterpart. That is only one part of the picture, however. The landscape of user-generated translation is much richer and more complex. It ranges from the study of ethics (McDonough Dolmaya 2011a) and its comparability to professional codes of ethics (Drugan 2011) to the impact of

crowdsourcing on translation practice and translators (Mesipuu 2012; McDonough Dolmaya 2012; Fernández Costales 2012). One aspect that is becoming more interesting for researchers is the motivations that prompt people to participate in user-generated translation endeavors (McDonough Dolmaya 2011b; Olohan 2014). Those issues concern production. Less research, however, has been focused on reception.

3.3.   Research on reception

3.3.1. *Exploring the viewers' reception of translated audiovisual products*

The relevance of reception studies has been discussed in audiovisual translation studies since the 1990s. Most of the works published over the past decade have echoed Gambier's (2003; 2008) words on the lack of studies dealing with reception:

> Very few studies have dealt with the issue of reception in screen translation, and even fewer have looked at it empirically, even though we continually make reference to readers, viewers, consumers, users, etc. (2003:184)

Although reception was already part of the picture of audiovisual translation in the early stages of the boom of empirical studies in audiovisual translation in the 1990s (Kovačič 1995), the study of reception in Audiovisual Translation, specifically, and in Translation Studies, in general, has not really taken off (Brems and Ramos Pinto 2013). The main reasons for the lack of studies are the difficulty of defining what *reception* is, the large samples required, and the difficulty of generalizing the results. In order to define some common ground, Chesterman (2007) proposes a set of terms that will provide a causal model for the understanding of translation effects and help define reception. Chesterman argues that translations cause *reactions, responses* and *repercussions*. These categories, which are not restricted to translation effects only, were adopted by Gambier and brought into audiovisual translation studies.

On the bases of Chesterman's discussion and Kovačič's (1995: 376) descriptions of the different levels of reception, Gambier (2006; 2008; 2012) presents a model that he labels as the *3 Rs* (reactions, responses and repercussions). This is a comprehensive way to distinguish the different levels of reception of translated audiovisual products. The framework analyzes *reactions* on the psyco-cognitive level, *responses* on the perceptual level, and *repercussions*, which are understood in two distinct ways: as an

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attitudinal issue, in terms of the viewer's preferences and habits, and also as the "socio-cultural dimension of the non-TV context which influences the receiving process" (Gambier 2006:22).

Recent years have seen an increase in the number of studies exploring audience reception. Most of these have focused on subtitling and accessibility, but some include other modalities of audiovisual translation as well. Along with the broadening of the literature, there has also been a development in the methods used to explore audiovisual translation reception. This section will report on reception studies, highlighting the methods researchers used, the topics they were exploring and their main findings.

3.3.2. *Empirical studies on audiovisual translation*

In their review of studies that have assessed the effectiveness and the effects of subtitled material, de Linde and Kay (1999:35) propose a typology that serves to understand the landscape of research in audiovisual translation studies dealing with reception:

- Survey method: "eliciting viewers' responses to questions about their experience of subtitled television"
- Semi-controlled experiment: "looking at viewers' responses to different sets of pre-categorized subtitles"
- Controlled experiment: controlling "both medium and viewer in order to gain precise behavioural information about how particular subtitle characteristics are received".

The use of survey methods has not been the preferred approach within Translation Studies. It consists of large-scale studies aimed at defining the general preferences of audiences. As such, this type of research has fallen to government agencies, national TV agencies, TV channels, distributors and audiovisual material providers. Some examples could be the reports published by Ofcom in the United Kingdom or, more properly speaking, the studies on the dubbing and subtitling industry (2007) and on the use of subtitling in Europe (2011) that the Media Consulting Group has carried out for the European Commission.

Semi-controlled and controlled experiment methods have been more popular among Translation Studies researchers, due to the more detailed information they provide. In the former, the researchers define the specific features of the audiovisual product or translation they are interested in and check the effects these features have on

the viewers. This method differs from the survey method in maintaining the same variables for all participants. The controlled experiment methods, apart from controlling the input that is used, also record the "actual motor behaviour" (de Linde and Kay 1999:37) of the users. Linde and Kay talk specifically about recording eye movement, but there are other biometric possibilities such as heart rate, skin conductance and EEG measurements. With these methods, researchers normally resort to questionnaires as the means to elicit the viewers' reactions and opinions. Questionnaires are time-efficient and allow access to a large number of responses in a short time. The combination of questionnaires and eye-tracking data is becoming more and more popular, but researchers have also used direct observation, interviews, focus groups, and tasks to collect data on reception.

3.3.2.1. Studies in Leuven

Eye-tracking methods have been part of research on reception of translated audiovisual content for a long time. Much of the research carried out in the area since 1980s was performed under Géry d'Ydewalle and his colleagues at the Katholieke Universiteit Leuven (d'Ydewalle et al. 1985; d'Ydewalle et al. 1987; d'Ydewalle and van Rensbergen 1989; d'Ydewalle et al. 1991; d'Ydewalle and Pavakanun 1995; d'Ydewalle and Van de Poel 1999; Bruycker and d'Ydewalle 2003; d'Ydewalle and Bruycker 2007). In an eye-tracking experiment, d'Ydewalle et al. (1985) found participants do not read the subtitles in their entirety: "They first look at the visual image, jump quite accurately to the keywords of the subtitle (i.e., the words conveying the most important parts of the conversation) and then go back to the visual image." If there is time left, some participants return to the subtitle area and read the entire subtitles. Subsequent studies (d'Ydewalle et al. 1987) found subtitle reading to be a more or less automatic behavior: viewers cannot avoid reading the subtitles when they are shown on the screen, even when they understand the source language. Further, their research shows that shifting attention between the image and the subtitles is effortless for viewers. These initial reports do not offer a complete description of the experiment, and in some the number of participants or the details of the translated audiovisual product are not included, which complicates the interpretation of the results. Nevertheless, the findings served as the foundation for future studies. They demonstrated that people look at the subtitles and indicate there is a degree of automation, rather than a thought decision, in the reaction to the visual input. The

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researchers used these studies to formulate hypotheses that were tested in other experiments. d'Ydewalle and van Rensbergen (1989) report on an experiment with children and show that subtitle reading depends on the type of content and is not a fully automatic action. When watching a cartoon with a heavy verbal load, children had gaze patterns similar to those of adult viewers, but when they were watching an action-oriented cartoon, they relied less on the subtitles.

In yet another study, d'Ydewalle et al. (1991) tested the use of intralingual subtitles among English native speakers not used to subtitling and Dutch native speakers who were used to subtitling. Both groups spent a considerable amount of time in the subtitles, which seemed to indicate that participants who are used to subtitling look at the subtitle area even if they understand the spoken language and regardless of their familiarity with subtitles. However, on this occasion, the researchers found there was a degree of control in subtitle reading, even if it coexists with a more common automatic behavior. Using news broadcast as input, d'Ydewalle and Gielen (1992) found viewers look longer at the subtitle area when the audiovisual product conveys a lot of information in a short period of time. The participants looked at the subtitles at a faster pace and for a longer period of time, even when the news broadcast was in their own language. Further, the findings support the idea that reading subtitles on the screen is effortless and an almost automatic behavior.

Koolstra et al. (1999) study the applicability of the six-second rule. By setting up an experiment in which subtitles were shown at three different speeds, (6, 8 and 10 seconds per subtitle), they found that the longer the subtitles were shown on the screen, the longer viewers, in this case children, would look at the subtitle area. Another relevant result from the experiment indicates that poorer readers spend only around 30% of the time looking at the subtitles (much less than other participants) when the subtitles created according to the six-second rule. Probably, the researchers argue, viewers were discouraged and decided not to put much effort into trying to follow the subtitles. On the other hand, the same group spent more time reading the subtitles with the 10-second duration, which indicates they are able to adapt to the duration of the subtitles.

The above studies approached subtitle reading from a global point of view and centered mostly on attention allocation. However, d'Ydewalle and Bruycker (2007) report on the detailed behavior of participants when reading standard and reversed subtitles (i.e. foreign language subtitles and native language soundtrack). They analyze the reactions of children and adult participants who watched excerpts of a movie with

standard and reversed subtitles. Additionally, they added the number of lines in the subtitles as a variable in the experiment. The participants skipped fewer subtitles in the standard (interlingual) subtitle condition, which also means they had slightly more fixations and spent a longer amount of time in the subtitle area under this condition. Under the standard subtitling condition, the participants also had a more regular reading behavior when watching two-line subtitles. With standard subtitling, the mean fixation duration was 178 ms for adults and 248 ms for children.

3.3.2.2. Asking users to assess subtitles

The studies reported above by the group at Katholieke Universiteit Leuven relied almost exclusively on eye-tracking measurements to test the hypotheses. As mentioned, other methods have also been used in reception studies of translated audiovisual material. Gottlieb (1995) used a protest button to elicit simultaneous responses from viewers. The participants were asked to press the button every time they notice a deviation from subtitle standards. The 123 participants in the experiment were deaf and hard-of-hearing people. Interestingly, Gottlieb (1995) found that participants did not react to faulty subtitles according to professional standards, but judged regular subtitling techniques, such as condensation, as faulty subtitles. Further, the audience reacted only to extreme cases of heavy cutting or distortion of the information. The protest button is an innovative technique and the study demonstrates that professional standards do not necessarily coincide with audience expectations. Nevertheless, asking participants to assess the subtitles while they are watching the audiovisual content affects the ecological validity of the experiment. Apart from dividing their attention between the image and the subtitles, the participants also need to devote attention to the button and be alert to judge the translations, which results in a non-natural viewing experience.

3.3.2.3. The reception of humor and culture-specific items

In another study, Fuentes Luque (2003) uses direct observation to explore the reception of translated humor from English into Spanish. The data collection consisted of three stages: direct observation of the participants' reactions during the screening, a questionnaire, and a brief interview. The study includes 30 participants, ten for each condition: original film in English, dubbed version into Spanish, and subtitled version into Spanish. Although the sample is not very big, as commented by the author, possibly the most problematic aspect is the wide age range of the study: going from 16 to 64-

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years old. This is especially problematic since studies have shown there are differences between age groups in a task like watching TV (d'Ydewalle et al. 1989). Fuentes Luque found that the participants watching both translated versions showed lower positive reception of humor elements when compared with participants who watched the original version in English.

Direct observation of the participants while they are watching the input is another method. Unlike with eye tracking, participants do not have to stay still and can behave more naturally. There are no obtrusiveness problems, unless the researcher is in the participant's range of vision. This approach is, however, not unproblematic: the codification of reactions is highly dependent on the researcher and measuring the participant's reactions implies that participants are supposed to react similarly to each input, which is not necessarily the case.

The study of humor has been popular in audiovisual translation in general, as well as in its reception studies branch. Another cluster of research in reception studies has developed in Forlì, Italy, and is oriented towards the study of humor and culture-specific items. Delia Chiaro, Rachele Antonini, Chiara Bucaria and other colleagues have worked on the reception of audiovisual content translated into Italian. The continuity of the line of research undertaken by this group has allowed them to exploit the resources they have at hand and to create a framework that accommodates and tests different approaches (humor studies, audience reception studies). Further, it has allowed them to provide a solid and rather complete overview of the reception of translated products in Italy.

Chiaro (2004) used questionnaires to collect data on the perception of translated verbally expressed humor dubbed into Italian. Antonini (2005) used an adapted humor-appreciation test to test the reception of verbally expressed humor, visual humor and satire on a sample of 32 participants. The results show participants had problems understanding verbal humor. However, strangely, participants were able to recreate puns that were not present in the subtitles. Antonini suggests this could be an effect of the canned laughter in the products. Bucaria and Chiaro (2007) is an especially interesting case because the researchers surveyed cinema and TV experts, linguists, practitioners in the field of dubbing, and members of the general audience. The researchers argue that the results indicate Italian audiences seem to be becoming more familiar with foreign cultures, but this at the same time generates a higher acceptance of "dubbese" (hybrid language used by dubbing industry) and makes it more difficult for

the audience to differentiate between "what is and is not *real* spoken Italian" (Bucaria and Chiaro 2007:115). At the same time, the results indicate that issues arise when there are gaps in the audiences' encyclopedic knowledge that makes it impossible for them to understand the content.

In another study about dubbese, Antonini (2008) uses an online questionnaire to test the participants' understanding of translated content. This study reports something very interesting: most of the participants' declared understanding differs greatly from their actual understanding of the translated content. In her study, Antonini found that more than 60% of the respondents declared they understood the cultural references in the translation, but in 70% of the cases they did not understand them. This raises concerns about the reliability of self-reported comprehension methods and accentuates the need for triangulation. At the same time, it offers valuable insights into the viewer's thinking. Following on from this, Antonini and Chiaro (2009) studied the Italian audience's perception of dubbese. They found the features of dubbese language are recognized as such by respondents; they are aware of the phenomenon. The dubbese might not be adopted, but it is understood and accepted as an addition to the language. By going a step further, Antonini and Chiaro (2009) shed some light on the social repercussions of translation and point to the rapid effects that translation decisions have on the audience.

Chiaro (2007) explores how Italian audiences perceive verbally expressed humor. This time she compares the reaction of 34 Italian viewers and 22 British informants, to analyze how each group responds to original and dubbed or subtitled content. This time again, the sample included a large age group: from 17 to 76-years old. There is a small disparity in the results, with British participants giving higher scores to the verbally expressed humor than the Italian participants. This led the researcher to wonder if humor should be consider culture-specific, coinciding with Fuentes Luque's (2003) results.

Cavaliere (2008) tested the reception of a domestic Neapolitan soap opera subtitled in English. Using questionnaires, she measured the degree of comprehension and enjoyment of the content among Neapolitans, a group of Milanese and a group of Americans living in Naples (only the Americans used the subtitled version). In line with Chiaro's (2007) and Fuentes Luque's (2003) conclusions, the Neapolitans were the ones who were most able to appreciate the culture-specific elements. The absence of a translation of these elements or the standardization of the subtitles negatively affected

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the comprehension and enjoyment of the content. The focus on dialect in this study is particularly interesting since up to now intralingual subtitling has been considered almost restrictively as part of the subtitling for the deaf and hard-of-hearing people or in research aiming at testing the advantages of subtitling for language learning, not at a sociolinguistic level.

3.3.2.4. Eye-tracking and accessibility

Intralingual and interlingual subtitles for the deaf and hard-of-hearing people has also been a prolific area of research. de Linde and Kay (1999) present a series of experiments testing different subtitle features: subtitle rate, onset of speech, shot changes, subtitle editing and visibility of the speaker. Their analysis relies mostly on eye-movement measurements but also on the participants' comprehension of the content. The study included 20 participants, with an equal amount of hearing and deaf people. In all cases the sound of the clips was off, so the participants relied only on the subtitles for the verbal information. While this decision makes good sense to compare the hearing participants' under the conditions of the deaf participants, it affects the comparison of these results with results testing hearing participants with access to the soundtrack. Similarly to d'Ydewalle and Gielen (1992), they discovered that subtitle pace affects reading speed: the faster the subtitles, the faster people read them. They also discovered that slow subtitles induce re-reading, proving that both extremes, slow or fast subtitles, have direct effects on viewers' behavior. Further, shot changes caused more deflections (eye movements when the viewer first looks at the subtitle, then focuses on the image to lastly return to the subtitle area again) and the position of subtitles affects viewers' reading behavior, as does the visibility of the speaker on the screen. Deaf viewers seemed to rely more on the image as a source of information, which hints at a different type of engagement between the image and the viewer depending on the latter's hearing condition.

A series of studies about subtitling for the deaf and hard-of-hearing people has developed in the United States. Jensema (1998) found that the comfortable subtitle speed reported in a group of 578 people including deaf, hard-of-hearing and hearing viewers was 145 words per minute, but the participants adapted well to increased speed until they reach a 171-word per minute speed rate. Jensema et al. (2000b) found the addition of subtitles to the screen drastically changed the behavior of the six participants in the study and turned the viewing process into a reading activity. When watching

subtitled content, subtitle reading manifests as the primary activity, and viewing the action on the screen becomes secondary. Jensema also found that a higher subtitle speed makes the viewers spend more time on the subtitle area. In a larger study, Jensema et al. (2000a) collected eye-movement data from 23 participants who were watching subtitled television programs. The results indicate the participants spent 84% of the time looking at the subtitles, with little variation (82%-86%) when the subtitle speed changed from 100 words per minute to 180 words per minute. Additionally, the researchers found no influence of age and sex, contrary to other research (d'Ydewalle et al. 1987; Bruycker and d'Ydewalle 2003). The education level of participants seemed to be a relevant variable, but the collected data was not enough to interpret these results in practical terms.

Szarkowska et al. (2013) report on a series of experiments conducted to test subtitling for the deaf and hard-of-hearing and audiodescription. In one of the studies, they tested three different types of subtitles: edited (simplified and reduced) subtitles, standard subtitles and verbatim subtitles. The 40 participants in the study were deaf, hard-of-hearing and hearing people. The results indicate the best condition was the edited version of the subtitles, which allowed the participants to look more at the image. When it comes to comprehension scores, the verbatim version produced the best results. However, it was also in this version that the participants fixated on the subtitles the most. In general, the authors point at contradictory results: in many cases the participants' preferred translation mode was not the one that produced the best comprehension scores. The inconclusive results of this experiment motivated the authors to carry out another study. The second study is still unpublished, but the description included in Szarkowska et al. (2013) indicates they have collected data from over 130 participants. The experiment includes two different subtitle speeds and five types of audiovisual programs.

A subsample from the larger study commented on in Szarkowska et al. (2013) is reported in Krejtz et al. (2013). In this paper, the authors focus on the effects of shot changes on eye movements in subtitling. The results include the recordings of 71 participants (including deaf, hard-of-hearing and hearing people) who watched clips from two genres: documentaries and news programs. The results indicate that shot changes do not seem to prompt subtitle re-reading when they occur, but they do seem to alter the viewer's behavior by triggering more gaze shits from the subtitles to the image. This coincides with the effect of deflections detected by de Linde and Kay (1999).

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When going to the subtitle, the viewer's gaze does not go to the beginning of the subtitle in order to reread the whole text but is often directed to the middle of the screen. In Szarkowska et al. (2013), deaf participants had more fixations on the subtitle area than did hearing participants. In this second study, the participants with hearing impairment had a longer first fixation duration and also spent more time on the subtitle area and made more fixations. This supports the idea that people with hearing impairment are slower readers.

3.3.2.5. Comparing the reception of subtitling and dubbing

Another interesting avenue that has opened up for empirical reception studies is the traditional debate between dubbing and subtitling: which is better for the viewer? In a study that used questionnaires to test the viewers' immersion and enjoyment, Wissmath et al. (2009) found that although the subtitles in a foreign language decrease the feelings of spatial presence and transportation, the differences between the scores obtained with the dubbing and subtitling conditions did not reach significance. Additionally, the translation modality did not affect the viewer's enjoyment. Wissmath et al. (2009) argue that these results could be due to the Swiss audience's regular use of subtitling and dubbing.

Bairstow and Lavaur (2012) also report on a study comparing dubbing and subtitling. In total, four conditions are included in their study: original version in English, dubbed version in French, original version with French subtitles, and a reversed condition (dubbed version with English subtitles). When it comes to the comprehension of the dialogues, the dubbed versions score highest, while the version with French subtitles produces comprehension that is almost as good as the subtitled version. The original version scored the lowest results, due to the participants' low level of English.

In a study carried out by Perego et al. (2014) comparing dubbing and subtitling, the findings seem to concord with Wissmath et al. (2009): subtitling does not affect the viewers' enjoyment and appreciation of the film when compared to dubbing. However, subtitling proved better when it comes to support "the lexical aspects of performance". The study was carried out in Italy, a traditional dubbing country, which might refute the limitation pointed out by Wissmath et al. (2009) concerning the participants' regular use of subtitling and dubbing.

3.3.2.6. Reception and proficiency in L2

Taylor (2003) reports on an experiment on the reception of subtitles in a non-subtitling country (Italy). He presented two groups of university students, 50 non-English speakers and 50 English speakers, with a cartoon excerpt subtitled in two modalities: a minimum modality (condensed subtitles) and a maximum modality (longer subtitles with more information). In general, both groups of participants preferred the minimum version. Both results from interviews and questionnaires showed that "the disturbance caused by having to concentrate on the maximum titles outweighed the benefits of the extra information" (Taylor 2003:204). When watching the condensed subtitle version, the participants were able to access meaning through other semiotic modalities, but this was not the case with the extended version of the subtitles.

Some reception studies have already tackled the issue of incidental learning of foreign language with subtitled content (d'Ydewalle and Pavakanun 1995; d'Ydewalle and Van de Poel 1999; Van de Poel and d'Ydewalle 2001; Bisson et al. 2014). These studies fall beyond the scope of this research, since language learning or assessment is not among the main variables of the study. The focus of this study is on testing how people at different levels of proficiency in L2 use subtitles. This has been precisely the topic tackled by a series of studies conducted by Lavaur and Bairstow in France (Lavaur and Nava 2008; Lavaur and Bairstow 2011; Bairstow 2011; Bairstow and Lavaur 2012).

Based on the findings of Lavaur and Nava (2008) that indicate that subtitles could have a negative effect when they are not necessary for the viewers, Lavaur and Bairstow carried out two studies using questionnaires to test to what extent knowledge of L2 makes subtitles redundant. Bairstow (2011) reports on an experiment with monolingual and bilingual participants watching a clip in its original version with English soundtrack or with French subtitles. The results suggest subtitles have a facilitating effect for monolinguals but constitute a distracting element for bilinguals. Noticeably, it seems the subtitled version helped monolinguals to understand visual information, and not only to access the linguistic information. This coincides with Taylor's findings for participants who watched condensed subtitles and were able to better complement their viewing experience with information from other semiotic channels at the same time (Taylor 2003). Bairstow and Lavaur (2012) argue this could be because the monolinguals in the groups were perhaps not totally *monolinguals*, which means their engagement with the subtitles was different due to their reduced but existing knowledge of the source language.

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This motivated a more careful follow-up experiment. Lavaur and Bairstow (2011) again tested the two conditions (original version and interlingual subtitled version, in French) and added an intralingual subtitled version (in English). This time the participants were high-school students arranged into three groups depending on their proficiency in English: beginners, intermediate and advanced. Their results reinforce the two roles of subtitles, which act as a distraction from the visual information but help viewers with low level of language proficiency to recover the linguistic information. The three groups of participants had very different behaviors. The beginners' visual attention dropped with the presence of English subtitles and even more with the French subtitles. However, the effects of the subtitles, or the lack of them, were completely the opposite for dialogue comprehension. Intermediate participants processed dialogue information better than visual information in all three conditions, while advanced participants obtained best results with the original version.

There are some concerns that could be raised in terms of ecological validity within what is normally expected in Translation Studies. On the one hand, the participants in the studies were asked directly to watch the film attentively. On the other, it seems the subtitles were prepared specifically for the experiment: "we proceeded to adapt the subtitles to make them as compatible as possible with the spoken dialogues (while following the recommendations set forth by Carroll and Ivarsson (1998) regarding oral and written language modes)" (Bairstow and Lavaur 2012:276), and they could thus differ from professional subtitles.

In a reception study carried out in Finland, Tuominen (2012) used focus groups to discuss the reception of subtitling. She included three groups: one of near-experts, participants who were majoring in English or translation, and two of non-experts. Tuominen (2012) found that the near-expert group actually relied heavily on the subtitles and was able to recall them during the discussion stage. This shows that the participants with the strongest abilities in the source language in her study also decided, probably consciously, to follow the translation. Regardless of the variation in the level of proficiency in English of the participants, they were able to watch the film comfortably and enjoyed it. The subtitles did not play a distracting role, as reported by Bairstow (2011). Tuominen explains that this can be due to the fact that Finnish people are more used to subtitling, unlike the regular situation in France.

3.3.2.7. Eye-tracking, audiovisual translation and triangulation

Some of the above studies have applied eye-tracking methods to assess the reception of translated audiovisual products from a psycholinguistic or accessibility focus. In this section I present only eye-tracking studies carried out within Translation Studies that test some of the assumed rules or the characteristic features of mainstream subtitling.

In an study measuring performance and analyzing eye movements, Perego et al. (2010) assessed the viewers' reactions to different types of subtitle segmentation. In total, 41 university students were included in the study, but eye-tracking data was collected from 16 of them only. The subtitles for an excerpt of a Hungarian film were created specifically for the study. The control condition included subtitles that followed professional standards, while in the treatment condition, the subtitle segmentation was contrary to those standards. The analysis of the eye-tracking data subset indicates that the participants spent an average of 67% of the time looking at the subtitle area. The subtitle area had a higher number of fixations, while the fixations on the image were fewer but longer. In general, for both conditions, the participants performed well in the recognition of subtitles and scenes, which indicates that subtitles are cognitively effective. Subtitled segmentation was not found to have an effect on cognitive processes, since scores were similar among participants in both conditions.

In a pilot study with four participants, Secară (2011) discusses the use of *txt lingo* (the creative spelling used in chats, SMS and electronic communication) in subtitling for specific environments such as short online videos. The participants reported no problems reading the subtitles and relating to the viewing experience. Being shorter, the subtitles using *txt lingo* allowed viewers to spend more time on the image, according to the eye-tracking data. However, the small sample size requires that these findings be treated with caution. Secară notes that this type of subtitling might be suitable for a certain age group and a specific type of video.

Ghia (2012) compares the reception of subtitles created in accordance with two translation strategies: literal and non-literal subtitles. The study included thirteen university students with an intermediate level of English. The subtitles in both conditions were in Italian and the soundtrack was in English. Gaze data indicate that non-literal translation caused more deflections on the participants. The higher number of deflections occurred when reduction was applied to the subtitles. This indicates that intermediate viewers' behavior can be affected by different translation strategies and

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this might also imply the participants were following and comparing the dialogue in L1 with the subtitles in L2.

Another study exploring specific characteristics of subtitling is presented in Moran (2012). The study includes two features: word frequency and cohesion. Intuitively, the findings of the study indicate that the presence of high-frequency words in the subtitles facilitates subtitle reading behavior. The group of participants who watched the subtitles with the high-frequency words had "significantly lower fixation durations associated with reading the subtitle, spent significantly more time viewing the image and scored better in the post-experiment questionnaire" (2012:215). The subtitles in the high-cohesion condition also prompted better results and allowed the participants to spend more time on the image, which might be considered another argument against reduction in subtitling. Both high-frequency and high-cohesion subtitles contained more characters than their alternative conditions. Moran suggests that instead of focusing on character count, subtitling should be looking more at reading facilitation.

Exploring a different application of subtitles, Kruger et al. (2013) assessed the benefits of using intralingual subtitles for educational purposes. Their purpose was to test the cognitive load of students when they were watching academic lectures with and without intralingual subtitles. Adopting a highly innovative approach, the authors used a wide range of data collection methods in their study: eye tracking (pupil dilation), EEG, self-reported ratings and performance measures. The study shows that subtitles proved to be beneficial in these circumstances: they help students by facilitating the processing and comprehension of the lecture. Further, the students who watched the subtitled version had a lower cognitive load than those who watched the non-subtitled version. Kruger (2014) found that subtitles are not only cognitively effective, but also have a positive impact on immersion and enjoyment. The study included 88 university students with different mother tongues (English, Chinese, Japanese and Korean) who watched an excerpt with or without intralingual subtitles.

One of the conclusions of Bucaria and Chiaro (2007) was that there are sociocultural gaps in the encyclopedic knowledge of viewers, and these gaps obscure comprehension. This made them wonder about the possibility "for screen translation to be integrated with extra information to make up for possible gaps in the sociocultural context" (Bucaria and Chiaro 2007:115). At least three independent studies on subtitling have explored the possibility of including additional text on the screen to provide more

information to viewers (Caffrey 2009; Künzli and Ehrensberger-Dow 2011; Ramos Pinto 2013).

Caffrey (2009) studies the cognitive effort of participants who watch anime subtitled in English, both with and without additional pop-up glosses, using eye-tracking and questionnaires. The pop-up glosses in the experiment are occasionally used to explain culturally marked elements in the anime. The results suggest that increased processing effort is required when a pop-up gloss is on screen, which results in less processing time allocated to the subtitle and a greater number of skipped subtitles. The study found that participants had a better understanding of culturally marked items when they watched the videos with pop-up glosses. Nevertheless, the presence of pop-up glosses on the screen gave the participants in the treatment condition the impression that the subtitles were too fast. In line with other studies (d'Ydewalle and Gielen 1992; de Linde and Kay 1999), Caffrey found that when there was more information on the screen (subtitles plus glosses), the participants read the subtitles faster.

Künzli and Ehrensberger-Dow (2011) study the audience's response to standard subtitles and standard subtitles combined with surtitles, subtitles that appear at the top of the screen and offer metalinguistic information, explaining specific cultural references in the segments. Their method also combines the use of eye tracking and questionnaires in order to collect data on the participants' cognitive effort and performance. They conclude that the material using surtitles produces a higher cognitive load, but "participants' performance in terms of retention of various verbal and visual elements in the movie excerpts was identical in the two conditions" (2011:197). Additionally, since the participants' reception capacity was not affected,2011; Künzli and Ehrensberger-Dow (2011) argue that viewers are able to process a larger amount of information than previously conceived without compromising their comprehension or enjoyment. The authors point out that using surtitles for an entire film could yield different results, such as fatigue and/or reduced reception capacity. Künzli and Ehrensberger-Dow also stress that the acceptance of innovative subtitling might be related to the age and literacy level of the users. However, in an experiment also using surtitles in Portuguese to explain cultural items in a Finnish film subtitled into Portuguese, Ramos Pinto (2013) found some of the viewers consciously decided whether or not to follow the surtitles and thus achieved greater surtitle processing efficiency.

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The combination of eye-tracking data with data obtained from other collection methods is becoming more and more popular in audiovisual translation reception studies. Eye tracking can provide accurate gaze data information, but says little about the repercussions of the viewer's behavior. Interviews and questionnaires provide abundant self-reported information, however they lack the cognitive dimension of information offered by gaze data. Following the combination of methods used by, Caffrey (2009), Künzli and Ehrensberger-Dow (2011) and Ramos Pinto (2013), I rely on eye-tracking measures and questionnaires plus interviews as the methods to collect the data required to answer my research questions.

Chapter 4. Methods

In this chapter I present the methodological framework of my study. First I introduce the research questions and hypotheses that guided my research, then I offer a description of the design of the study and the methods used to collect and analyze the data. In Section 4.1 I revisit the aims of the study in order to define the methodological framework, which also includes the research questions and hypotheses, as well as the operationalization of the main variables. Section 4.2 describes the instruments I used to carry out both the pilot study and the main experiment. The process of data collection and preparation for the analysis is also explained in detail here. Section 4.3 is dedicated to the description of the participants and the sampling procedure, while the subsequent Section 4.4 introduces the materials I used. I address the ethical considerations of the study in Section 4.5. A description of the data-collection procedure is introduced in Section 4.6, followed by Section 4.7, which presents the pilot study carried out in order to ascertain the suitability of the proposed methodology. I describe the conditions for the main experiment in Section 4.8, detailing the modifications made to the research design based on the issues identified in the pilot study. Finally, in section 4.9 I first present a brief description of mixed-effects modelling to illustrate how the statistical models function and how I proceed in the data analysis of the data collected in the main experiment.

4.1. Methodological framework

This thesis presents the results of an experiment that uses eye-tracking, questionnaires, and interviews to collect data on participants' reception of subtitled audiovisual material when they engage with professional and non-professional subtitling. The Spanish-speaking participants included in the study were grouped according to their listening-comprehension skills in English. I assume that different levels of proficiency in English as L2/L3 will generate a difference in behavior in the ways participants engage with the material and the manifested level of reliance on the subtitles. The fixation data from the eye tracker is complemented with information from questionnaires and interviews regarding the participants' audiovisual habits, their performance in content-recall testing and their attitude towards subtitling and other audiovisual translation modalities.

4.1.1. Aims of the study

The objective of this study is twofold. First, I want to explore the *reception* of professional and non-professional subtitling. I want to know if the audience's reception of the subtitled audiovisual material is somehow influenced by the type of subtitles used with the material. Second, I test whether the users' *level of proficiency* in the original language of the product affects the reception of the content. In order to grasp the viewing habits and processes of new audiences, I analyze the ways in which users with different levels of proficiency in the source language engage with audiovisual material subtitled by professionals and non-professionals.

4.1.2. Research questions and initial hypotheses

In this research I explore how the audience engages with professional and non-professional subtitles and what their attitude towards this latter instance of volunteer translation is. In order to do that, I analyze how the audiences' language proficiency in the source language of the product correlates with different types of engagement with the audiovisual content. The main research questions are thus:

- *Does audience reception indicate any difference between the professional and the non-professional subtitles?*
- *Do better reception scores correlate with professional subtitles?*
- *Does the users' level of proficiency in L2/L3 affect the reception of professionally and non-professionally subtitled audiovisual material?*
- *Do participants notice any difference between professional and non-professional subtitles?*

Previous researchers who have compared professional and non-professional subtitles coincide in that the quality of non-professional subtitles is held to be lower than the real or expected quality of professional products (La Forgia and Tonin 2009; Bogucki 2009; Sajna 2013) as presented in Section 3.1) and that non-professionally produced subtitles "would probably not be considered acceptable in a professional context" (Wilcock 2013:108).

To test these judgments and considerations, the main initial hypotheses for this study are as follows:

- H_1: Participants' comprehension scores will be higher with professional rather than non-professional subtitles.

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- H$_2$: Participants with a high level of proficiency in L2/L3 will be less dependent on subtitles than will participants with a low level of L2/L3.

- H$_3$: Participants' reception scores will be higher with the non-professional subtitles produced in Spain (their own country) than with the non-professional subtitles produced in Latin America.

4.1.3. Operationalization

The operationalization of a variable consists in reducing it to "abstract terms in such a way that it really can be tested in practice" (Williams and Chesterman 2002:80). In order to carry out this research, there are two key concepts that should be clearly understood and defined: non-professional subtitling and reception. *Non-professional translation* is defined in opposition to *professional translation* and is positioned in the community translation spectrum. I subscribe to the opposition *professional / non-professional* because I believe it is the one that best describes the current state of affairs: professional translators identify themselves as such as opposed to unpaid outsiders who do translations. This offers me the possibility of relying on monetary reward as the characteristic to differentiate between the two groups. It is true that, as O'Hagan (2011:13) and others have pointed out, "participants in community translation settings are not all untrained volunteers; professional translators also respond to a particular call which they consider worthwhile, despite a lack of remuneration." Nevertheless, the resulting product of their activities should still be considered a non-professional translation due to the conditions in which the professional translators were operating at the moment of the creation of the product.

Reception is the other key concept that should be operationalized. Using Gambier's model (2006; 2009), which distinguishes between three types of reception (the *three Rs*), the different types of *reception* are operationalized in this study as follows:

- *Reactions* at the cognitive level were gathered by collecting gaze data that were used as indicators of attention allocation.

- *Responses* were elicited in terms of the verbal, iconic and narrative attention of the participants as well as their general understanding of the audiovisual content and their subjective judgment of difficulty and enjoyment of the videos. Response data were collected using recall testing and questionnaires.

- *Repercussions* were measured in terms of the users' audiovisual consumption habits and their attitude towards subtitled material; a combination of questionnaire data and interviews helped assess the repercussions.

The variables for this study are operationalized as follows.

4.1.3.1. Level of L2/L3

The level of L2/L3 English is considered an independent variable in this study. I use the label L2/L3 when referring to the position English occupies as a foreign language from the participants' perspective, since most of the participants are bilinguals who speak Catalan and Spanish at L1 level. I tested the prospective participants' listening comprehension in English prior to the experiment in order to decide who could take part in the experiment. The study proposes a comparison between the two extremes of a continuum: thus only participants with a *high* or a *low* level of proficiency in English were considered suitable. As will be explained in Section 4.2.2.1, I used a purposefully designed listening-comprehension test to divide the participants into three groups (high, middle and low listening-comprehension proficiency in English) and excluded participants from the middle group.

4.1.3.2. Type of subtitle

The study compares one professional version of the subtitles with two non-professional versions. It should be noted that all three types of subtitles in the experiment were presented as they were produced, with no alteration, revision or modification performed at any linguistic or technical level. Considering the variation in types of non-professional subtitles, I thought it would be more interesting and ecologically valid to have more than one point of comparison. I included a set of subtitles produced by a non-professional community based in Argentina (NP1) and another community based in Spain (NP2).

4.1.3.3. Attention allocation

Attention allocation refers to the allocation of cognitive resources to the different areas on the screen, namely the image and the subtitles. It is an indicator of the participants' distribution of attention. Following Künzli and Ehrensberger-Dow (2011), two relative measurements are used for this variable: the fixation duration and the number of fixations.

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Total fixation duration on the subtitle area. The total fixation duration on a given area is the result of adding up all the fixations that were recorded within that area. This reports the time that participants spent on the subtitle area while watching the clip. For instance, the sum of the durations of all 401 fixations on the subtitle area for a participant in the study resulted in a total duration of fixations on the subtitle area of 75288 milliseconds (ms). Since there are three clips and different subtitled versions of each clip, it is expected that the *Clip* variable will have a significant effect on the *Percentage of duration of fixations* variable.

Percentage of fixations. In the case of the number of fixations, attention allocation was calculated as the percent ratio between the total number of fixations on an area of interest and the total number of fixations in the recording. For example, if a participant had 350 fixations on the image area and 401 fixations on the subtitle area, then they would have allocated 53% of the attention to the subtitles and 47% of the attention to the image. By calculating attention allocation in percentages, the differences in the number of subtitles and the duration of the videos do not interfere directly with the measurement.

Percentage of duration of fixations. The duration of the fixations is calculated in milliseconds. Attention allocation in terms of fixation duration is calculated as the percent ratio between the total time spent on a given area of interest and the total gaze time recorded by the eye tracker. For instance, if the total fixation duration on the subtitle area for a participant is 75288 ms and the total fixation duration on the image area for the same participant is 119693 ms, then they would have allocated 39% of their attention to the subtitle area and 61% of their attention to the image area.

4.1.3.4. Attention shift ratio

Attention shifts are the constant changes of focus from the image to the subtitles and vice versa. They are used as an indicator of the participants' response to the processing of the content. As a way to standardize the number of attention shifts, I calculated this value as the ratio between the number of shifts and the total number of subtitles in the clip. Attention shifts are related to what de Linde and Kay (1999) call *deflections*, although they refer only to "the number of times a viewer's eyes deflected away from the subtitle area to focus on the image" (de Linde and Kay 1999:61). Another label used for attention shifts is *back-and-forth shifts* (d'Ydewalle and Bruycker 2007), which includes shifts in both directions.

4.1.3.5. Skipped subtitles

The number of unread subtitles was used to calculate the degree to which participants relied on the subtitles as a source of information. The percentage of *skipped subtitles* per clip was calculated by counting the number of unfixated subtitles (subtitles without a single fixation) and dividing this figure by the total number of subtitles in the clip.

4.1.3.6. Mean fixation duration

The mean fixation duration is computed for each of the two areas of interest: the subtitle area and the image area. The value is obtained by adding up the *duration* of all fixations on the area and dividing the result by the *number* of fixations on the area. For instance, drawing on the figures in the previous example, the mean fixation duration for the subtitle area in the case of this participant would be obtained by dividing 75288 ms by 401 fixations, which would result in a mean fixation duration of 187.75 ms on the subtitle area.

4.1.3.7. Reception capacity

Reception capacity is measured by a content comprehension test. The number of correct answers in the test served to assess the performance of the participants. This is calculated from a set of free and cued-recall questions asking about three sources of information in the video: *verbal*, *iconic* and *narrative* information (Künzli and Ehrensberger-Dow 2011) plus a gist comprehension question.

4.1.3.8. Self-reported comprehension

Participants were asked to rate their comprehension of the videos, ranging from 0=*no comprehension* to 5=*very good*, right after they had finished watching each clip. A 6-point Likert scale was used in accordance with Caffrey's (2009) argument, which favors a Likert scale with an even number of items. Since the scale does not include a neutral position, it allows to force a choice-decision on the respondents (Trochim 2006) to determine if they lean more towards declaring they understood the content (values between 3 and 5) or towards declaring they did not understand it (values between 0 and 2). In the end, this division was not necessary for the mixed-effects models.

4.1.3.9. Audience enjoyment

The exploration of the audience's enjoyment relied on the subjective judgment of the participants. They were asked to report their degree of enjoyment of the content. The

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questionnaire included a scaled item to collect their opinions on each video segment. The video clips were taken from a comedy TV series. Considering that the goal of a comedy is to entertain the audience, a 4-point scale from 1=*boring* to 4=*great fun* was used to measure audience enjoyment.

4.1.3.10. Subtitle-reading effort

The perceived complexity of the subtitles was measured in terms of the participants' self-reported difficulty to follow them. A 6-point Likert scale ranging from 0=*very difficult* to 5=*very easy* was used to determine the ease with which participants read the subtitles. In the phrasing of the question, however, I used the term *translation* instead of *subtitling* in order to prevent the participants from focusing excessively on the subtitles.

4.1.4. Sub-hypotheses

In my main experiment, a group of 52 participants with two levels of proficiency in English (high and low) watched three clips with three different types of subtitles (one professional version, one non-professional version produced in Spain and one non-professional version produced in Latin America). Data on their reception were gathered using gaze-fixation data, a questionnaire and interviews.

Given this research design, a set of sub-hypotheses stemming from the set of initial hypotheses were postulated to aim at more specific goals and results. In these sub-hypotheses I have tried to abide by the orthodox perspective as far as possible in order to design the route map for the study and, when possible, I have included the specific nature of the relation between the variables involved:

- H_1: Type of subtitle:
    - $H_{1.1}$: *Reception capacity* is higher with *professional subtitles.*
    - $H_{1.2}$: *Subtitle-reading effort* is lower with *professional subtitles.*
    - $H_{1.3}$: *Self-reported comprehension* is greater with *professional subtitles.*

Additionally, an explanation for the higher comprehension scores could be supported with eye-tracking measurements. Assuming professional subtitles are created following professional standards that are deemed appropriate to less demanding reading habits, I propose the following set of hypotheses:

- $H_{1.4}$: With professional *subtitles*, more *attention is allocated* to the image area.

- $H_{1.5}$: *Mean fixation duration* is shorter with *professional subtitles*.

- $H_{1.6}$: Fewer *subtitles are skipped* when participants are watching *professional subtitles.*

- $H_{1.7}$: *Attention shift* varies depending on *type of subtitle.*

- H_2: Level of L2/L3:

    - $H_{2.8}$: Participants with a high *level of L2/L3* allocate less *attention to the subtitle area.*

    - $H_{2.9}$: *Mean fixation duration* varies depending on the *level of L2/L3.*

    - $H_{2.10}$: *Audience enjoyment* is higher for participants with a high *level of proficiency in L2/L3.*

- H_3: Type of non-professional subtitles:

    - $H_{3.11}$: *Reception capacity* is higher with *NP2.*

    - $H_{3.12}$: *Subtitle-reading effort* is lower with *NP2.*

    - $H_{3.13}$: *Self-reported comprehension* is greater for *NP2.*

Two additional hypotheses are postulated, to be answered based on the qualitative analysis of the interviews:

- H_{14}: Participants will be more positively inclined towards the *professional* rather than non-professional subtitles.

- H_{15}: Participants will be more positively inclined towards the *Iberian* rather than *Latin-American* subtitles.

4.2.   Instruments

4.2.1. Mixed-methods approach

The multimodal nature of audiovisual material and the complexity of the reception process mean that *multiple* research methods are necessary if one is to approach a robust understanding of the problem tackled in this thesis. This normally involves a mixed-methods approach. By studying the events through the data provided by different tools, mixed methods allow us to find common aspects and contradictions in the data, thus

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producing a rich and interesting interpretation of the phenomenon under study. When using eye-tracking methods to gather information, it is recommended to combine them with other types of data to increase the validity and reliability of the results. As Soluch and Tarnowski (2013:91) put it, "it is said that analyses of findings concerning eye movements as a response to a stimulus situation are inaccurate because one does not take into account the complexity of human reactions, associations and classification of the perceived objects". While this is true, the data provide us with the tools to put our hypotheses to test.

Mixed-methods research is presented by Johnson et al. (2007) as a type of research that in itself "combines elements of qualitative and quantitative research approaches […] for the broad purposes of breadth and depth of understanding and corroboration" (2007:124). The mixing stage, the specific moment when the quantitative and qualitative approaches are combined, can occur at any moment during the research development (at the design stage, data collection stage, the data examination stage or the interpretation stage), but both approaches should be involved in the interpretation of the data. Implementing both quantitative and qualitative approaches provides the necessary tools to offer a more comprehensive view of a complex phenomenon that is approached for the first time (Johnson et al. 2007).

An approach closely associated with mixed-methods research is pragmatism because the approach ultimately aims at finding the best answers to the research questions. By assuming a pragmatic approach, the researcher has the possibility of giving primary importance to the *goals* of the research rather than to the methods used. There is no prior methodological or theoretical commitment, but rather an orientation towards using the methods that better suit the purpose. A mixed-methods approach orientates one towards "what works" best for the questions asked when deciding on the methods to apply for the study (Creswell and Plano Clark 2011:60). Within the mixed-methods research paradigm (Johnson et al. 2007), the qualitative approach allows the researcher to become acquainted with the experiences and behavior of the participants.

In this study, a qualitative approach was used to collect information on the participants' perception and enjoyment of the content. It was important to know what participants made out of the material they were watching in the experiment and if they enjoyed what they were watching. Further, by asking the participants about their habits and behavior, it was possible to contextualize the information collected through

quantitative methods. The quantitative approach, on the other hand, provided me with measurable data that can be analyzed statistically, which reinforces the external validity of the results and enables between-group comparison. By applying both quantitative and qualitative methods in a mixed-method research design, the study seeks to report the subjective experiences of the users. The common points as well as the contradictions found in the different types of data allow for a richer understanding of the users' reception of the audiovisual content.

In the search for a more nuanced understanding of findings, triangulation has become important in Translation Studies (O'Brien 2010; Saldanha and O'Brien 2013). Triangulation is in line with mixed methods since it implies the combination of different data collection methods in a project in order to make both the comparison and contrast of the results possible. Apart from verifying the reliability of the findings, triangulation can also help identify the cases in which results seem contradictory and might merit an analysis of a different type. While the validation of results is a good motivation for using triangulation, the selection of methods should also take into account the scope of the research and the possibilities of the researchers involved. Collection methods can produce large amounts of data that will need careful processing to provide reliable resources. There is always a tradeoff between the aim of the study, the data collection approach and the feasibility of the project.

The data collection process for my experiment consists of three stages, corresponding to three data collection methods:

1. Initial survey: This stage includes two questionnaires: an initial questionnaire aimed at collecting data on the participants' audiovisual habits and language knowledge, as well as a listening-comprehension test to categorize the participants according to their listening-comprehension skills.

2. Eye-tracking sessions: This part of the experiment served to collect gaze-fixation data and data reporting on the participant's performance on recall tests, as well as subjective opinions about the materials.

3. Interviews: The interview session aimed at gaining more insight into the participants' audiovisual habits and their opinions about professional and non-professional subtitling.

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4.2.2. Questionnaires

The experiment required two different sets of questionnaires: the pre-experiment questionnaires, to gain some knowledge about the population and screen the prospective participants, and the experiment questionnaires, which included the content recall testing and subjective ratings.

4.2.2.1. Pre-experiment questionnaires

This stage involved a pre-experiment questionnaire on the participants' background, media-consumption habits and linguistic skills, followed by a listening-comprehension test to select the participants for the next part of the study. This initial stage had a twofold purpose: to acquire some knowledge about the university students' audiovisual consumption habits, and to screen the population in order to select the participants for the second stage of the project. The data collected with this questionnaire concern Gambier's third *R*: the *repercussions* of the products at the attitudinal and social levels.

Both the questionnaire and the test were designed to be administered on paper and in an environment where I could have direct access to groups of participants, such as in class or in the library at the university. Having direct access to the participants allowed me to control the number of times participants watched the clip that was used to test their listening-comprehension proficiency. Furthermore, it allowed me to inform them verbally about the research, clarify any doubts they had, and in some cases confirm their willingness and availability to participate in the second stage of the study. By administering the questionnaires to a group of students at the same time I could reach a higher number of respondents.

The questionnaire contained nine questions, related to language skills, audiovisual consumption habits and audiovisual translation preferences (see Appendix 3). The anchors for the Likert scale enquiring about the use of audiovisual translation modalities were adapted from Cañadas Osinki and Sánchez Bruno (1998). The guiding idea of this initial questionnaire was to diagnose how the university students engage with audiovisual content and how they use different audiovisual translation modalities.

Since standardized tests are designed to assess a wide *range* of skills, I developed a specific proficiency test to categorize the participants according to their listening-comprehension skills alone. Considering that, from a linguistic point of view, understanding a TV series requires mostly listening skills, I designed a listening-

comprehension test using an excerpt from the TV series used for the experiment. As Thomas (1994: 322) explains, this type of test "has the advantages that if all participants are tested uniformly, proficiency within the sample may at least have internal consistency and that subgroups may be compared with respect to proficiency on some rational basis." Students were asked to watch a 103-second excerpt from the TV series *The Big Bang Theory*, in English and without subtitles (due to the large number of participants expected at this stage and the fact that I was not assessing them in terms of reception capacity, contrary to what I did in the main experiment, I did not control for the participants' previous knowledge of the series). Right after that, they took a multiple-choice test that included seven questions about the events in the video. Each question had four options and a fifth "I don't know" option (see questionnaire in Appendix 4). Based on the number of correct answers, the students were classified into three groups: low (0-2 correct answers), mid (3-4 correct answers) and high (5-7 correct answers). One of the main objectives of the pilot experiment was to validate the appropriateness of this test as a tool to categorize the participants.

I initially chose three different clips that could be used as part of the listening comprehension test. I then discussed the nature of the test with two lecturers with experience in teaching English as a foreign language in the Department of English and German Studies at the Universitat Rovira i Virgili in order to select which one would best suit the requirements of the test. After listening to their opinions and recommendations, I created a set of ten possible listening-comprehension questions for one of the clips. To make sure the questions were in line with what is required in listening-comprehension tests for English learners, I asked the lecturers again to give their opinions and help me select the most appropriate one. The opinions of the experts and their collaboration in the design of the test helped to confirm its agreement with the nature of listening-comprehension tests and the assessment method students are familiar with.

4.2.2.2. Experiment questionnaires

The experiment questionnaire was presented to the participants as part of the on-screen material. Unlike the pre-experiment questionnaire, the questions were displayed one by one on the screen and participants answered them verbally. There was no time limit for answering the questions. Like the subtitles, the questionnaire was written in Spanish. The complete questionnaire is included in Appendix 5. The questionnaire mixes open-

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ended questions and multiple choice questions, as well as Likert scales. Thus, the questionnaire combines free recall and cued testing, which aims at obtaining more reliable results. The questionnaire was divided into four sections: one unique introductory set of questions, and one set of content and enjoyment questions after each clip.

After each clip, the participants answered 16 questions about their comprehension of the content of the clip, in terms of both recall testing and assessment. The first question asked whether they had seen the episode before (to use this information as a control variable in the statistical analysis) and then they were asked to narrate what happened in the video. The next six questions assessed their reception capacity in terms of three different types of information: narrative, verbal and iconic. This typology of information was adopted from Künzli and Ehrensberger-Dow (2011). The participants were offered the answer "I don't know" in the multiple-choice questions; during the description of the experiment I told them they could also use this option for the open-ended questions. Three additional questions asked the participants to assess (on a 6-point Likert scale, as suggested by Caffrey (2009) the content of the dialogue and their degree of enjoyment, as well as the difficulty they had in following the subtitles (although, as mentioned, the phrasing of the question used the term *translation* in order to prevent the participants from focusing excessively on the subtitles). After indicating each of these scores, they were also asked to give reasons for their ratings.

Different versions of the questionnaires were created and modified in the preparation stage. I created about ten content questions for each clip and discussed them with my supervisor as well as with Dr. Sara Ramos Pinto from the University of Leeds. Their feedback and advice contributed to the design of the initial complete version of the questionnaire. That version was then discussed with members of the Intercultural Studies Group and other PhD candidates at the Universitat Rovira i Virgili. I implemented further modifications to the questionnaires and asked two Spanish friends who fit the profile to watch the clips and answer the content questions. This last testing provided me with information related to issues in the phrasing of the questions and gave me an estimate of the time required to complete the test.

4.2.3. Interviews

Interviews have also proved to be useful for reception studies dealing with audiovisual translation (cf. Fuentes Luque 2003; Tuominen 2012; Ramos Pinto 2013). Questionnaires are practical data collection tools because the data produced is concise and can be processed in a fast and structured manner. Nevertheless, questionnaires fall short when it comes to exploring individual differences and discovering aspects that were not initially evident or relevant in the eye of the researcher. Since this study aims at analyzing the reception of subtitled material in a holistic way, it seemed reasonable to gain more insight into the participants' thinking and to provide them with the opportunity to freely voice their opinions regarding their audiovisual consumption and the various audiovisual translation modalities.

Thus I interviewed the participants immediately after the eye-tracking session. The semi-structured interviews included questions related to the participants' audiovisual consumption habits (to obtain information more fine-grained than that provided by the pre-experiment questionnaire), as well as questions regarding the participants' knowledge and assessment of non-professional subtitling. The interviews lasted between 15 and 25 minutes. This duration allowed me to have a natural exchange with them and to acquire more detailed information at the individual level.

After collecting the interview data, it was evident that I would have missed a relevant source of information had I decided to rely on questionnaires only. For instance, some participants told me that they had grown used to using closed captions in the absence of regular subtitling. Although they admit there is a delay and the format could be bothering for them, they say it helps them when the dialogues include unknown words or when characters are speaking too fast. Closed caption was not addressed by my research design, but this information can nevertheless complement the information related to the emergence of new behaviors among viewers.

Another important part of the interviews was the debriefing of the participants with respect to the whole rationale and aim of the study. At the end of the interview, I informed them about the specific purpose of the research and offered to answer any questions they might have. All they knew until then was that the broad purpose of the study was to explore the reception of popular audiovisual products produced in the United States and distributed in Spain. To finish, I showed them parts of the eye-

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tracking recordings and offered the possibility of giving them more information or the data if they were interested.

4.2.4. Eye-tracking data

The type of eye-movement data provided by the eye tracker can be classified into three categories: fixations, saccades and pupil size. In this study, I rely mainly on fixations as the source of attentional and cognitive information for the project. Although pupillometrics has been used in the field of audiovisual translation, I decided against it mainly due to practical reasons. I considered that the number of participants I wanted to include and the conditions for the experiment would make it very difficult to also include pupil dilation as a variable. The pupil is highly sensitive to a broad range of stimulants, so an additional series of elements need to be controlled in order to use this data in the analyses. Further, the processing of data produced by the combination of surveys, interviews and fixations measurements was already a challenging task that would have been multiplied exponentially with the inclusion of pupillometrics.

Eye-tracking studies are based on the eye-mind hypothesis. It is assumed that when the eye fixates on a specific point, the brain is engaged in unobservable cognitive processes related to the fixated area (Just and Carpenter 1980). The general principle guiding the application of eye-tracking methods to audiovisual translation assumes that there is a division of the viewer's attention. The viewer's fixations on the image area indicate processing of the visual input that is shown on the screen. On the other hand, when the fixations are on a different area, such as the subtitle area, this means that the visual attention is focused on the information provided there.

4.2.5. Eye-tracking system

There are different types of eye trackers available on the market nowadays. They vary depending on the type of setup desired and the method they use to record the eye movements. At the Intercultural Studies Group we use a remote video-based eye tracker, Tobii X120. This type of eye tracker is an independent device (unlike the Tobii T series models, which are integrated to a computer monitor) that can be connected to different types of screening devices. Furthermore, the Tobii remote eye tracker does not require the participant's head to remain completely still or to be secured with any additional tool such as a bite bar or a chin rest. Thus, the Tobii X120 helps to create a

more naturalistic environment. Nevertheless, the distance from the participant's head to the eye tracker should be constant and the participant should remember to focus on the screen, thus preventing accuracy problems, excessive drift effect or gaze data loss.

The eye tracker was connected to a laptop that complied with Tobii's recommendations included in their White Paper (Tobii Technology 2010) and the laptop was connected to a 23" LCD monitor that acted as presentation screen. The laptop and the external monitor had a 1920×1080 resolution, which allowed me to activate the Live Viewer function in Tobii Studio and monitor the recording of the session in real time. The eye tracker was placed below the screen, a webcam to record the participant's face was placed on top of the screen and a stand-alone microphone was also placed on the desk. The eye tracker and all the other peripheral devices used were controlled using Tobii Studio.

Figure 1. Layout of the recording area used for the experiment
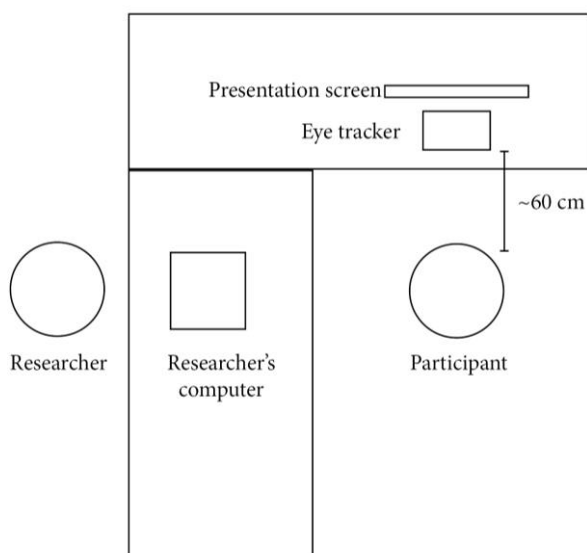
The layout of the recording area can be seen in Figure 1. Although it is not always recommended because it could alter the participant's behavior, I stayed in the room with the participant during the eye-tracking session. The participant was also answering the questionnaires during the session, so it could have been strange for them to be left alone in the room since it might suggest to them that they were being monitored by someone outside their visual field, which was not the case. At a more practical level, at the Universitat Rovira i Virgili we do not have an eye-tracking laboratory where one could leave participants alone with their tasks while the experiment is monitored. This was a concern at the beginning of my project, so I asked

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the volunteers and participants during the pre-pilot and the pilot sessions if my presence created any disturbance. Only one of the participants in the pilot experiment mentioned that the situation was uncomfortable at the beginning but she quickly adapted to it.

4.2.5.1. Apparatus

The experiment took place in the Aula d'Anàlisi de la Parla at the Campus Catalunya of the Universitat Rovira i Virgili in Tarragona. During the experiment sessions, data was collected in the form of voice-recordings and eye-tracking data.

Figure 2. Experiment setting
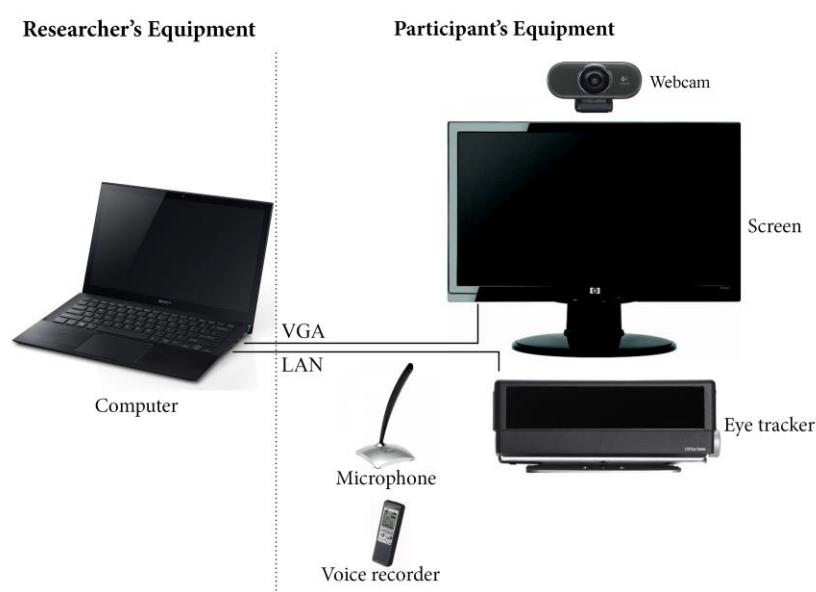
Carrying out all the sessions in the same setting helps to avoid effects that occur when a remote eye tracker needs to be moved, such as variations in the distance of the participants to the monitor and in the distance between the monitor and the eye tracker. Additionally, it makes it easier to control lighting conditions. The participants came to the laboratory individually and I made sure they were seated approximately 60 cm away from the eye tracker. I calibrated the eye tracker for each participant before the experiment: participants focused their gaze on a dot that stopped at nine data points in a 3×3 grid displayed on the screen. Lighting was kept relatively constant by closing the blinds and turning on the same lights for all sessions. All of the participants wore over-ear headphones during the eye-tracking session and the volume was maintained at the same level. The microphone and a recorder were used to record the participants'

answers and the interview. The webcam was used to record the participants' reactions, although this material was not used in the end.

The eye tracker is located below the screen and a camera inside it gathers the reflections on the cornea and calculates the position of the gaze on the screen. When operating at 120Hz, the X120 eye tracker provides fine-grained measurements since it records eye movement every 8.3 milliseconds. At the same time, working with this sample rate, the eye tracker offers an average accuracy of 0.5 degrees, which translates as up to 1 cm of inaccuracy.

4.2.5.2. Input preparation

As explained in Section 4.5, I decided to use six different orders of presentation to allow for a randomized presentation of the subtitles and to avoid introducing bias. Given the design, I needed to have control over the order of presentation of the videos and make sure each order had the required amount of participants. The Tobii Studio software includes an option for randomizing the presentation of the media, but it follows a pre-established method for the randomization feature. After consulting with the distributor Alt64/Tobii in Barcelona, I discovered it was impossible to have this type of control over the sequence of presentation from within Tobii Studio and I had to predefine six different *tests* within the project.

Figure 3. Sequence of presentation for the tests
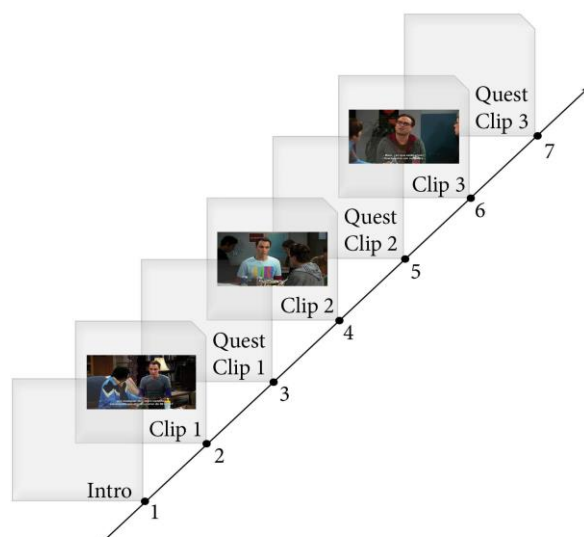
Tobii Studio tests consist of a sequence of media elements structured along a timeline. The distribution and properties assigned to the elements in the timeline define the order, timing and duration of the stimulus presentation. The order in which the

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elements are placed in the timeline coincides with the order in which the participants will watch the stimulus. Figure 3 presents the structure of the tests I used. The tests for this study comprise a sequence of on-screen questions and video clips. As mentioned above, the only variation in the tests was the type of subtitle shown each time; the rest of the questions and their position on the timeline remained the same.

The tests started with three general questions, followed by a synopsis of the TV show and an image introducing the main characters that would appear in the videos (the image was included as a result of the pilot test, as described in Section 4.8). Following the introductory section, the sequence consisted of an alternation of the clips and the questionnaires. There was no time limit for the participants to answer the questions: I told them to indicate when they had finished answering each question so I could be sure and change to the next item in the timeline. At some point during the preparation of the experiment I considered the possibility of letting participants control their own timing and use the keyboard, the mouse or a remote to move along the stimulus presentation, but I considered this might cause other problems, such as participants shifting position during the recording. When creating the tests in Tobii Studio, the element *Movie* was used to add the videos and the element *Instructions* was used for the on-screen questions and instructions for the participants. Videos were imported in AVI format and were prepared to have a 1920×1080 resolution, given that Tobii Studio presents the elements in actual size, without any resizing or a fit-to-the-screen option. The appearance of the subtitles on the screen was not altered in any way.

The professional version of the subtitles was extracted directly from the DVD distributed in Spain by Warner Bros and the non-professional subtitles were embedded in the video using the default appearance settings of FairUse Wizard 3D R2.

Although Tobii Studio allows for a pre-visualization of the stimuli as a quality assurance tool, I considered the tests to be too long and included too many elements for this purpose. In order to avoid any problem going unnoticed, I decided to pilot test it. Since finding the necessary number of students for the experiment was a very difficult task, I could not risk losing data because of the experiment equipment. Taking this into consideration, I tested the entire setup under laboratory conditions with the help of colleagues and friends acting as participants. Before starting the pilot study and once the questionnaires were prepared, I asked two members of the Intercultural Studies Group to come to the laboratory to test the experiment. Considering this was the first time I

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was using an eye tracker, this test proved very valuable because I was able to correct problems in the design of the stimulus and become familiar with the functioning of the apparatus. Once I had altered the experiment based on the comments made by my colleagues and the notes taken during these tests, I invited a friend to come to the lab and run a complete test. These testing sections were carried out before the official pilot study. As pointed out by Holmqvist (2011:114), reiterative pilot studies are common in eye-tracking experiments for many reasons, ranging from technical issues, such as making sure all the devices are properly connected, to more personal reasons, such as reassuring the researcher about the validity of the experiment and also to gain practice in the handling of participants and the equipment.

4.2.5.3. Recording

Before starting the calibration process, I explained the functioning of the eye tracker to the participants and offered them the possibility of asking any question they might have about the experiment or the eye-tracking system. Then I used the Tobii Studio Track Status tool (see Figure 4) to position the participant in front of the eye tracker. The Track Status box displays the participant's eyes as two white dots against a black background. The eye tracker calculates and displays the distance between the device and the participant's eyes. As indicated in Section 4.2.5.1, the eye tracker should stand at about 60 cm from the participant's eyes. In the black live viewer box, the reflection of the eyes of the participant should be centered to allow enough room for possible head movements. The track status box also proved a very useful tool to show the participants how the eye tracker identifies their eyes and the range of movement they could have during the experiment. Since the eye-tracking session with each participant lasted approximately 20 minutes, it was important to inform the participants that they could reposition their head and sit comfortably during the recording.

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Figure 4. Tobii Studio Track Status box
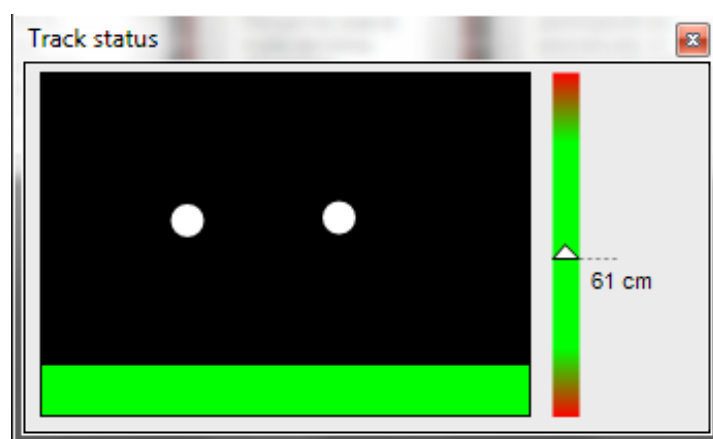
4.2.5.4. Data quality

Once eye-tracking data has been collected and before it is analyzed as part of any study, it is mandatory to run thorough inspection of the quality of the data and determine whether it is safe to include it in the analyses and rely on the findings that will originate from its exploration. Eye-tracking data are sensitive to a wide range of factors and even when all precautions are taken, a certain degree of data loss is expected to occur (O'Brien 2010). Saldanha and O'Brien (2013:139) suggest including 25% more than the minimum number of participants required, just to make up for any data losses resulting from poor-quality recordings. The data-quality process aims at ensuring that a sufficient amount of data is actually available and in good shape to run the analysis and test the hypotheses.

As described above, I took different types of precautions to minimize the effect of the different factors that could affect the data. As part of the quality assurance process, after the data collection stage was completed, I used three methods to evaluate the quality of the data: sample rate, fixation measure and gaze time on screen. Tobii's sample rate is a measurement that is popular in Translation Studies, but due to the design of the stimuli in my experiment I could not rely on it as a quality indication. Using the fixation measure as a data-quality technique proved problematic due to the nature of the data collected and the lack of literature reporting enough details to compare the results. In the end, gaze time on screen proved to be the most reliable and consistent method in my case. The following paragraphs will describe these three methods and a table presenting the results of applying them all to the collected data per participant and clip is presented in Appendix 6.

Sample rate

The sample rate is a rough metric provided by Tobii Studio as an indication of the quality of the eye-tracking data in a recording. Tobii Studio assigns a validity code per eye to each gaze sample it records. When no data are collected at any given moment (i.e. when the eye tracker does not find one or both eyes), this data point is marked as invalid. A 100% sample rate in Tobii Studio means both eyes were correctly identified throughout the recording session, but this is a highly unusual scenario. Accordingly, a 75% sample rate indicates that 25% of the possible data was not recorded: this means one eye was not found for 25% of the time or that the sum of the moments when the eye tracker did not find either of the eyes accounts for 25% of the time.

The benefits of this method are mainly related to the immediacy with which this value is acquired: Tobii Studio calculates the sample rate automatically when the recording is finished, whereas the other methods to assess the quality of a recording require the researcher to export the raw data and process it manually. However, this calculation does not take into account the data loss due to the other experiment conditions. If the design requires (or allows) the participant to look away from the screen at any given point, this will be erroneously considered data loss. In my case, for example, this value was almost irrelevant. As described in Section 4.2.5.1, all of the elements in the tests were shown one after the other and only one session recording file was created per participant. Thus, the recording included not just the gaze data from the videos, but also the data collected during the instructions and the on-screen questions. Use of a gaze rate based on the data from all these elements was not a reliable measurement, especially considering that people tend to look away from the screen when they are thinking or do not know the answer to a question. Since these data were not going to be part of the analysis, I could have deactivated the eye-tracking option provided by Tobii Studio while administering the questionnaires. Nevertheless I was interested in following the participants' attention during the entire experiment in case I could use it as an additional tool to corroborate data loss or problems in the other sections of the recordings. I also wanted to have their faces recorded during the entire experiment in case this data could be used for further analyses. Considering the amount of data I collected and the effort it required, it was interesting to consider other ways to exploit the data in the future.

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Fixation measure

This method relies on mean fixation duration to assess the quality of eye-tracking data. It is common for the researcher to decide on a minimum mean fixation duration threshold and use it to assess the quality of the data. Any recording with a mean fixation duration lower than the threshold is discarded as poor-quality data. Hvelplund (2014) argues that it is possible to use other studies as a standard to define the threshold. He refers to the average fixation means presented by Rayner (1998:373) as a point of reference. These means range from 225 ms for silent reading to 400 ms for typing. The method is popular in Translation Process Research, but it is not unproblematic. As pointed out by Hvelplund (2014), it might be misleading because it does not take into account the potential degrees of incompleteness: it is calculated based on the data that is successfully collected by the eye tracker, even if it is fractioned and regardless of the quality of the data collection itself. That is to say, a mean fixation duration could be deemed appropriate even if calculated with only a minimum fraction of the possible data.

By itself, this already offers a valid argument for not using this method as a fully reliable measurement, but in my case I had an additional problem: defining the thresholds. First of all, to apply this method as a standard for judging the quality of subtitled-material reception, it is necessary to recognize that watching subtitled material involves analyzing the visual animated input and the written text. Mean fixations are highly variable and have proved to be task-dependent: the eye behaves differently, even when looking at the same object, depending on the task. Based on the existing research presented in Section 3.3.2, it is safe to assume that viewers' reading behavior varies and that reading subtitles and watching the video would produce different types of fixations. In a study exploring translation for dubbing, Hvelplund (Forthcoming) found very long fixations during film processing (285 ms) when translators are watching the clip that will be dubbed, whereas the static source text had much sorter fixations (208 ms). Nevertheless, these means are not as long as the mean fixation duration for scene perception (330 ms) reported by Rayner (1998:373). Taking this into consideration, I opted to calculate two different means (one for each area) and then assess the data based on those results, since it seemed more appropriate.

Defining the thresholds for these two areas with the existing literature proved to be an impossible task. Rayner's thresholds are based on the extensive literature in eye-

tracking research. However, research on *subtitling* using eye-tracking is not yet abundant and, even among the published research, it is difficult to find enough information to actually define a grounded and solid standard. For instance, Caffrey (2009:163) reports a mean fixation duration of 237 ms for one-line subtitles and 201.43 ms for two-line subtitles, while d'Ydewalle and Bruycker (2007) found a mean fixation duration of 178 ms for standard subtitles among adults. The mean fixations in these two studies differ greatly and, even more problematic, neither of them includes the value of the mean fixation duration on the image area. Perego et al. (2010:259) included both values. Their mean fixation duration for the subtitle area was 221 ms, while they obtained a mean fixation duration of 422 ms on the image area. Moran (2012) does not test standard subtitles but uses different experimental conditions in her study: the means presented range from 507.30 ms to 877.91 ms for the subtitle area and 966.29 ms to 1298.86 ms for the image area. Secară (2011:166) reports the means of the total fixation time on the image and on the subtitles: a mean total fixation time of 1890.33 ms for the subtitle area and 409.04 ms for the image area. Künzli and Ehrensberger-Dow (2011) use a different format to report the mean fixation found in the mainstream subtitle condition of their experiment (0.36 s), and the difference in format makes it difficult to compare this mean with other mean fixations, although evidently it can be considered a very long mean since it should be somewhere between 360 ms and 369 ms. These are means of the total fixation time per subtitle, so they are not comparable to the mean fixation duration presented in other publications. As exemplified by this wide range, the lack of standardization among the studies in the field makes it very difficult to set a minimum fixation duration to use as a tool to assess eye-tracking data quality.

Before totally ruling out the possibility of using this method, I tried an alternative modified version that would set the thresholds for excluding participants based on the collected data itself. I calculated the mean fixation duration for all the participants for the subtitle area (*M*=187.91 ms, *SD*=37.32) and the image area (*M*=345.45 ms, *SD*=93.92). I then flagged the participants falling outside two standard deviations of the mean. Results showed the means for some of the recordings of the participants P04, P08, P12, P21 and P46 fall outside the two standard deviations of the mean for all the recordings. Before deciding to exclude these participants, I noticed all of them were in the High English Level group and spent less time on the subtitle area than on the image area. Since this could be an indicator of a different behavior and all of them were above

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the mean plus two standard deviations instead of below the mean, I decided to keep them for the analysis.

Gaze time on screen

Calculating the exact percentage of gaze data collected by the eye tracker during the session required post-recording cutting of the data files. This process had to be done manually and independently of Tobii Studio. The raw gaze data are exported to a spreadsheet and then processed using different formulas in an Excel spreadsheet. Since only the gaze data collected for the media elements were pertinent for my research, the gaze time on screen was calculated for the three clips watched by each participant, producing three different and independent scores. To obtain the gaze time on screen, the ratio between the total gaze data duration and the total media element duration is multiplied by 100. The scores then provide a percentage of the amount of data that was captured by the eye tracker in contrast to all the data that could have been captured. Hence, this method avoids the completeness issue resulting from the fixation measures explained above. One of the problems brought up by this method is its inability to account for the occasions when the participants are actually forced or allowed to watch away from the screen. This poses a problem for Translation Process Research, as indicated by Hvelplund (2014), because translators may be allowed to use print dictionaries or notes, causing them to focus on an element other than the screen. However, this does not pose a problem for audiovisual reception studies, since participants are expected to engage with the content and focus on the screen during the recording. It does bring about other issues, such as the participants' responses to the content. In my case, some of the excerpts amused the participants to the point that their laughter caused them to close their eyes. Perhaps this should be taken into account for future audiovisual translation studies involving comedy material and eye tracking.

The decision to include or exclude the participants would again rely on setting a threshold that would flag the participants with low gaze times on screen, indicating low quality data. I first considered using the mean for all the participants and recordings, since it has been done previously (cf. Hvelplund 2011; 2014; Doherty 2012). The mean for my data was very high at 93 %, with a 6% standard deviation. This was a good sign for the quality of the data, but applying such a high value as a threshold would leave out valuable and valid data. Considering that O'Brien (2010:257) notes that thresholds as low as 70% of the total time of the experiment duration have been regarded as valid for

analysis, I decided to adopt an 85% threshold, as used by Caffrey (2009) and applied by Künzli and Ehrensberger-Dow (2011). Resorting to an arbitrary threshold might seem questionable. Nevertheless, an 85% data threshold means, for example, that data are collected from 8 minutes and 30 seconds out of 10 minutes. It could be safe to assume this percentage of the data reflects the participants' behavior. Furthermore, using a threshold that has been used by other studies in the field makes it possible to start establishing some standards that can easily be followed and will, eventually, bring more credibility and robustness to the methods we apply.

Once confirmed that this method was the best suited to gauge the eye-tracking data quality, I used the threshold to see which participants would be discarded. In the end, all the recordings of participants P18 and P22 as well as the Clip 3 recording of P03 and the Clip 1 recording of P17 were removed from the dataset. Interestingly enough, I did not find any overlapping between the participants flagged based on the fixation measures and the recordings excluded based on the gaze time on screen. This confirmed the impossibility of combining the two methods, at least until a reliable golden standard is defined in terms of mean fixations for subtitle reading and video exploration. One additional participant, P37, was removed from the analysis regardless of the good quality of his recordings. During the interview session, it became evident that P37 had found information relevant to the study, probably on my personal webpage where a summary of the research as well as my previous conference presentations were available. Facing possible bias due to this additional information, I decided to remove his recordings to preserve the quality of the data.

4.2.6. Eye-tracking data elicitation

Eye-tracking data, as it has been used specifically in Translation Studies, can be classified into two categories: attentional data and cognitive data. The eye tracker output, as raw data, consists of a series of data points recording eye movements every 8.3 ms when the sampling data rate is 120Hz. Each data point consists of a timestamp, an X and Y coordinate and the pupil size. This means there are 120 data points per second, which represents an enormous and unwieldy amount of data. The process of transforming this raw data into visualizable and manageable data requires the application of a fixation filter. Tobii Studio includes a series of fixation filters that can identify and filter out fixations from the raw collected data. Detection filters consist of a

series of transformation steps that are followed to classify eye movements. Different detection filters use different algorithms, which differ primarily with respect to the type of eye movement that is of interest. For processing my data, I used the Tobii IV-T fixation filter (Tobii Technology 2012) provided by Tobii Studio. The most interesting sub-set of eye movements relevant for my research were fixations, so I used a fixation classification algorithm rather than a saccade classification algorithm. However, Tobii IV-T Fixation Filter also offers information about saccades. Tobii IV-T is a velocity-based algorithm that identifies fixations based on the speed of the eyes moving between different data points. The filter assumes that low velocity among data samples indicates a fixation and high velocity, a saccade.

Figure 5. Fixation and saccades

Among the different possible classifications of the movements the human eye can make, the most relevant and widely reported in eye-tracking studies are of two events: fixations and saccades (Holmqvist 2011). *Fixation* refers to the periods of time when the gaze focuses on a specific point and the eye remains relatively stable. As Duchowski puts it, "[f]ixations are eye movements that stabilize the retina over a stationary object of interest" (2007:46). The name could be somewhat misleading, because even if the eye is focusing on a given object, it is never still. Fixations are made of miniature eye movements, involving microsaccades, drift and tremor. As indicated by the raw eye-tracking data, every fixation is actually made of a grouping of data points reporting

those micro movements that are later *combined* into a fixation because the movements among them are too slow. *Saccade* refers to the rapid and sudden movements that occur when the eye is shifting focus from any area to a new one. Duchowski defines them as "rapid eye movements used in repositioning the fovea to a new location in the visual environment" (2007:42). It is equivalent to re-adjustment of the visual attention. Saccades occur in-between fixations and their spans depend on the distance between the previous and the new fixation. No visual information is acquired by the eye during the saccadic movements. An example of the visualization of fixations and saccades can be seen in Figure 5.

To facilitate the analysis of the captured data, Tobii Studio offers the possibility of drawing *areas of interest* (AOIs) around the elements that are more relevant to the researcher depending on the hypotheses that are being tested. In the case of eye-tracking data from subtitled material, the standard practice is to draw an AOI around the subtitles (Subtitle AOI) and another area of interest for the rest of the image (Image AOI). Figure 6 shows an example of the AOIs I drew for analyzing my data in Tobii Studio. AOIs can later be used in the analyses in various ways: fixation data can be filtered based on the duration and number of fixations enclosed within each area.

Figure 6. Areas of Interest
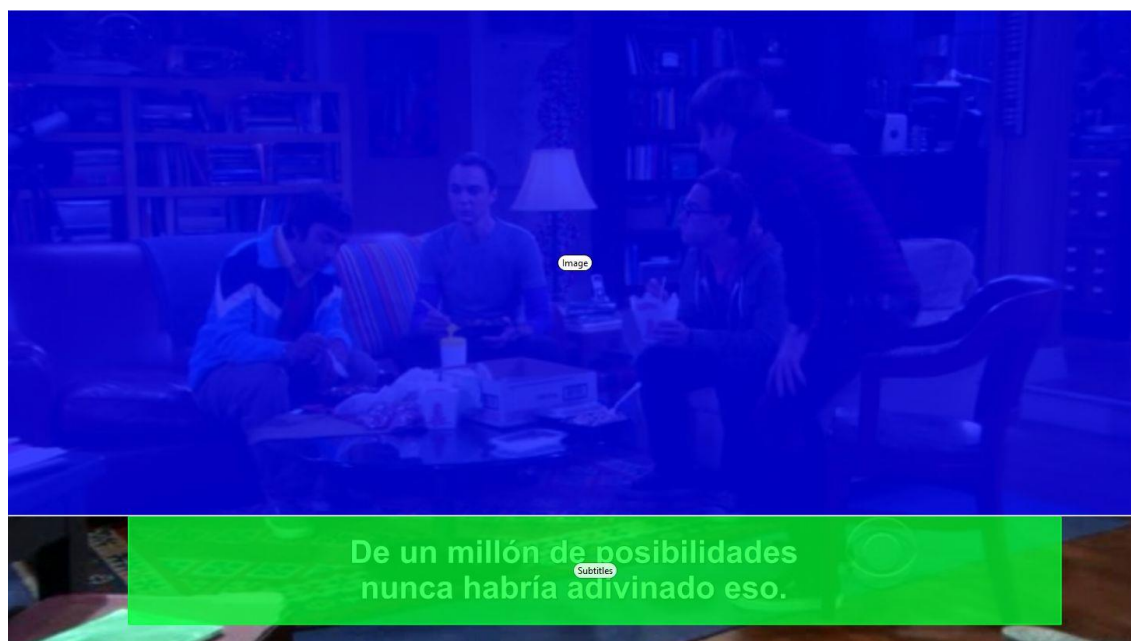
For analyzing the data in my pilot study, I created interactive AOIs for the subtitles. The area would activate and deactivate every time a subtitle was shown on the

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screen. This was a very time consuming task because the onset and offset time for each subtitle had to be set manually. Furthermore, AOIs are test- and media-dependent, that is to say, if the Clip 1 for Tests 1 and 4 in Tobii Studio were exactly the same, I would still have to repeat the whole process twice. Apart from the time required to apply this approach, it could also be argued that latency would then become a problem because participants could go to the subtitle area to look for information that was no longer there, but their *intention* was still to rely on the subtitles. Along the same lines, the method would not account for the times when participants continued to fixate on the subtitle area even when the subtitle itself had already disappeared. Kruger and Steyn (2014:109) comment on the fact that collecting eye movement data "when there are no subtitles on screen [can] further skew the data". To assess the impact of this problem, I decided to run a test with the pilot study data before processing the main experiment data. I compared the results obtained from using both dynamic AOIs and static AOI for all the recordings and I found an average 4% difference among all the recordings. Based on these results, I decided to use only static AOIs for processing the data for the main study.

Thus, the preparation stage consisted of gauging the quality of the data, applying the appropriate filters, and defining the AOIs. Once these steps are covered, in most cases, the data are exported from Tobii Studio to be processed with other type of software, such as Microsoft Excel or SPSS. Tobii Studio by itself offers some data analysis tools, however these are highly restrictive and allow little control over the way the data is handled. I used Tobii Studio mostly for visualizing the data, and I then combined it with MS Excel and SPSS to explore and summarize the data in different ways.

4.2.7. Types of eye-tracking data

The previous section presented the type of standard data offered by the eye tracker. These measurements are used in different ways depending on the nature of the research, the purpose of the project and the literature in the specific field. In their book on research methodology in Translation Studies, Saldanha and O'Brien (2013) refer to three types of data provided by eye-tracking methods that can be analyzed in translation studies: temporal data, attentional data and data related to cognitive effort. A summary

of the types of data and the methods of exploration used in this project is given in Table 1.

Table 1. Type of eye-tracking data and methods of exploration used (adapted from Saldanha and O'Brien 2013)

Type of data	Methods of exploration
Temporal data	Total fixation duration
	Total fixation count
Attentional data	Gaze plots (gaze replays)
	Heat maps
	Attention shifts
	Skipped subtitles
Data related to cognitive effort	Distribution of the fixations
	Fixation duration

Temporal data

In reception studies, the most appropriate analysis of temporal data is what Saldanha and O'Brien (2013:143) call a "micro-level analysis". The eye tracker provides information about how much time in total is spent on each of the areas of interest: the subtitle and the image. The count and the duration of the fixations on a given area can be automatically obtained from Tobii Studio or manually calculated in Microsoft Excel using the data exported from Tobii Studio.

Attentional data

This is the type of data that offers most of the information for my research. Attentional data result from exploring where the focus of attention of the participants is and how the participants distribute their attention among the different areas of interest: most fixated areas, order of the fixation, revisits to a given area, etc. As mentioned above, to test my hypotheses and answer my research questions, I rely mostly on the fixation data provided by the eye tracker.

These types of information can be extracted and visualized using different methods. Tobii Studio allows gaze visualization replay, which provides a visual rendering of the fixations superimposed on the element. Additionally, I also tested the software ESE – Eye Scanpath Explorer[1], version 4.3 with the data from my pilot study. A visual inspection can tell the researcher a lot about the viewer's attention distribution

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[1] Software developed by Dr. Marco Porta at the University of Pavia. Dr. Porta kindly accepted to reconfigure it so I could use it for analyzing my data.

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by representing the flow of attention to a specific segment. Figure 7 shows the result of a 4.6-second *gaze plot*, equivalent to one two-line subtitle, for P05PS in the pilot study. It can be seen that fixations are represented as circles and their size varies depending on their duration (the bigger the circle, the longer the duration of the fixation). The fixations are numbered but, additionally, ESE uses different colors to indicate their order. Thus, the brighter green indicates the first fixation and the brighter red, the last fixation within this segment. Saccades are represented as lines joining one fixation to the next.

Figure 7. Scanpath as displayed in ESE

Another method used to explore visual attention data is the identification of the most fixated areas. An extended technique for this in eye-tracking software is the production of *heat maps*. Tobii Studio can create heat maps based on the gaze data collected for each recording. The main advantage of heat maps is that they can summarize all the fixation data from one or several recordings into one image in an intuitive way. The visual representation offered by a heat map helps the researcher to identify areas where most people looked for a longer period of time or areas with the higher concentrations of fixations. Nevertheless, any qualitative result or conclusion drawn from heat maps should be taken with caution. In order to provide a broader picture, heat maps obviate temporal and individual data, making them misleading in some circumstances. The main application of the heat maps when using subtitled

material is the definition of the AOIs that will later be used to analyze the data at different levels.

The heat map in Figure 8 shows the pattern of colors that are used by Tobii Studio to create the hot spots. The most fixated areas on the image are represented in red; the yellow areas represent the less fixated areas; and green indicates the least fixated regions. The areas that were not fixated at all remain uncolored.

Figure 8. Heat map with colored areas representing the areas most fixated upon

The change of focus of attention is another measure that gives information about the participants' behavior when watching subtitled material. *Attention shifts* indicate when the attention focus shifts from one AOI to another. Tobii Studio does not include a tool to report this measurement since the analysis is normally restricted to each AOI instead of the participants' interactions between them. ESE software can nevertheless process this information. It allows the researcher to draw a horizontal line along the screen and create a report of the number and duration of fixations above and below the line, as well as the number of times a saccade crosses the line. The analysis provided by ESE is neat and useful, but the preparation of the material and the extraction of the results are very time consuming. The researcher needs to input a visual representation of each subtitle, a file with the time stamp of the subtitles for each recording and a file with the fixations captured in each recording. For the pilot study, I created the necessary 584 screenshots for the subtitles, one for each; plus nine subtitle time code files and 24

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fixation files, three per participant. The functioning of the program with the data was satisfactory. Figure 9 shows the summary information provided by ESE. However, the results for each set of subtitles had to be collected manually in a spreadsheet because the software lacks an option to automatically export the results. Considering the amount of time that would have been required to apply the same procedure in the main experiment, I opted for a different option. With the support of a computer scientist, I calculated the attention shifts by exporting the data to Excel and then use a Python script that created an additional column with the shifts between the two AOIs.

Figure 9. Close-up on ESE summary information for subtitle segment
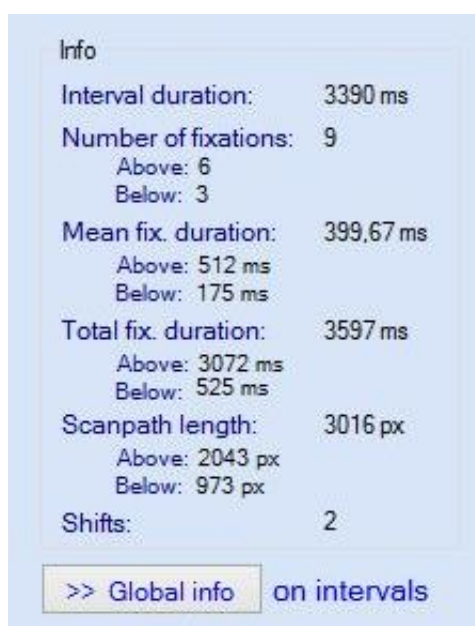
Finally, one type of attentional data that has been commonly used in subtitling studies involving eye-tracking is the number of skipped subtitles (or actually read subtitles, depending on the researcher's approach). Attentional data can help identify exactly which subtitles were actually read by the participants and which were skipped. One way of calculating this is by using formulas in Microsoft Excel to analyze the shifting between AOIs. Nevertheless, it would require the creation of one AOI per subtitle, which would also require a significant amount of time and effort. Considering this, another Python script was used to map the participants' fixations on the subtitles depending on the time in the recording when the fixations occurred, along with their X and Y coordinates.

Data related to cognitive effort

Some of the measurements provided by eye trackers can be seen as indicators of cognitive effort. Pupil dilation is also considered a trustable but problematic indicator of cognitive effort. For this project, I used fixation in three different manners as an indicator of cognitive effort: *mean fixation duration*, *Percentage of fixations per AOIs* and *percentage of duration of fixations per AOIs*. As mentioned in Section 4.2.5.4, the *mean fixation duration on the image* and the *mean fixation duration on the subtitles* vary because they represent two different types of information offered to the viewer and they are processed in different ways.

Calculating the percentage of time out of the total time that is invested in each AOI helps identify the areas most used by the participants and can also help reveal the ways participants behave when watching the subtitles. For example, an exceptionally long fixation on the subtitle area might indicate higher cognitive effort, since the fixated element required more time to be processed. For participants who do not rely on subtitles as their main source of information, an incidental fixation on the subtitle area might indicate the need to confirm something that escaped the participant's listening abilities, something that requires an input channel additional to the main channel being used, or a strategy to cope with missing vocabulary in the source language.

4.2.7.1. Tobii Studio log files

Although some results can be obtained directly from Tobii Studio, parts of the analysis were carried out using other programs (Microsoft Excel, SPSS, ESE), particularly the statistical analysis. To make the files available, I made an inspection of all the possibilities of exporting files from Tobii Studio. The program offers a pool of different types of data to be exported and it is necessary to make an adequate selection to ensure the exported files include all the information needed. At the same time, this process helps avoid redundant information since some of the types of data are very similar. If the selection is not done carefully, the researcher could end up with incomplete data or with unnecessarily large files. The participants' recordings were exported by clip, so I had three files for each participant. Data log files are organized by fixations. Each row in the file represents a fixation identified by Tobii Studio using the IV-T filter. Files contain 22 columns, including time stamps, X and Y coordinates, validity, AOIs and register log information. Figure 10 shows a sample of a file exported from Tobii Studio.

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Figure 10. Example of log file exported from Tobii Studio

StudioTestName	ParticipantName	RecordingName	RecordingDate	RecordingDuration	MediaName	SegmentName	SegmentStart	SegmentEnd	SegmentDuration	RecordingTimestamp	LocalTimeStamp	EyeTrackerTimestamp	FixationIndex	GazeEventType	GazeEventDuration	AOI[Subtitles]Hit	AOI[Image]Hit	GazePointX (ADCSpx)	GazePointY (ADCSpx)	ValidityLeft	ValidityRight
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	475219	14:20:45.017	1378815543864890	30	Fixation	217	1	0	1053	910	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	474969	14:20:44.767	1378815543615130	29	Fixation	200	1	0	789	895	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	474786	14:20:44.584	1378815543431870	28	Fixation	133	1	0	887	907	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	474553	14:20:44.351	1378815543198740	27	Fixation	150	0	1	757	281	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	474420	14:20:44.218	1378815543065490	26	Fixation	117	0	1	711	259	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	474087	14:20:43.885	1378815542732470	25	Fixation	266	1	0	1160	985	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	473837	14:20:43.635	1378815542482610	24	Fixation	200	1	0	1062	995	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	473554	14:20:43.352	1378815542199460	23	Fixation	250	1	0	1084	976	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	473354	14:20:43.152	1378815541999700	22	Fixation	117	1	0	1040	946	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	473152	14:20:42.652	1378815541500060	21	Fixation	200	1	0	759	974	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	472854	14:20:42.369	1378815541216920	20	Fixation	167	1	0	781	903	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	472571	14:20:42.186	1378815541033660	19	Fixation	150	1	0	1192	366	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	472388	14:20:41.970	1378815540817280	18	Fixation	150	1	0	819	499	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	472171	14:20:41.786	1378815540634030	17	Fixation	183	1	0	462	98	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	471988	14:20:41.586	1378815540434140	16	Fixation	283	1	0	639	485	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	471788	14:20:41.237	1378815540084510	15	Fixation	250	1	0	909	984	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	471439	14:20:40.887	1378815539734740	14	Fixation	100	1	0	678	988	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	471089	14:20:40.720	1378815539568240	13	Fixation	217	1	0	717	978	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	470922	14:20:40.454	1378815539301730	12	Fixation	466	1	0	1188	948	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	470656	14:20:39.854	1378815538702010	11	Fixation	167	1	0	1024	947	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	470056	14:20:39.604	1378815538452320	10	Fixation	100	1	0	924	949	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	469806	14:20:39.471	1378815538319190	9	Fixation	216	0	1	737	962	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	469673	14:20:39.188	1378815538036060	8	Fixation	383	1	0	957	973	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	469390	14:20:38.772	1378815537619670	7	Fixation	167	1	0	1101	1000	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	468974	14:20:38.572	1378815537419790	6	Fixation	266	1	0	1143	995	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	468774	14:20:38.489	1378815537336530	5	Fixation	67	1	0	936	989	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	468424	14:20:38.222	1378815537070160	4	Fixation	167	1	0	638	926	0	4
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	468124	14:20:37.922	1378815536770390	3	Fixation	266	0	1	642	978	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	467875	14:20:37.673	1378815536520500	2	Fixation	200	0	1	1084	931	0	0
Test1_N1N2P	P01.01.10092013	P01.01.10092013	10/09/2013	1177027	C2_TBBT_0211_NP2.avi	C2NP2P01	467601	662904	195303	467641	14:20:37.439	1378815536287370	1	Fixation	117	1	0	639	485	0	0

4.2.8. Questionnaire and interview data

Pre-experiment questionnaires were administered on paper to make it possible to collect data from a large population at the same time. As explained in Section 4.2.1 I needed to be with the participants while they filled out the questionnaires, which made it impossible to use online questionnaires and motivated me to look for strategies to apply the questionnaires to groups of people at the same time instead of individual respondents. These questionnaires were entered into a spreadsheet and constituted a data base completely independent from the database containing the information from the second stage of the research, the eye-tracking experiment.

As indicated above, to prevent participants from shifting position during the eye-tracking recording, the questionnaires used during the eye-tracking session were answered verbally and recorded. The participants' answers to these questionnaires as well as the interviews were transcribed in their entirety. I decided to refrain from making a phonetic or annotated transcription of the recordings because it would have involved an extensive and probably unnecessary effort, given the type of analysis. Aiming at fidelity and correctly representing the participants' opinions, the quotes from the interviews that are included in this thesis were double-checked before their inclusion. The interviews with the participants were held in Spanish. Whenever I quote excerpts from the interviews, I first present them in Spanish and then offer my own translation into English.

After transcribing them, the responses to the questionnaires were tabulated and transferred to a spreadsheet. The answers to the content cued and free recall questions were given a "1" when right and "0" when wrong. The values of the Likert scales were transferred directly to the spreadsheet. The results of the eye-tracking questionnaires were tabulated and added to a database containing metadata information from the participants and the summary of the extracted eye-tracking data per participant. The resulting database thus included all the necessary variables required to test the hypothesis and could be imported into SPSS.

The remaining data pertained to the open-ended questions asking for the participants' opinions about the dialogues, the difficulty of following the subtitles, and their enjoyment. These data were kept in a different file, along with the interviews. The transcriptions were intended to be analyzed qualitatively only and to lead to conclusions about the participants' reception in terms of the third *R* proposed by Gambier (2006):

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the *repercussions* at the personal and social levels. The transcription of the interviews and the answers to the open-ended questions were put together in a file. Since the interviews were semi-structured, I arranged the participants' interventions according to five broad categories:

1.   Opinions about different translation modalities

2.   Use and reasons to use non-professional subtitling

3.   Opinions about subtitling

4.   Benefits of using subtitling

5.   Use of audiovisual content

Once the interviews were categorized into these five groups, I re-read them and selected the more interesting points to help me build the profile of the participants of the project and define how they engage with audiovisual content and subtitling.

4.3.   Population and sampling

As pointed out by Gambier (2003), viewer preferences respond to different patterns and there are various elements to be considered when defining the profile of viewers. Defining the profile of the viewers that would be included in the study was a fundamental problem. The age group of the participants for this project was defined based on the key demographic most widely used for the TV shows produced in the United Stated: prime-time audiovisual products target an audience between 18 and 49 years of age (Storey 2009). Applying only this key demographic to define the population of the study would be problematic since age would become a prominent variable to be considered in the analysis. To control this variable and combine the key demographic information with the most common age group of students at the university, participants for this study were envisaged to be university students ranging from 18 to 30 years of age. Given that the study explores the reception of audiovisual products among regular viewers, the profile of the participant is then 18 to 30 year-old university student who is a regular user of audiovisual material in any form and also uses the Internet, since they were required to access the video material and the subtitles.

Convenience sampling was used to contact and select the participants. This means that participants are chosen from a population that is approachable by the researcher and probably willing to take part. The selection depends on the availability of prospective participants in the location where the research takes place, and the

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possibility of contacting the community and finding enough volunteers for the study. Since the study involved the use of an eye tracker, the data-collection method influenced greatly the decision to use convenience sampling. It was judged more practical to request participants to come to a laboratory on the university campus than to have different data-collection locations or take the eye-tracking equipment to other places. Moving the eye-tracking equipment would have brought up additional issues to deal with (Teixeira 2014) such as additional transportation and insurance expenses, time invested in setting the eye-tracking equipment up, higher risk of data loss, and the impossibility of maintaining a similar environment for all the sessions.

Participants were contacted during classes at the Faculty of Letters, the Faculty of Engineering and the Faculty of Law, or in small groups or individually at the library of the Campus Catalunya at the Universitat Rovira i Virgili. The subtitles for the material used in the experiment were in Spanish, given the location of the university and the market distribution policies for TV products that apply to the locale. Distribution companies, in this case, Warner Bros Spain, rarely include translation into Catalan, so only Spanish subtitles or dubbing are available. Catalan viewers are used to watching TV series and films in Catalan and Spanish, as only the regional channels screen audiovisual programs in Catalan. The participants were native speakers of Catalan and/or Spanish. The selection process was conducted in two steps due to delays caused by the university summer break: data from the first group of participants were collected in May 2013 and from the second, at the beginning of September 2013.

A key issue that had to be addressed in the sampling process was how to test the participants' proficiency in English in order to classify them into groups, since that would help define their suitability for the study. One of the main limitations on this type of study is that large sample sizes cannot be used in translation-related studies using eye tracking. The amount of time required to collect and process the data imposes a limit on the number of participants included in the studies (O'Brien 2010); there are studies with only five participants, most include between 10 and 25, but there are exceptions, with studies with up to 88 participants.

The research design included both intra- and inter-subject analyses. This means each participant would watch each clip under one condition only, so I could measure all three types of subtitling, but did not watch any clip more than once. This was intended to help avoid any carry-over effect and collect as much data as possible from the

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participants. Considering the two levels for the *Level of L2/L3* independent variable (HLE=High level of English and LLE=Low Level of English) and the three levels for the *Type of subtitle* independent variable (PRO=professional version, NP1=non-professional 1 and NP2=non-professional 2), the factorial table has six different conditions for each clip.

Consultation with a statistician indicated that at least six participants were required for each condition in order to have statistically reliable results. According to Saldanha and O'Brien (2013:139) a 25% data loss rate due to dubious quality or lack of suitability of the data should be a reasonable assumption when defining the number of participants required for studies using eye tracking. Even though in my pilot study only the data from one out of the nine participants was eventually discarded, I decided to follow this recommendation. Each participant would watch one clip under one condition, without repeating clip or condition. For instance, P01 watched Clip 1 with the non-professional version 1, Clip 2 with the non-professional version 2 and Clip 3 with the professional version of the subtitles. Thus, the design required at least eight participants under each condition, a total of 48 participants, in order to obtain enough good-quality data for at least 36 of them.

Table 2. Factorial table for the main experiment

	Clip 1			Clip 2			Clip 3		
	PRO	NP1	NP2	PRO	NP1	NP2	PRO	NP1	NP2
LLE	n=8	n=8	n=8	n=8	n=8	n=8	n=8	n=8	n=8
HLE	n=8	n=8	n=8	n=8	n=8	n=8	n=8	n=8	n=8

Participants: *n=48*

This project aims to determine how proficiency in the source language affects viewers' receptions, making it necessary to include participants with different levels of proficiency in L2/L3. Taking this restriction and the project's aim into account, I decided to exclude from the study participants with a middle level of proficiency in English and to compare the two extremes: participants with a high level of proficiency in English and participants with a low level of proficiency in English. Comparing the two groups, with high and low proficiency level, under the three subtitling conditions required a minimum of 48 participants. The decision not to include participants with a middle level of proficiency in English responds to a combination of reasons pertaining to the feasibility of the project: a third group would require about 24 participants more than initially planned. Considering that I was using three data collection methods and

taking into special consideration the amount of data generated by the eye tracker, this would mean a significant increase of about three months of additional work in the selection and engagement of participants and the collection and processing of additional data.

While the decision to exclude the middle group is efficient for the project and is ecologically valid, it is not without consequences. The first hypothesis related to the reception of professional and non-professional subtitling could be directly affected, since the group in the middle could have a behavior that is different from that of the participants in the other two groups. On the other hand, this decision was the reason why the second hypothesis became more relevant after a first analysis of the data: it was possible to see a clear difference between the two groups and the variations in the behavior of the participants. The data collection methods used, especially the eye tracking, produce large amounts of data; tradeoffs of this nature are necessary to narrow down the focus of the project and maintain its feasibility.

With these considerations in mind, it was necessary to have the appropriate tool to classify the participants into groups. Given that the regular standardized tests are designed to assess a wide range of language skills, I decided to develop a special proficiency test to select the participants according to their listening-comprehension skills alone and filter only the volunteers that would be suitable for the study. I designed a listening-comprehension test using an excerpt from the same TV series used for the experiment, *The Big Bang Theory*. As Thomas (1994:322) explains, tests designed for specific purposes have "the advantages that if all participants are tested uniformly, proficiency within the sample may at least have internal consistency and that subgroups may be compared with respect to proficiency on some rational basis." Although understanding a foreign language involves more skills than listening, it could be argued that audiovisual products are regularly used to assess listening comprehension. It is accepted that listening skills are more active when understanding this type of product and my decision to rely on a test focused exclusively on listening skills to classify the participants is grounded on that assumption.

4.3.1. Participants

A total of 377 students from the university completed the pre-selection questionnaire (Section 4.2.1) and took the listening-comprehension test that aimed at screening the

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population. From this sample, only 332 (193 women and 139 men) were considered suitable for the study, since 45 of the respondents did not meet one or several of the characteristics defined in the participants' profile: age, mother tongue(s), audiovisual product consumption or Internet use.

The listening-comprehension test gave 133 (40%) participants in the High Level of English group; 142 (43%) in the Middle Level of English group, and 57 (17%) in the Low Level of English group. Excluding the Middle level, there were 191 prospective participants available. However, since I could only reach those participants who had provided their correct contact details, I could only contact 151 participants to invite them to continue with the study. In the end, 54 students volunteered to participate in the main study, but only 52 of them were able to complete all the stages of the project. It was impossible to calibrate the eye tracker for two of the people who volunteered. Table 3 shows the distribution of the participants in the main experiment. The final sample was configured as follows: the High Level of English group included 21 women and 5 men (ranging from 18 to 30 years, M=20.6, SD=3.29) and the Low Level of English group was made of 14 women and 12 men (also ranging from 18 to 30 years, M=21.7, SD=3.23).

Table 3. Participants included in the main experiment

	Clip 1			Clip 2			Clip 3		
	PRO	NP1	NP2	PRO	NP1	NP2	PRO	NP1	NP2
LLE	9	8	9	9	9	8	8	9	9
HLE	9	8	9	9	9	8	8	9	9

Participants: *n=52*

There is a clear gender imbalance in the High Level of English group. Nevertheless, this imbalance also reflects the results of the pre-experiment questionnaire. Men comprised 38.4% of the Low Level of English group, while only 28% of respondents placed in the High Level of English group were men. Furthermore, among those participants who provided their contact information in the pre-experiment questionnaire, only one third were men. This imbalance is reflected at the general student population. According to data provided by the university's Gender Equality Observatory, of the students registered for the academic year 2012-2013, 7077 (60%) were women and 5560 (40%) were men. However, most of my High-level L2/L3 sample was made of students from the BA in English, in which the gender imbalance was more pronounced: 129 (75%) women and 44 (25%) men.

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Considering the imbalance between the two groups, I decided it was also important to test gender as a variable in the statistical analyses. Since the Low Level of English group does have balance between the two genders, I tested this variable in them to see if there was any effect.

The success of the study depended greatly on the number of participants that were willing to volunteer and offer their time to complete the different stages of the project. With this in mind, it was clear I needed to approach as many students as possible in the first stage to make sure I would have enough participants for the second stage. I contacted lecturers at three faculties at the Universitat Rovira i Virgili and they allowed me to come to their classes, where about 20 minutes were allocated for their students to complete the questionnaires. When I came to the classroom, first I explained the broad objective of the project to the participants, without any reference to subtitling, and then asked them to fill out the pre-experiment questionnaire. Once they all had finished the questionnaire, I distributed the listening-comprehension test and showed the video.

I also contacted participants directly at the library in the Campus Catalunya of the Universitat Rovira i Virgili, where I used a tablet to show them the video. The order of administration of the tests remained the same: they filled out the pre-experiment questionnaire first and then took the test.

Subsequently, I processed the questionnaires and tabulated the results. I then identified prospective participants based on the listening-comprehension test results and the answers to the questions related to audiovisual material consumption. I contacted these prospective participants by e-mail or mobile phone (depending on the information they had provided) and asked if they were willing to continue with the study. I explained the characteristics of the second stage of the study, detailing the amount of time they would be asked to dedicate to the session, the voluntary character of their participation, the conditions under which the experiment would develop and their rights. To keep track of the appointments and make it easier for the participants to select one, I created a spreadsheet in Google Docs so participants would be able to check in real time the time slots that were available for them to come to the laboratory.

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4.4.   Materials

The selection of the material for the study was an essential aspect to be carefully considered during the design. Depending on the type of material included, the study could have gone different ways. Initially, one of the options for the experiment was to use video material in a language that is unfamiliar language to the population (e.g. Hungarian, Korean or Japanese). Nevertheless, as the decisions were made to shape the design and narrow down the aim of the study, it became evident that one of the most important aspects of the project was to test the everyday use that viewers make of non-professional subtitling. Spanish and Catalan television channels regularly carry material produced in English and translated into Spanish or Catalan – the latter in the case of the regional channels. Although most products are dubbed, the expansion of digital TV and the accessibility guidelines have open the door for a growing market of subtitled products. Unlike the case with products in unknown languages, the viewers' familiarity with the product and the language might in turn become one of the key aspects that can provide ecological validity to the experiment and open up interesting research avenues. On the one hand, non-professional subtitle production depends very much on the popularity of the TV series, with the subtitles for the most popular TV shows being produced more quickly because people are more interested in them (Massidda 2012). On the other, the viewers' attitudes and the genre also affect the reception of the product (Gambier 2003:185). These two arguments mean that selecting a popular TV show should probably give an evaluation that is closer to participants' everyday life than selecting material that is totally unknown to the viewer. The participants could relate more easily to the content and, at the same time, to the presence of non-professional subtitling.

Further, this also allowed the project to move towards the exploration of variation between people with different levels of proficiency. At the beginning of the project, I did not intend to explore this difference in the use of subtitles as a main variable, but it gained importance as the project progressed. For similar reasons, only one audiovisual genre (comedy) was included in the study and only one TV show, in order to avoid adding one additional variable to the study.

Nevertheless, this approach is not without its problems. Using a TV show that is familiar to the participants as testing material introduces a further factor that has to be controlled. It is necessary to confirm what the participants' degree of familiarity with

the material is. As will be detailed in the following sub-sessions, this factor was taken into account at the level of the three clips included in the study as well as the chosen TV series. After they were shown each clip, the participants taking part in the eye-tracking session were asked if they had seen the episode before. The answers to this question were included in the statistical analysis.

4.4.1. Audiovisual material

Three excerpts, of between 3:08 and 3:55 minutes, were selected from the second season of the popular sitcom *The Big Bang Theory* (CBS 2007–). The show focuses on the lives of five characters: Leonard, an experimental physicist; his flatmate Sheldon, a theoretical physicist; their two equally geeky and socially awkward scientist friends Howard and Raj; and their neighbor Penny, an aspiring actress who works as a waitress. The show builds its comedy around the contrast between the geek characters' intellect and lack of social skills and Penny's outgoing personality and low level of education.

Since it was first released in the United States in 2007, the show has proved to be an international success, as indicated by the number of nominations it has received and the large audience ratings it has maintained. Its viewership was 8.31 million viewers in its first season and increased to 20.44 million for its seventh season (2011-2013). Additionally, the show is also of considerable importance for the non-professional subtitling phenomenon. Since 2010 it has always appeared consecutively in the top five of the *Most Pirated Shows* list collected and published yearly by TorrentFreak. The list does not take into account direct downloads or streaming distributions, but serves as an indicator of the popularity of the show among the audience that uses P2P network to access the content.

The selection of the scenes was guided by the principle of allowing comparison between the three excerpts. Primary importance was given to the narrative of the scene and the audiovisual language; thus the three clips correspond to full scenes in the episode. This is what generated the disparity in the length of the excerpt included in the study. The selected scenes were self-contained and no additional information about the TV show or the episode was needed in order to follow the story. The selected scenes were taken from episodes 4, *The Griffin Equivalency*; 11, *The Bath Item Gift Hypothesis* and 15, *The Maternal Capacitance*. The three scenes occurred during eating time (lunch or dinner) and took place in an interior setting where the four main male characters and

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another character participated in a discussion. In each of the excerpts the conversation revolved about two different topics, with all characters participating in the scene.

Table 4. Duration of clips and number of words in the original dialogue

Clip	Duration (seconds)	Uttered words	Words/second
Clip 1	217	400	1.84
Clip 2	188	477	2.54
Clip 3	225	517	2.30

4.4.2. Subtitles

Three sets of subtitles were included in the study: one professional version and two non-professional versions. The professional version (PRO) was taken from the DVD distributed in Spain (Warner Bros 2010). The two non-professional versions were taken from the two online communities: *aRGENTeaM* (NP1) and *TusSeries.com* (NP2). These two communities were selected because they were both active in 2008 (when the episodes were released) and their records indicated that the subtitles were produced internally. Additionally, both communities follow pro-am guidelines, which makes them comparable to the professional subtitles since they are targeted at similar audiences. The subtitles are distributed in the form of .srt files instead of embedding them in the video file. The description of the production processes followed to create the subtitles as well as the internal structure of these communities fall beyond the scope of this thesis. A description of the workflow and structure of aRGENTeaM can be found in Orrego-Carmona (2011) and a comparative account of both communities is included in Pym et al. (Forthcoming).

Table 5 shows the subtitle density for the three clips and the three types of subtitles. The subtitles are included in Appendix 2. As expected, there is variation in the length of the subtitles and the time they are shown on the screen. Since segmentation and length guidelines might not be the same, this variation is natural in subtitling. Nevertheless, the numbers are very similar, especially when it comes to the time per character and the number of characters.

I decided to include two non-professional subtitling versions because frequently there is considerable variation between non-professional subtitling communities. Furthermore, Spanish-language non-professional subtitling communities are very clearly divided between those translating into Iberian Spanish and those translating into

Latin-American Spanish. Users can very easily be exposed to both, and this could be a factor that sheds some light on the popularity or lack of interest in the subtitles.

Since the frame rates of the video versions are different, I decided to use two different versions of the video instead of altering the time codes. I prepared three versions of each clip using DVD Decrypter 3.5.4.0, FairUse Wizard 3D R2 and Total Video Converter 3.71 to extract the subtitles; I cut the video to the correct length and created the resolution appropriate to fit the screen: 1920×1080.

Table 5. Subtitle density per condition and clip

	Time/ Character	Characters /Second	Subtitles	One- liners	Two- liners	% Two- Liners	Characters	% Subtitles on Screen
PRO	*0.094*	*10.7*				*0.65*	*1693*	*73%*
Clip 1	0.089	11.3	72	30	42	0.58	1721	68%
Clip 2	0.107	9.4	64	23	41	0.64	1591	87%
Clip 3	0.087	11.5	66	18	48	0.73	1768	66%
NP1	*0.099*	*10.1*				*0.58*	*1790*	*81%*
Clip 1	0.102	9.8	70	27	43	0.61	1757	79%
Clip 2	0.098	10.2	72	32	40	0.56	1720	87%
Clip 3	0.096	10.4	66	29	37	0.56	1893	78%
NP2	*0.092*	*10.9*				*0.63*	*1714*	*75%*
Clip 1	0.094	10.6	66	22	44	0.67	1674	73%
Clip 2	0.093	10.8	57	22	35	0.61	1634	80%
Clip 3	0.089	11.2	61	23	38	0.62	1833	73%

4.5. Ethical considerations

It is becoming increasingly common in the humanities and social sciences to undergo an ethical approval process for the research projects involving copyrighted material and human participants. Considering 1) the nature of the translations under analysis in this project and 2) the inclusion of volunteer students in the study, the design of the present study followed the internal guidelines defined by the Intercultural Studies Group. At the time when these issues emerged for discussion, neither the Department of English and German Studies at the Universitat Rovira i Virgili nor the university had a regulation for this type of research project in the humanities. An ethics protocol was approved by the Department Board in June 2013 and the draft of a Code of Good Practices in Research was disseminated by the university in October 2013. Both documents postdate the beginning of my project, but the conditions of the experiment are nevertheless in line with the indicated regulations.

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The project includes the use of copyrighted material, segments of video with their accompanying subtitles in Spanish, as well as the non-professional subtitles created for that content by two different collaborative subtitling communities. The use of copyrighted material for educational and research purposes is allowed by the Spanish intellectual property law, Legislative Decree 1/1996, amended by Law 23/2006 and Law 21/2014, as long as the inclusion of the material is justified and the source of the content is properly mentioned. Further, for this project, the material is used for analysis purposes only. The video material used for the analysis is not published here or distributed by itself nor in its entirety, and only segments of the subtitles are included as appendices for illustrative purposes.

The project required a significant amount of personal information: the participants were asked private questions about their eyesight and eye problems; their voices were audio-recorded; their faces were recorded on video. In conformity with Intercultural Studies Group practice, I designed a detailed consent form (Appendix 1) that was presented to the participants. This included the details about the nature of the data collected (participants' voice and face recording, eye-tracking data) and the conditions for the management and storage of records. It also informed the participants about their right to withdraw from the experiment at any point, during or after the experiment, and also the appropriate channels of complaint in case they felt their rights were violated. All this information was also given to the participants verbally prior to the eye-tracking and interview sessions. To make sure the participants understood the type of data collected from them, at the end of the interview I showed them a sample of the recording of their gaze data and their faces and they were properly debriefed about the specific and detailed nature of the project. They were also offered the opportunity to ask questions on different occasions during the session and enough time was schedule between one session and the next in case any of the participants wanted to become more acquainted with the project or the data. All of them were told the results of the project would be shared with them once published.

4.6.   Procedure

As mentioned in Section 4.3, the first stage of the study entailed the collection of data from the university students in order to select the participants for the second stage. Participants were informed about the broad purpose of the research and were asked to

complete the pre-experiment questionnaire. As described above, the pre-experiment questionnaire aimed at collecting data on the participants' audiovisual consumption habits and served to test their listening comprehension in English. The results from these instruments served to determine the profile of the participants in order to choose those that could be invited to take part in the second stage of the experiment.

The eye-tracking session and the interview combined lasted between 40 and 60 minutes per subject. Prior to the experiment, I wrote a protocol for the eye-tracking and interview session so all participants received the same information. During the eye-tracking session, the participants watched the three clips, answered the experiment questionnaire and took part in the interview. Tobii Studio 3.2.1 was used to create the stimulus with the video excerpts and on-screen questions, collect gaze data and record the participants' verbal responses. When the participants arrived, I verbally informed them regarding their involvement in the study and their rights, and they signed the appropriate consent form (see Appendix 1). At the beginning of the eye-tracking session, the participants were asked about their active and passive use of English. After that, they read a synopsis of the TV series and watched the clips. The sequence in which the subtitles were presented was randomized so that the subtitles were presented in all possible positions (initial, medial and final). The randomization design included six sequences in which the subtitles were presented. The sequences were actually semi-randomized because the order of clips was not altered, only that of the subtitles. The reason for this was twofold: 1) rotating the clips would add complexity to the experiment design and would require more participants, since there would be 54 possible sequences of administration, and 2) the selected videos had already been assessed for comparability so that their individual differences would not affect the analyses.

Table 6 represents the way in which I rotated the presentation sequence of the subtitles (PRO=professional version, NP1=non-professional version 1 and NP2=non-professional version 2). By using this randomization and assigning the same number of participants to each order of administration, each type of subtitles would be presented the same number of times in each position, initial, medial and final, and all clips would have been seen by a uniform number of participants with each type of subtitles.

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Table 6. Presentation sequence used

Order	Clip 1	Clip 2	Clip 3
Test 1	NP1	NP2	PRO
Test 2	PRO	NP1	NP2
Test 3	NP2	PRO	NP1
Test 4	NP1	PRO	NP2
Test 5	PRO	NP2	NP1
Test 6	NP2	NP1	PRO

4.7. Pilot study[2]

The pilot study was carried out at the Universitat Rovira i Virgili in December 2012. The instruments and materials I used for the pilot study were exactly the same as those I later used for the main experiment. From a methodological point of view, the main objectives of the pilot experiment were to validate the combination of the data collected through the questionnaires, the eye tracker and the interviews, as well as the appropriateness of the listening-comprehension test as a tool to categorize the participants. From a pragmatic point of view, the pilot study served as a training experiment for me, with the main aim being to become familiar with the eye tracker and Tobii Studio software.

4.7.1. Participants

The group of participants for the pilot experiment comprised nine second-year undergraduate students from the BA program in English at the Universitat Rovira i Virgili (Spain): eight women and one man, ranging from 20 to 27 years (M=23.1, SD=3.0). I contacted students by e-mail and 15 of them volunteered to participate in the experiment. On the basis of the number of correct answers to the questions from the pre-experiment questionnaire, five students were placed in the low-level of English group (LLE), six in the mid-level group, and four in the high-level group (HLE). Participants in the mid-level group were not included in the experiment. All of them were L1 speakers of Catalan or Spanish and had normal vision or corrected-to-normal vision (by wearing glasses or contact lenses). The participants were deliberately only told that the research was related to media reception, in order to make sure their

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[2] This section replicates Orrego-Carmona (2014b) published in the volume *Translation Research Projects 5* (Torres-Simón and Orrego-Carmona eds. 2014)

attention to the subtitle area was not mediated by their expectations about the experiment. At the end of the experiment, I informed them about the specific purpose of the study.

4.7.2. *Procedure*

Prior to the experiment, I wrote a protocol for the eye-tracking and interview session. The experiment took place in the Aula d'Anàlisi de la Parla at the Universitat Rovira i Virgili during two weeks in December 2012. I arranged individual appointments with the participants. They selected a suitable time and date for the session and came to the laboratory individually. Upon arrival, I verbally informed them regarding their participation in the study and their rights, and they signed the appropriate consent form (see Appendix 1).

Table 7. Sequence randomization for the pilot experiment

Participant	English Level	Sequence	Clip1	Clip2	Clip3
P1PS	Low	1	NP1	NP2	PRO
P2PS	High	2	PRO	NP1	NP2
P3PS	Low	3	NP2	PRO	NP1
P4PS	Low	1	NP1	NP2	PRO
P5PS	High	5	PRO	NP2	NP1
P6PS	High	5	PRO	NP2	NP1
P7PS	Low	2	PRO	NP1	NP2
P8PS	Low	4	NP1	PRO	NP2
P9PS	High	6	NP2	NP1	PRO

Despite the low number of participants in each group, all six possible sequences were tested to identify any possible problem in the order of presentation or any problem emerging from using six different tests in Tobii Studio. I seated the participants in front of the monitor one by one, and calibrated the eye tracker to their eyes. Once the calibration process was successfully completed, I started the video playback. I assigned a sequence to each participant and showed them the three excerpts, alternating the three conditions, as shown in Table 7. After each clip, they orally answered the on-screen questions and recorded their answers with a microphone. Immediately after this session, they took part in the interview.

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4.7.3. Results

Only the results from eight participants are included here. In accordance with Caffrey (2009), the gaze data threshold was set at 85%. Participant P1PS was excluded from the analysis because the gaze data collected did not meet the threshold.

4.7.3.1. Eye-tracking data

Initial testing showed the presentation order of the subtitles for this sample is not a relevant variable for mean fixation duration ($F(5,18)=325.46$ p=0.545). The following results thus present statistical analyses regardless of the low number of participants included in this pilot experiment. Two areas of interest (AOIs) were defined for the analyses: a rectangle surrounding the subtitles (subtitle area) at the bottom of the screen and the rest of the screen, for the image area.

4.7.3.2. Fixation duration

The mean fixation duration for each participant, for each condition, was calculated by dividing the sum of the duration of the fixations by the number of fixations (Table 8). No significant difference was found between the mean durations of the fixations on the subtitle area among the participants based on their level of English ($F(1,18)=0.013$ p=0.909) nor the type of subtitle ($F(2,18)=0.867$ p=0.437). The same occurred with the fixations on the image area and the level of English ($F(1,18)=0.394$ p=0.538), and the type of subtitle ($F(2,18)=0.011$ p=0.989).

Table 8. Means fixation (in milliseconds) by area of interest, group and subtitle condition (PRO, NP1 and NP2)

	Subtitle area		Image area	
	Mean	SD	Mean	SD
Low Level of English (LLE)				
PRO	200.97	15.84	352.86	63.60
NP1	223.87	10.92	369.94	55.02
NP2	202.32	19.46	342.31	21.77
High Level of English (HLE)				
PRO	202.36	26.50	383.74	135.45
NP1	208.79	33.33	371.97	118.04
NP2	212.83	21.21	385.31	136.73

4.7.3.3. Number of fixations

As shown in Figure 11, in the LLE group, 44% of all fixations are on the image, while this number rises to 68% in the HLE group. Thus, there is a significant difference

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(F(1,18)=13.39 p<0.01) in the percentages of the fixations allocated to the image depending on the level of English, but this percentage did not differ significantly between the subtitle conditions (F(2,18)=0.137 p=0.873). A similar correlation with language level was found for the *percentage* of time allocated to the subtitle area (F(1,18)=13.39 p<0.01). A paired t-test showed there is a significant difference between the amount of fixations allocated to each area by the two groups, HLE (t(11)=3.31 p<0.01) and LLE (t(11)=-2.39 p<0.05).

Figure 11. *Percentage of fixations* on areas of interest by *Level of L2/L3* and *Type of subtitle*
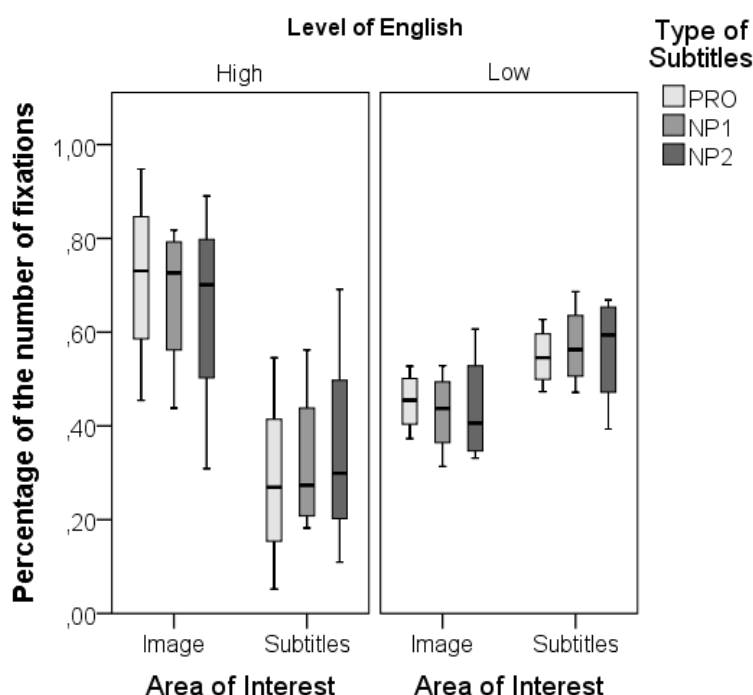
4.7.3.4. Percentage of duration of fixations

The proportion of duration of fixations on each area of interest (Figure 12) shows that both HLE and LLE fixated more on the image (77% and 56% respectively) than on the subtitle area (23% and 43%). As with the percentage of the number of fixations, there is a significant difference in the percentage of duration of fixations on the image (F(1,18)=10.83 p<0.01) and the subtitle area (F(1,18)=10.83 p<0.01) by *Level of L2/L3*, but the type of subtitle does not have a statistically significant effect. Within-group analyses also confirmed significant differences in the percentage of duration of fixations on each area for each group, HLE (t(11)=5.26 p<0.001) and LLE (t(11)=2.43 p<0.05).

A visual inspection of Figure 11 and Figure 12, as well as the standard deviations of mean fixations (Table 8), indicate that the data from HLE subjects have a greater

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dispersion than those from LLE participants, which is consistent with the different levels of proficiency. LLE participants rely mostly on the subtitles, while HLE participants might make a conscious decision about reading the subtitles or not. When comparing the percentage of fixations to the percentage of duration of fixations on the image and on the subtitle area, on average, participants in the LLE group have more fixations on the subtitle area than on the image, but their fixations are longer on the image than on the subtitles.

Figure 12. *Percentage of duration of fixations* on areas of interest by *Level of L2/L3* and *Type of subtitle*
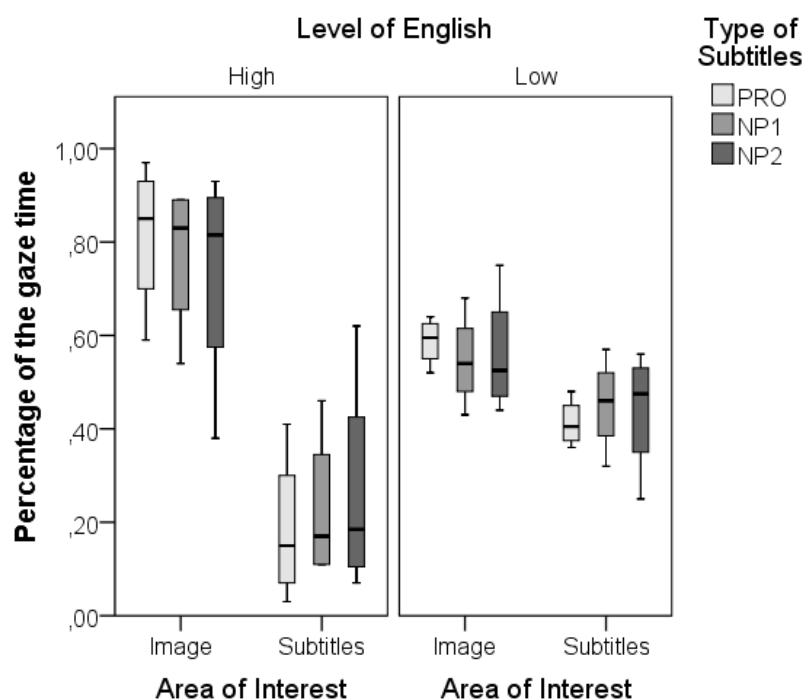
4.7.3.5. Comprehension questionnaire

Table 9 shows the percentage of correct answers by the participants under the three conditions. As can be seen in the means, the PRO condition ranks higher than NP1 and NP2 in both groups, with 76.7% correct answers in the LLE group and 83.3% in the HLE group. Analysis of the answers shows differences in the scores for the Verbal Attention questions, where the PRO subtitles correlate with better results than the other two versions: 70% for PRO condition and 40% and 50% for NP1 and NP2 among the LLE participants, and 87.5% for the PRO condition and 62.5% for both NP1 and NP2 in the HLE group. In the *Narrative attention* and *Iconic attention* questions, the PRO and NP1 subtitles give the same results in both groups.

Table 9. Percentage of correct questions by type of question and condition

	Verbal attention	Iconic attention	Narrative attention	Mean (cued recall)	Gist comprehension (free recall)
Low Level of English					
PRO	70.0	80.0	80.0	76.7 (*SD*=5.7)	100
NP1	40.0	80.0	80.0	66.7 (*SD*=23.1)	100
NP2	50.0	90.0	70.0	70.0 (*SD*=20.0)	60.0
High Level of English					
PRO	87.5	87.5	75.0	83.3 (*SD*=7.2)	75.0
NP1	62.5	87.5	75.0	75.0 (*SD*=12.5)	100
NP2	62.5	62.5	62.5	62.5 (*SD*=0.0)	75.0

As can be seen in Table 10, the mean self-reported comprehension ratings were positive and very similar: 4.0 for PRO and 3.8 for NP1 and NP2 in the LLE group and 4.2 for NP1 and 4 for both, PRO and NP2 in the HLE group, on a scale from 0=none to 5=very high. These do not reflect the differences found in the analyses of the comprehension questions.

Ratings of the difficulty of following the subtitles were also highly positive, with the only rating below 4.0 being 3.5 (where 0=very difficult and 5=very easy) for the NP1 in the HLE group. This difference is unexpected since participants in the HLE group were less dependent on the subtitles, but as can be seen in Figures 1 and 2, some participants in the HLE group did use the subtitles.

Table 10. *Self-reported comprehension* and *Subtitle-reading effort* by *Type of subtitle*

	PRO	NP1	NP2
*Self-reported comprehension**			
LLE	4.0 (*SD*=0.71)	3.8 (*SD*=0.4)	3.8 (*SD*=0.4)
HLE	4.0 (*SD*=0.8)	4.2 (*SD*=0.5)	4.0 (*SD*=0.8)
*Subtitle-reading effort***			
LLE	4.2 (*SD*=0.8)	4.6 (*SD*=0.5)	4.0 (*SD*=0.7)
HLE	4.2 (*SD*=0.5)	3.5 (*SD*=0.6)	4.2 (*SD*=0.5)

* 0=none and 5=very high

** 0=very difficult and 5=very easy

4.7.4. Discussion

The eye-tracking data show there is significant difference in the behavior of participants with different *Level of L2/L3*, with the participants in the LLE group spending around 56% of the time on the image area and participants in the HLE group spending around 77% on the image area. This difference fits in with comments made by the participants during the interviews, when some mentioned they use the subtitles as a support rather than as their main source of information. This also corroborates the initial assumption

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that participants engage differently with the content depending on their language skills. The participants' gaze behavior seems to be similar under all three subtitle conditions, which is supported by the fact that they did not mention significant differences between the subtitles during the interviews.

The results of the comprehension questions and the self-reported comprehension levels suggest different circumstances. Most of the participants mentioned in the interviews that, beyond this experiment, they had noticed low quality in non-professional subtitling generally available online, which relates to the widespread assumption of low quality in amateur translations. Nevertheless, when they were asked to assess the difficulty of following the subtitle versions included in this experiment, the ratings for all conditions were very similar. Additionally, when asked if they noticed any differences between the subtitles, they only mentioned subtitle speed and appearance on the screen as relevant factors. All of the participants said they had good comprehension of the material and the general comprehension ratings were high for most of the conditions, but actually their answers to the questionnaire show there are different levels of comprehension, depending on the type of translation, as seen in Table 10. This result might suggest that the participants' expectations do not necessarily correspond to a need to understand the content entirely. The results from the comprehension questionnaire show that the Verbal Attention scores have an impact on the overall result. This may be due to the small sample.

4.8. Lessons learned from the pilot study

As can be seen from the results of the pilot study, the combinations of tools proposed for the study worked satisfactorily. The analysis of the data suggests the proposed methodology is suitable for studying the reception of professional and non-professional subtitling, as well as exploring how people with different *Level of L2/L3* listening comprehension engaged with subtitles.

4.8.1. Revision of the instruments and the methods

The pilot study brought up important issues that were used to fine-tune the experiment design and procedure. The modifications that stemmed from the pilot study can be classified into two categories: procedural additions and questionnaire modifications.

Although the percentages of data collected were high in general and only one participant was not considered suitable for the analysis in the pilot study, I noticed that with some of the participants the eye-tracking data was consistently imprecise and drifted more than expected for a Tobii X120 eye tracker. Although the data was still usable since I was focusing on two areas of interest only, I thought this error could be solved by adding a dummy media as a confirmation of the calibration step. Thus, for the participants in the main experiment, I included a 40-second clip from the same TV show and used it to confirm the accuracy of the eye-tracking data before starting the session. Due to time constraints, I did this process intuitively, so in the cases in which the precision was not visually satisfactory, I readjusted the eye tracker and asked the participants to do the calibration process again.

The other addition I made to the research design was the insertion of an image presenting the characters that were taking part in the clips included in the experiment. Although *The Big Bang Theory* is a popular TV series, it became evident after the pilot study that not all participants knew the names of the characters. Since the name was used in the questions and some participants indicated this was a problem during the interviews, I decided to include this additional information to provide the participants with a safer starting point for the experiment.

Within the questionnaires, I made two changes. One of the verbal attention questions for the first clip was problematic since it asked the participants about the name of an object that was actually referred to in two different ways in the dialogues. This was problematic for the analysis because, depending on how the participants understood the question, there were two possible right answers. I replaced this question with another one. The second change had to do with the Likert scale used for reporting the participants' opinion about the dialogue. Initially, the scale had "muy aburrido" (very boring) and "muy inteligente" (very intelligent) at the two extremes. Some of the participants mentioned this scale sounded unnatural since they did not see *boring* and *intelligent* as opposites. Taking this into consideration, I changed "muy inteligente" for "muy divertido" (a lot of fun), which is considered an antonym of "very boring" and made more sense in the scale. The accompanying question in which I asked participants to give a reason for rating the clip as boring or fun was also changed accordingly.

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4.9.   Statistical analysis framework

Collecting data in naturalistic settings or ecologically valid laboratory conditions means dealing with a large number of variables that should be controlled or included in the analysis in order to provide reliable results that can be used to test hypotheses. Translation Studies scholars have mostly relied on descriptive statistics (typically means and percentages) and specific techniques of inferential statistics (mainly t-tests and ANOVA, as I did for the pilot study presented in this dissertation) to explore and test hypotheses. However, recently other statistical methods that take into consideration the variation between subsets of data have been judged better suited to process complex naturalistic-oriented data. Researchers in Translation Studies have advocated the adoption of mixed-effects models (Balling 2008; Hvelplund 2011; Green et al. 2013; Teixeira 2014). Being more suitable for naturalistic approaches, these models combine a variety of models in a unified approach that, among other practical benefits, "includes accommodation of unbalanced designs and longitudinal (dependent) covariates" (Green et al. 2013:444). Taking this into consideration, the present study uses descriptive statistics as well as linear and generalized mixed-effects models to analyze the data.

To provide a more accurate interpretation of the collected data, I used mixed-effects models with repeated measurements. The statistical analysis is carried out using the functions MIXED and GENLINMIXED in IBM SPSS Statistics version 22. The label "mixed models" refers to the fact the model integrates random and fixed effects in the analysis. As explained by Seltman:

> [F]ixed effects have levels that are of primary interest and would be used again if the experiment were repeated. Random effects have levels that are not of primary interest, but rather are thought of as a random selection from a much larger set of levels. Subject effects are almost always random effects, while treatment levels are almost always fixed effects. (2014:358)

Fixed factors (i.e. independent variables) are repeatable and the numbers of their levels "exhaust the number of all potential fixed factor levels that are of interest in a given study" (Hvelplund 2011:118). On the other hand, random factors are not repeatable and do not have a fixed number of levels. Random factors consist of a sample of a population that is not necessarily known. The participants in this study are included as random factors in the model. Different fixed factors can be added to the model and,

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since the model explores whether there is an effect of these variables on the dependent variable rather than requiring that the variables be controlled, it provides a more thorough analysis and offers more information for understanding the data.

Mixed-model analysis can include a large number of variables. The way to construct a model consists of running initial model with the variables that could have an effect on the dependent variable, then follow a step-wise procedure to reduce the number of variables (guided by the hypotheses and the researcher's assumptions), preserving only those that have a significant effect (Balling 2008; Seltman 2014). The rationale behind the inclusion of the variables is to test whether they turn out to be significant predictors of the dependent variable or not. In order to select the model, the variables that are found to be non-significant can be excluded from the model on multiple and successive tests as one moves towards the model that best describes the data. After removing non-significant variables, the model is run again with the fixed factors and the interactions among the fixed effects that have a significant effect on the dependent variable.

The process of variable selection should be carried out in a careful and systematic way. According to Balling (2008), there is ongoing debate about removal of non-significant variables. The consensus in exploratory data analysis seems to be to remove the variables in order to avoid non-significant variables from hindering the effect of significant variables (or vice versa) and to produce clearer results. However, the decision to select one model after creating a large number of possible models also generates theoretical problems and concerns. Following the approach recommended by Balling (2008) and applied by Hvelplund (2011) and Teixeira (2014), my models include only the variables that have a significant effect, with some specific exceptions: I keep the *Type of subtitle* or *Level of L2/L3* variables to illustrate their non-significant effect.

Like other linear models, linear mixed models assumed a normal distribution of residuals. Residuals are the difference between the data point and the value estimated by the model. A residual exploration needs to be included as a validation of the adequacy of the model. The model residuals can be plotted in a histogram as a way to confirm if the residuals distribution follows the bell-shape curve with the majority of them concentrated symmetrically around the mean. If residuals do not follow a normal

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distribution, the analysis could be misleading due to outliers and non-normally distributed data.

In the case of binomial variables, instead of using linear mixed models I used generalized linear mixed models. Generalized mixed models are an extension of linear mixed models that allow non-normal outcomes, including response variables with binomial distributions. As is the case in linear mixed models, the independent variables and interactions are added and tested in the variable selection process. The model is refined until only the variables and interaction with a significant effect on the target are kept. Once these variables are identified, the final model is constructed.

As can be seen in Section 4.1.4, the specific hypotheses postulated for this study explore the effect of one independent variable on one dependent variable. Nevertheless, the exploratory options offered by mixed-effects modelling foster further discussions and create room for the analysis of more complex relationships among different variables. Mixed models allow for the exploration of the effects of one or more independent variables as well as the interactions that occur among two or more of those variables.

These results of the model determine the significance of the factors in the model, but do not offer information about how the levels of the factors themselves differ. For each significant effect or interaction, it is necessary to run more tests to see how the different levels of the variable interact among them. Once a final model is reached, the estimated marginal means of the levels of each factor that yield statistically significant results are calculated and compared to the other levels of the variable. This analysis produces comparisons that show the differences in the estimated means predicted by the model for each pair of factor levels. The estimated marginal means obtained with these analyses are the mean response for the dependent variable, adjusted to the variables included in the model. Further, the estimated means are used to create boxplots that offer a graphical representation of the data, including the median and the intervals of confidence.

Chapter 5. Quantitative results

In this chapter I present the results of the statistical analysis of the data, concentrating only on the quantitative data collected. Section 5.1 uses descriptive statistics to analyze the data collected in the pre-experiment questionnaire. A general overview of the data collected in the main experiment is included in Section 5.2. The purpose of Section 5.3 is to present the results of the statistical analysis carried out for each dependent variable. This section starts with the preparation that was necessary for setting up the mixed-effects models and moves on to present the models created for identifying the significant effects and interactions of each variable. Finally, Section 5.4 summarizes the findings from the quantitative data and sets the stage for the discussion to follow in Chapter 6.

5.1. Pre-experiment questionnaire data[3]

The pre-experiment stage was based on a sample of 332 participants (193 women and 139 men) who provided complete and valid answers to the pre-experiment questionnaire and the listening comprehension tests. These participants had a mean age of 20.68 years (SD=2.8). The questionnaire aimed at screening the population in terms of age, mother tongue(s), and listening-comprehension level in English in order to determine whether they were suitable for the experimental stage. Additionally, the questionnaire collected data related to their means of access to audiovisual products, their audiovisual product consumption habits, and their regular Internet use.

5.1.1. Linguistic knowledge

All participants had Spanish or Catalan as their mother tongue. As explained in sections 4.2.2.1 and 4.3.1, at this stage participants were classified into three groups depending on their results on a listening-comprehension test. From the sample, 57 (17%) participants were placed in the high level of English (HLE) group, 142 (43%) obtained a

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[3] This section partially reproduces Orrego-Carmona (2014a).

score that put them in the middle level group, and the remaining participants, 133 (40%), were assigned to the low level of English (LLE) group. As discussed in Section 4.3.1, the participants for the second stage of the research were taken from the high and low level of English groups. In each group, 26 participants took part in the eye-tracking session and interview.

5.1.2. *Audiovisual consumption*

This initial questionnaire also collected general information on the participants' habits related to the consumption of audiovisual materials. The participants were asked, in Spanish, the following question: "On average, how many hours per week do you watch audiovisual material (TV series, movies, documentaries, music videos, video games)?". The answers were collected independently for each way of accessing the content: television, Internet, DVD/Blu-ray and cinema. Table 11 shows the frequencies of the responses to this question for all participants in the pre-experiment questionnaire. Television and the Internet were the most popular choices as means to access content, whereas going to the cinema or using DVDs and Blu-rays were not that popular. While the majority of participants who said they mostly use television to access content watch between 1 and 6 hours of television per week, *heavy* consumers were more inclined towards the Internet as their means to access content. About 50% of all participants declared that they watch more than 7 hours of audiovisual content on the Internet.

Table 11. Weekly consumption of audiovisual products in terms of time and means of access (pre-experiment questionnaire)

	Less than 1 hour	1-3 hours	4-6 hours	7-9 hours	More than 10 hours
Television	16.27% (54)	31.02% (103)	28.61% (95)	15.36% (51)	8.73% (29)
Internet	8.73% (29)	18.98% (63)	23.19% (77)	22.59% (75)	26.51% (88)
DVD/Blu-ray	74.70% (248)	21.69% (72)	2.71% (9)	0.30% (1)	0.60% (2)
Cinema	62.05% (206)	31.63% (105)	5.72% (19)	0.60% (2)	0% (0)

Table 12 shows the results of this question only for the subset of data of the participants that were included in the experimental part of the study. As can be seen, television and the Internet remain the main ways of accessing audiovisual content and the Internet maintains the lead among those participants who watch more than 7 hours of audiovisual content per week.

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Table 12. Weekly consumption of audiovisual products in terms of time and means of access (main experiment)

	Less than 1 hour	1-3 hours	4-6 hours	7-9 hours	More than 10 hours
Television	26.9% (14)	25% (13)	30.8% (16)	11.5% (6)	5.8% (3)
Internet	1.9% (1)	26.9% (14)	25% (13)	21.2% (11)	25% (13)
DVD/Blu-ray	78.8% (41)	15.4% (8)	5.8% (3)	-	-
Cinema	67.3% (35)	32.7% (17)	-	-	-

5.1.3. Audiovisual translation modalities

The questionnaire asked the participants about their consumption of translated audiovisual material over the prior six months. As shown in Table 13, 66% of the respondents say they use dubbing very frequently or always, which concords with the general dominance of this translation mode in Spain. Nevertheless, 33% percent of the respondents indicated they use subtitling occasionally, while 36% said they use it very frequently or always. Voice-over is less used, although 40% of the participants said they use it occasionally (23%), very frequently (17%), or always (1%). Given that voice-over is characteristic of documentaries and reality shows, this might also offer information about the type of material being watched. Closed captioning ranked in the last position, as would be expected since it is primarily targeted to deaf and hard-of-hearing people. The results of this question for the group of participants in the experimental stage are shown in Table 14.

Table 13. Use of audiovisual translation modalities for the pre-experiment questionnaire

	Never	Rarely	Occasionally	Very frequently	Always
Voice-over	18.07% (60)	40.66% (135)	23.19% (77)	17.17% (57)	0.90% (3)
Dubbing	3.92% (13)	12.35% (41)	17.77% (59)	46.08% (153)	19.88% (66)
Subtitling	5.72% (19)	25% (83)	33.13% (110)	30.12% (100)	6.02% (20)
Closed caption	57.53% (191)	25.60% (85)	12.05% (40)	4.52% (15)	0.30% (1)

Table 14. Use of audiovisual translation modalities for the main experiment

	Never	Rarely	Occasionally	Very frequently	Always
Voice-over	21.2% (11)	30.8% (16)	23.1% (12)	25% (13)	0
Dubbing	5.8% (3)	15.4% (8)	17.3% (9)	53.8% (28)	7.7% (4)
Subtitling	9.6% (5)	13.5% (7)	42.3% (22)	30.8% (16)	3.8% (2)
Closed caption	69.2% (36)	19.2% (10)	9.6% (5)	1.9% (1)	0

5.1.4. Use of the Internet

Participants were asked about their daily use of the Internet. The *use* of Internet in this case refers to all activities that are performed on the net: e-mail, searches, social networking, watching videos, listening to music, etc. Table 15 shows the answers to this question for the participants who answered the pre-experiment questionnaire and the subset of those who were selected for the second stage of the study. The results show that about 35% of the participants spend between three and four hours using the Internet on a daily basis, about 21% of them use the Internet for one or two hours a day, and nearly one fourth access the Internet for five to six hours a day. A reduced group, 15.6% in the case of the whole sample and 17% of the participants in the experiment stage, are on the Internet for more than 7 hours per day.

Table 15. Use of the Internet per day for participants in the pre-experiment questionnaire and the main experiment

Use of Internet per day	Pre-experiment	Main experiment
Less than 1 hour	3.3% (11)	1.9% (1)
1-2 hours	21.9% (73)	21.2% (11)
3-4 hours	35.2% (117)	34.6% (18)
5-6 hours	23.7% (79)	25% (13)
More than 7 hours	15.6% (52)	17.3% (9)

5.2. Experiment data exploration

As explained in Section 4.2.1, this study was carried out in two stages: a first general questionnaire about media consumption habits, and a second experimental stage. The second stage included a subsample of the questionnaire respondents who were invited to take part in an eye-tracking and interview session. In this section I will describe the results of the response variables collected during the eye-tracking session. This information concerns eye-tracking measurements as well as the answers to the experiment questionnaires, variables related to reception capacity and the participants' opinion on enjoyment and subtitle-reading effort. In what follows, I will present these variables filtered according to the levels of L2/L3, types of subtitles, and clips. This section only includes descriptive statistics; the analyses using mixed-effects modeling are included in Section 5.3. I provide only a brief description of the variables. The main effects and interactions in the mixed-effects section will provide more insights into the data.

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5.2.1. Percentage of fixations

Table 16 shows the means for the percentage of fixations (see Section 4.1.3.3) on the image and the subtitle areas of interest depending on the level of L2/L3 and types of subtitles. On average, the participants in the LLE had about 62% of their fixations on the subtitle area. Among participants in the HLE group, only 44% of their fixations, on average, were on the subtitle area.

Table 16. Mean *percentage of fixations* by area of interest, *Level of L2/L3* and *Type of subtitle*

	Subtitle area		Image area	
	Mean	SD	Mean	SD
Low Level of English (LLE)				
NP1	62%	9%	38%	09%
NP2	64%	9%	36%	09%
PRO	61%	10%	39%	10%
High Level of English (HLE)				
NP1	43%	22%	57%	22%
NP2	44%	23%	56%	23%
PRO	46%	20%	54%	20%

The boxplot in Figure 13 gives a graphic representation of the percentages of fixations on both areas of interest for the participants in the LLE and the HLE groups per *Type of subtitle*. It can be seen that the data points for the participants in the HLE group are more disperse, indicating greater variation in the percentages (this is also indicated by the higher standard deviation values in Table 16). On the other hand, apart from some outliers, the percentages for LLE participants are less disperse. This representation hints at differences in behavior within the two groups: while the behavior of participants in the LLE group is more consistent, there is more variation in the behavior of participants in the HLE group since some of them obtain the verbal information from the audio and do not follow the subtitles thoroughly.

Figure 13. *Percentage of fixations* by area of interest, *Level of L2/L3* and *Type of subtitle*
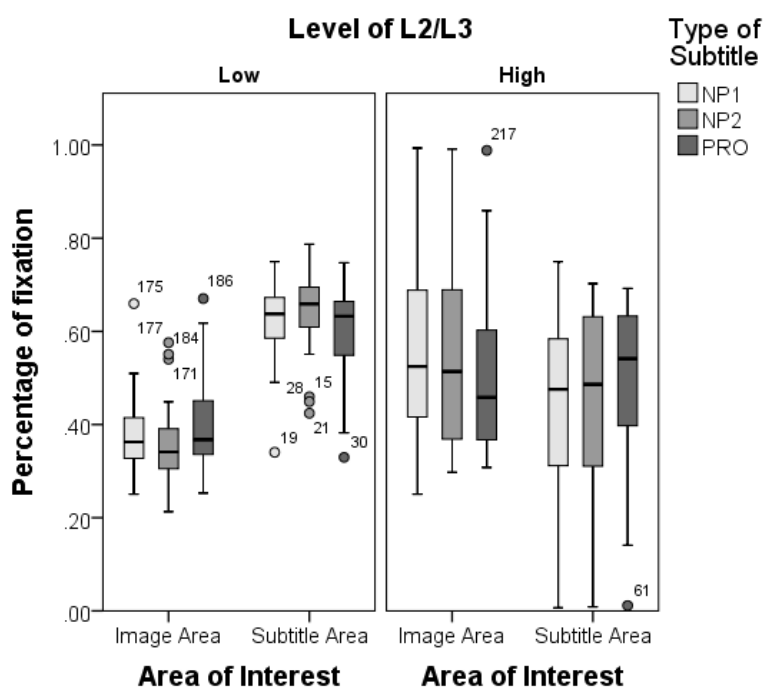
5.2.2. *Percentage of duration of fixations*

The *Percentage of duration of fixations* refers to the percentage of the *Total fixation duration* that the participants spend on a given area of interest. The mean values for the percentages of each group and types of subtitles are shown in Table 17 and the graphical representation of the data is in Figure 14. LLE participants spent about half of the time looking at the subtitle area, while in the case of the participants in the HLE group this value accounts for only 32% of the time.

Table 17. Mean *percentage of duration of fixations* by area of interest, *Level of L2/L3* and *Type of subtitle*

	Subtitle area		Image area	
	Mean	SD	Mean	SD
Low Level of English (LLE)				
NP1	51%	10%	49%	10%
NP2	54%	12%	46%	12%
PRO	51%	12%	49%	12%
High Level of English (HLE)				
NP1	31%	20%	69%	20%
NP2	32%	19%	68%	19%
PRO	33%	18%	67%	18%

Once again, the values for the percentage of duration of fixation seem to suggest differences in the behavior of the participants. The same pattern observed for the percentage of fixations can be observed in the percentage of duration of fixations: a high

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degree of dispersion in the HLE group and a tighter grouping of the data of the LLE group.

Figure 14. *Percentage of duration of fixation* by area of interest, *Level of L2/L3* and *Type of subtitle*
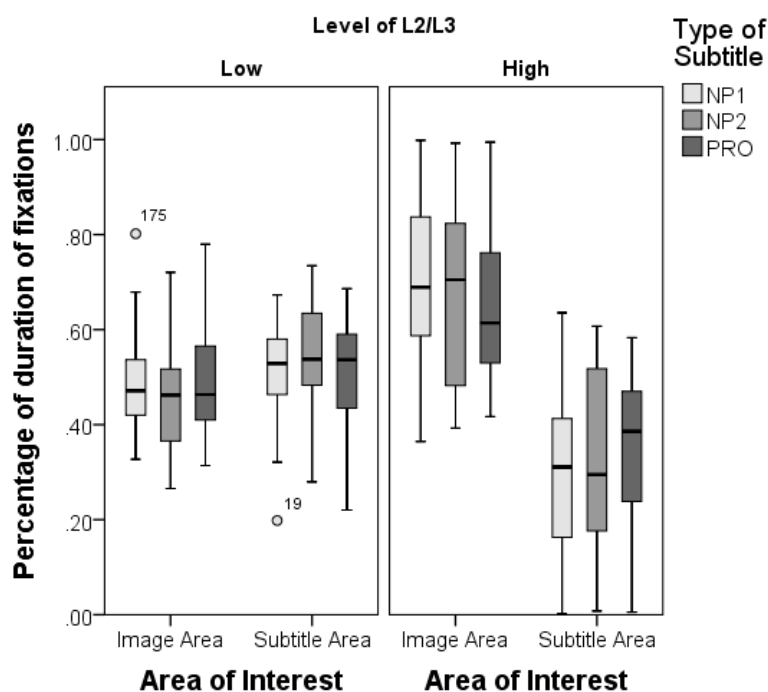
5.2.3. *Mean fixation duration*

Mean fixation duration is commonly used in eye-tracking studies to index cognitive effort: longer and more fixations are considered evidence of more effortful cognitive processing. Although widely accepted, especially in research related to reading studies, this does not mean that it should be taken altogether as a rule. Fixations have also been proven to be task-dependent. As explained in 4.2.7, the nature of the activity (e.g. reading, image perception, visual search) affects the duration of fixations.

Mean fixation durations were calculated independently for the subtitle area and the image area that were drawn onto the screen. Table 18 shows the results of this computation per area of interest as a function of *Type of subtitle* and *Level of L2/L3*. In all cases, mean fixation durations for the subtitle and the image areas in the PRO version of the clips are shorter than the mean fixation durations on the non-professional versions.

The graphic representation (Figure 15) for Mean fixation duration also shows more dispersion in the HLE group. Interestingly, the effect seems to concern the fixation on the images more than the fixations on the subtitles.

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Table 18. *Mean fixation duration* by area of interest, *Level of L2/L3* and *Type of subtitle*

	Subtitle area		Image area	
	Mean fixation	SD	Mean fixation	SD
Low Level of English (LLE)				
NP1	191.09	32.40	405.74	124.39
NP2	209.32	60.82	391.18	90.01
PRO	176.04	32.76	383.96	104.13
High Level of English (HLE)				
NP1	192.22	21.80	306.71	45.66
NP2	195.01	24.43	299.68	43.67
PRO	171.01	22.28	282.79	47.72

Figure 15. *Mean fixation duration* by area of interest, *Level of L2/L3* and *Type of subtitle*
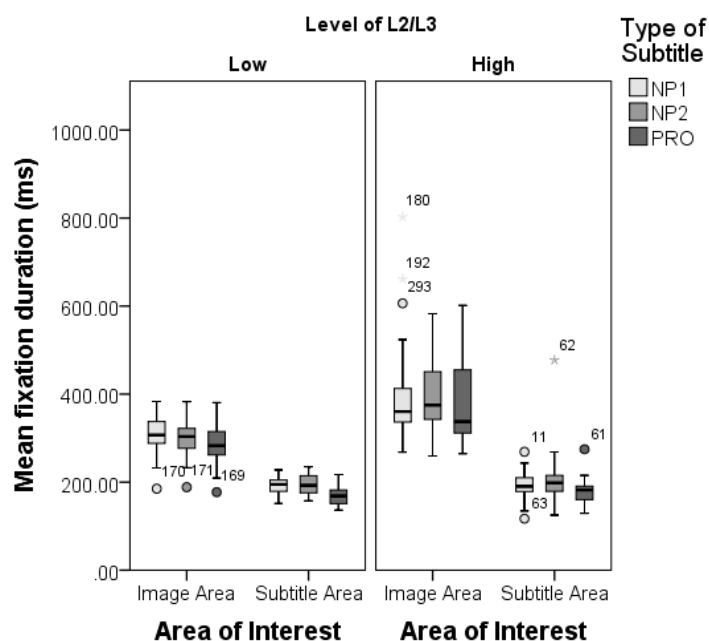
5.2.4. Reception capacity

Reception capacity was measured using a comprehension questionnaire. The questions asked the participants about the verbal, narrative and iconic information in the clips (two questions per each type of attention). There is one additional free-recall question related to gist comprehension. In Section 5.3, the three types of attention are tested independently using generalized mixed models with binomial distribution, while reception capacity, as an overall variable, is tested using a linear mixed model.

As a way to bring together the overall results of these variables, Table 19 presents the percentage of correct answers for each type of attention as well as the percentage of correct answers for reception capacity. In general, the results obtained by the participants with the PRO and the NP1 versions are very similar, with the results for PRO surpassing those of NP1 only in the verbal attention questions. The NP2 version,

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however, has lower results than the other two in all categories. It should be recalled here that NP1 was produced by a Latin-American non-professional subtitling group that aims at creating subtitles in neutral Spanish, while NP2 was made by a Spanish group translating into Iberian Spanish.

Table 19. Percentage of correct answers for different types of attention and *Reception capacity*

	Gist comprehension	Verbal attention	Iconic attention	Narrative attention	Reception capacity
Low Level of English (LLE)					
NP1	81%	87%	75%	77%	80%
NP2	73%	69%	71%	65%	69%
PRO	81%	88%	71%	75%	79%
High Level of English (HLE)					
NP1	96%	85%	75%	79%	82%
NP2	92%	77%	75%	73%	77%
PRO	88%	92%	75%	77%	82%

5.2.5. *Self-reported comprehension*

Table 20 presents the results from the self-reported question that asked participants about their overall comprehension of the clips. The participants were asked to rate their own comprehension of each clip on a scale ranging from 0=*no comprehension* to 5=*very good*. The total average self-reported comprehension ratings per types of subtitles were positive and very similar: 3.69 for PRO, 3.42 for NP1 and 3.73 for NP2 in the LLE group, and 3.96 for PRO, 3.77 for NP1 and 3.73 for NP2 in the HLE group. It should be reminded that Antonini (2008) reports that participants tend to overestimate their comprehension of translated audiovisual content. Results are also presented per clip because, as will be shown in the statistical analysis per variable, the Clip variable was found to have a significant effect on some dependent variables.

Table 20. *Self-reported comprehension* per *Clip, Level of L2/L3* and *Type of subtitle*

	Clip 1		Clip 2		Clip 3		Total average	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Low Level of English (LLE)								
NP1	3.25	1.04	3.67	0.71	3.33	1.00	3.42	0.90
NP2	3.56	0.73	3.63	0.74	4.00	0.71	3.73	0.72
PRO	3.78	0.67	3.56	0.73	3.75	1.16	3.69	0.84
High Level of English (HLE)								
NP1	3.63	0.52	3.56	0.73	4.11	0.93	3.77	0.76
NP2	3.33	0.50	3.63	1.06	4.22	0.67	3.73	0.83
PRO	4.11	0.78	3.89	0.78	3.88	0.64	3.96	0.72

* 0=no comprehension to 5=very high

5.2.6. Subtitle-reading effort

The participants were also asked to give their own opinion about the difficulty of following the subtitles while watching the clips. They were asked to choose a value on a six-point scale from 0=*very difficult* to 5=*very easy*. Total average ratings were also positive and similar in general, the lowest in the HLE group was 3.44 for the NP2, but these subtitles ranked the highest in the LLE group, with 3.69. On the other hand, the highest rated subtitles by the HLE group were the PRO, with 3.76, although these were also the lowest rated by the LLE group (3.5).

Table 21. *Subtitle-reading effort* per *Clip, Level of L2/L3* and *Type of subtitle*

	Clip 1		Clip 2		Clip 3		Total average	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Low Level of English (LLE)								
NP1	3.75	0.89	3.56	1.01	3.44	1.01	3.58	0.95
NP2	3.44	1.13	3.50	0.93	4.11	0.78	3.69	0.97
PRO	3.78	0.67	3.67	0.87	3.00	1.20	3.50	0.95
High Level of English (HLE)								
NP1	3.50	1.07	3.44	0.88	4.25	0.89	3.72	0.98
NP2	3.22	0.97	3.43	1.27	3.67	1.00	3.44	1.04
PRO	4.44	0.73	3.33	1.41	3.50	0.76	3.77	1.11

* 0=very difficult and 5=very easy

5.2.7. Audience enjoyment

After answering the comprehension questions, the participants were asked to assess their enjoyment of each clip. They gave a score from 1 to 4, where 1=*boring* and 4=*great fun*. The average for the results per clip and the total averages are presented in Table 22. A pattern similar to the previous variables also appears here: there is little variation in the values, although the overall values for NP2 are the smallest in both groups: 2.54 for the LLE group and 2.77 for the HLE group. The PRO version scores the highest for HLE, 3.08, while NP1 has the highest score in the LLE group, of 2.58.

Table 22. *Audience enjoyment* per *Clip, Level of L2/L3* and *Type of subtitle*

	Clip 1		Clip 2		Clip 3		Total average	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Low Level of English (LLE)								
NP1	2.63	0.92	2.33	1.00	2.78	0.83	2.58	0.90
NP2	2.11	0.78	2.38	0.92	3.11	0.78	2.54	0.90
PRO	2.11	0.60	2.11	0.78	2.75	0.89	2.31	0.79
High Level of English (HLE)								
NP1	2.75	0.46	2.67	0.50	3.11	0.93	2.85	0.67
NP2	2.44	0.53	3.00	0.53	2.89	0.78	2.77	0.65
PRO	3.00	0.50	2.89	0.78	3.38	0.52	3.08	0.63

* 1=*boring* to 4=*great fun*

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5.3.   Quantitative analysis per variable

The following subsections present the models constructed for each dependent variable in the study. Unless indicated otherwise, during the initial stages different models with different combination of variables were tested in a stepwise manner in order to remove non-significant variables and interactions and to refine the model.

As described above, the process of constructing the models consists of introducing the variables into an initial model and reducing them in a systematic and stepwise process. This process results in a final model that provides the tools to test the hypotheses that were proposed for this dissertation. Section 5.3.1 details the transformations that were necessary to apply two explanatory variables (*Subtitle-reading effort* and *Use of subtitling*) prior to building the final models.

Given the large number of variables included in this study, at the first stage of each test it was deemed appropriate to have multiple runs with slightly different models combining different sets of variables and interactions. The initial models always included the variables that were central to the investigation (*Level of L2/L3*, *Type of subtitle*) and special attention was given to the variables *Clip*, *Prior knowledge of the clips*, *Order of presentation* and *Gender* and their interactions. Table 23 shows all the variables included in the study.

The exploration of interactions was equally important, since a variable may perhaps not have a main effect and still participate in an interaction with a significant effect. In summary, the final model includes those variables and interactions that were found to be significant after the testing stage. Thus, if a variable is not included in the final model, that means it turned out to produce non-significant results. However, in cases in which the variable under investigation is non-significant but its inclusion in the model does not obscure the effects of other significant variables, the variable under investigation is kept in the final model.

Table 23. List of variables with codes and descriptions

	Variable	Code	Explanation/Questions	Levels/measurement
Eye-tracking measurements	Level of L2/L3	L2L3Level	Proficiency in English	High/ Low
	Type of subtitle	Subs	Subtitle version	PRO/NP1/NP2
	Total fixation duration on the subtitle area	SubFixDur	Total duration of fixations on the subtitle area	Milliseconds
	Percentage of fixations on the subtitle area	SubFixCP	Fixations on the subtitle area/total fixations	Percentage
	Percentage of duration of fixations on the subtitle area	SubFixDurP	Duration of fixations on the subtitle area/total fixation duration	Percentage
	Mean fixation duration on the subtitle	SubMeanFix	Mean fixation on the subtitle area	Milliseconds
	Percentage of fixations on the Image area	ImgFixCP	Fixations on the image area/total fixations	Percentage
	Percentage of duration of fixations on the subtitle area	ImgFixDurP	Duration of fixations on the image area/total fixation duration	Percentage
	Mean fixation duration on the image	ImgMeanFix	Mean fixation on the image area	Milliseconds
	Skipped subtitles	PSkipSubs	Unfixated subtitles/number of subtitles per clip	Percentage
	Attention shift ratio	Shifts	Number of shifts/total number of subtitles per clip	Ratio
Self-assessment	Subtitle-reading effort	Trans_Read_Effort	Participants' ratings for difficulty to follow the subtitles.	6 levels: 0=very difficult/5=very easy
	Self-reported comprehension	SRCompre	Self-reported comprehension	6 levels: 0=none/5=very good
	Audience enjoyment	Enjoyment	Participants' ratings for their amusement with each clip	4 levels: 1=boring/4=great fun
Recall	Reception capacity	AllAtten	Results from comprehension testing: seven questions	8 levels
	Narrative attention	NarrAtte	Narrative attention testing	3 levels (2 questions each)
	Iconic attention	IconAtte	Iconic attention testing	
	Verbal attention	VerbAtte	Verbal attention testing	
Control	Clip	Clip	Excerpt from the TV series and position in the input	3 levels
	Order of presentation	TestOrder	Order of administration of the subtitle conditions	6 levels
	Prior knowledge of the clips	Watched	Knowledge of the specific segment	Yes/No
Pre-experiment	Gender	Gender		Woman/Man
	Use of Television	Television	Use of television	Less than 1 hour 1-3 hours 4-6 hours 7-9 hours More than 10 hours
	Use of Internet	Internet	Use of Internet to access audiovisual material	
	Use of DVD	DVD	Use of DVD/Blu-Ray	
	Use of Cinema	Cinema	Use of cinema	
	Use of voiceover	Voiceover	Use of voiceover	Never Rarely Occasionally Very frequently/ Always
	Use of dubbing	Dubbing	Use of dubbing	
	Use of subtitling	Subtitling	*Use of subtitling*	
	Use of closed caption	Ccaption	Use of closed caption	
	Daily use of Internet	InternetD	Use of Internet per day	Less than 1 hour 1-2 hours 3-4 hours 5-6 hours More than 7 hours

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5.3.1. Preparation of variables for statistical analysis

The different trials with the models before reaching the final adjusted model are helpful because they allow the researcher to become familiar with the variables and to produce more educated guesses about the possible main effects and interactions that could be found in the collected data. The process of variable selection helps define the general panorama of the data.

After some initial trials with the model, it was possible to posit that the variables *Subtitle-reading effort* and *Use of subtitling* could have significant effects on some of the dependent variables, however their uneven initial distribution (with one level with very few observations in each case) was posing problems and causing the models to be unstable. Once the problem was detected, I considered two ways of dealing with it: the data points could be removed from the data set, or the variables could be analyzed and transformed so that the levels with few data points would not affect the model. In the following paragraphs I explain how the variables were transformed before constructing the statistical models.

5.3.1.1. Use of subtitling

The variable *Use of subtitling* reports on the participants' consumption of subtitles material over the six months prior to the experiment. The participants were offered five options to answer, ranging from *Never* to *Always*. The category *Always* was selected by two participants only (3.8% of the entire sample) and was very small in comparison to the other categories. In the preliminary tests, the results from these participants did not differ significantly from those obtained by participants in the immediately previous category, *Very frequently*. Hence, after discussing the possibilities with the statistics consultant, he suggested transforming the variable and combining the two levels: *Very frequently* and *Always*. Figure 16 shows the initial distribution of the variable, with five groups, and the resulting transformed variable, with four groups.

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Figure 16. *Use of subtitling*, original and transformed
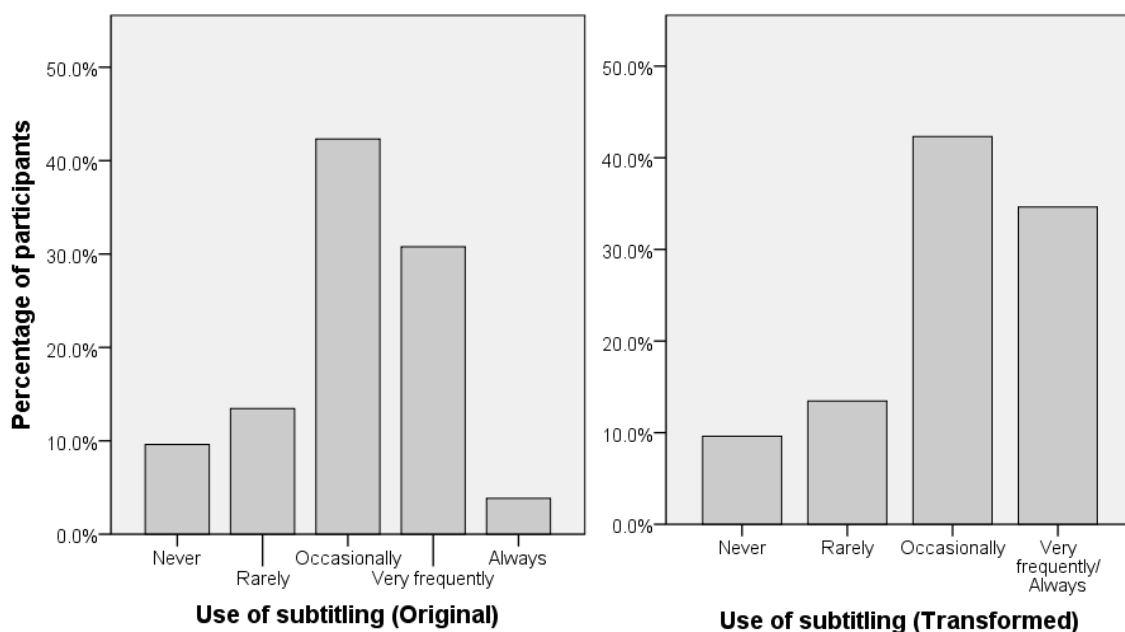
5.3.1.2. Subtitle-reading effort

As in the previous case, the solution for *Subtitle-reading effort* was to regroup the values by adding the smallest category to the closest neighboring category. The values for *Subtitle-reading effort* were obtained using a scale ranging from 0=*very difficult* to 5=*very easy to follow*. In the case of *Subtitle-reading effort*, the level that was causing disturbance in the model was level 1. Nobody in the experiment selected zero as an answer to this question and only one participant (1.9%) selected 1. Again, there were no significant differences between this participant's answers and those obtained by the participants who gave 2 as an answer to the question. Thus, the variable was transformed and the value 1 was changed to 2, creating a new category. The initial distribution of the variable as well as the transformed variable, with four levels, are shown in Figure 17.

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Figure 17. *Subtitle-reading effort*, original and transformed
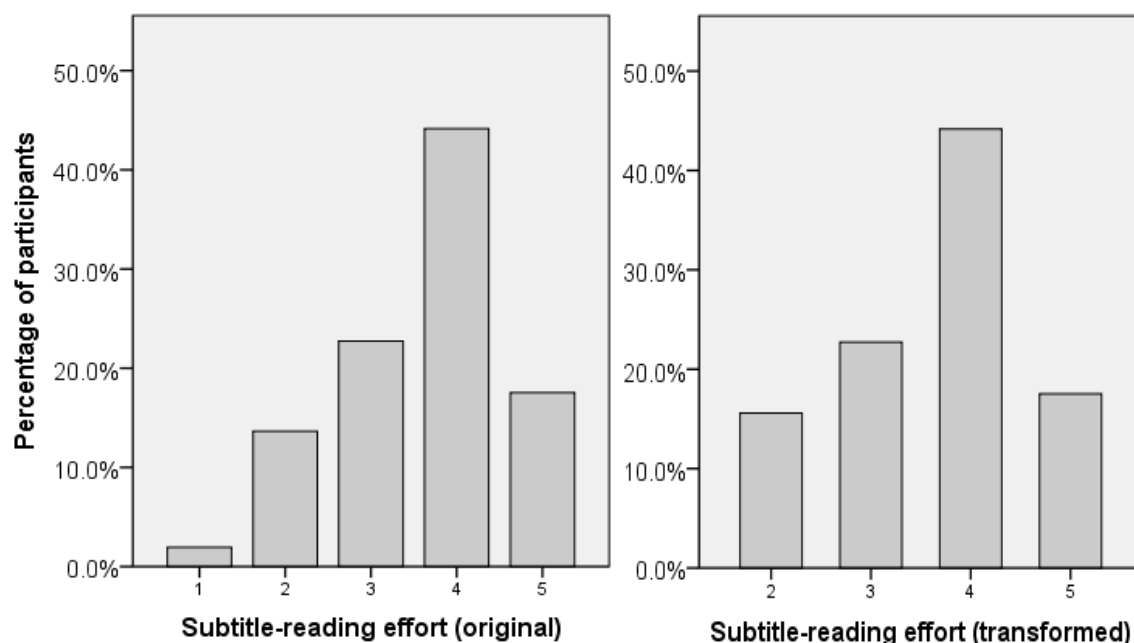
5.3.2. Attention allocation

This section will report on the analyses carried out to explore the variables related to attention allocation. Attention allocation was measured using eye tracking. This variable is actually composed of different variables reporting the results of different eye-tracking measurements. First I will present the model used for exploring *Total fixation duration on the subtitle area*. Then I will deal with *Percentage of fixations on the subtitle area*. Lastly I will illustrate how *Percentage of fixations on the subtitle area* is correlated to the remaining attention allocation variables, namely *Percentage of duration of fixations on the subtitle area* and *Percentage of fixations on the image area*. Since these variables are comparable, the adjusted model for *Percentage of fixations on the subtitle area* is also fit for analyzing the other variables and produces similar results. Taking this into consideration, only the results of *Percentage of fixations on the subtitle area* are explained in detail here.

For analyzing cognitive effort, the fixations on the subtitles are explored under the assumption that "the longer the fixation time […], the greater the cognitive effort" (Saldanha and O'Brien 2013:144). This assumption does not apply for fixations on the image area, since eye movements differ depending on the type of activity people perform (reading text vs. watching a moving picture).

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5.3.2.1. Total fixation duration on the subtitle area

The *Total fixation duration* reports the total time during the recording that participants spent looking at the subtitle area. Different initial models were tested with variations in the combinations of the variables. The models included *Total fixation duration on the subtitle area* as target, and the control variables for *Prior knowledge of the clips*, *Order of presentation* and *Gender*, as well as the *Clip* variable, were included as independent variables. Each time, these variables were combined with others to test the model and start removing those that did not have a significant effect on the dependent variable, in this case, *Total fixation duration on the subtitle area*. Given the different lengths of the clips, it was expected that this variable would have a significant effect on *Total fixation duration on the subtitle area*. Nevertheless, in the process of adjusting the model, this variable was not found to have a significant effect. *Clip* is thus not included in the final model because, although it is a non-significant variable, when it was included in the model it obscured the effects of the significant variables. This case is commented by Balling (2008:186) in her discussion of mixed-effects modelling and she recommends constructing the model with the significant variables only. Unless otherwise explained, this rationale was used for constructing all the models included in this dissertation. The main effect of *Use of subtitling* (F=7.81; p<0.001) and *Level of L2/L3* (F=13.09; p<0.0001) are significant, as is the interaction between these two variables (F=5.60; p<0.01).

Use of subtitling

The estimated marginal means for the significant effect of *Use of subtitling* on *Total fixation duration on the subtitle area* (F=7.81; p<0.001) are presented in Table 24.

Table 24. Estimated marginal means of *Total fixation duration on the subtitle area* (ms) with the effect of *Use of subtitling*

Use of subtitling	Mean	Std. Error
Never	32339.50	7685.69
Rarely	91424.39	6275.34
Occasionally	70766.12	3406.32
Very frequently/Always	72726.26	3703.06

Figure 18 shows a graphical representation of the variable *Use of subtitling* per *Level of L2/L3*. A quick inspection of this graph indicates that only the participants in the HLE group declared they *never* use subtitles. This explains the significant differences shown in Table 25 between the participants who declared they never use

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subtitles and the participants who selected the other categories (in all cases, p<0.05). There is yet another significant difference between the participants who *rarely* use subtitling and those who do it *occasionally* (t=2.89; p<0.01) and also between the participants who *rarely* use subtitles and the ones who use them *very frequently or always* (t=2.57; p<0.05). No significant difference was found between the other two groups, which are the biggest groups in the sample and include the participants who use subtitles *occasionally* and *very frequently/always*.

Table 25. Pairwise contrast of estimated marginal means of *Total duration of fixations on the subtitle area* (ms) with the effect of *Use of subtitling*

Use of subtitling	Mean difference	Std. Error	t	df	p-value
Never - Rarely	-59084.89	9922.18	-5.95	141	<0.0001*
Never - Occasionally	-38426.62	8406.71	-4.57	141	0.010*
Never - Very frequently/Always	-40386.76	8531.26	-4.73	141	0.005*
Rarely - Occasionally	20658.26	7140.23	2.89	141	0.004*
Rarely - Very frequently/Always	18698.13	7286.46	2.57	141	0.011*
Occasionally - Very frequently/Always	-1960.13	5031.47	-0.39	141	0.697

* indicates significant results (α=0.05)

Figure 18. *Use of subtitling* per *Level of L2/L3*
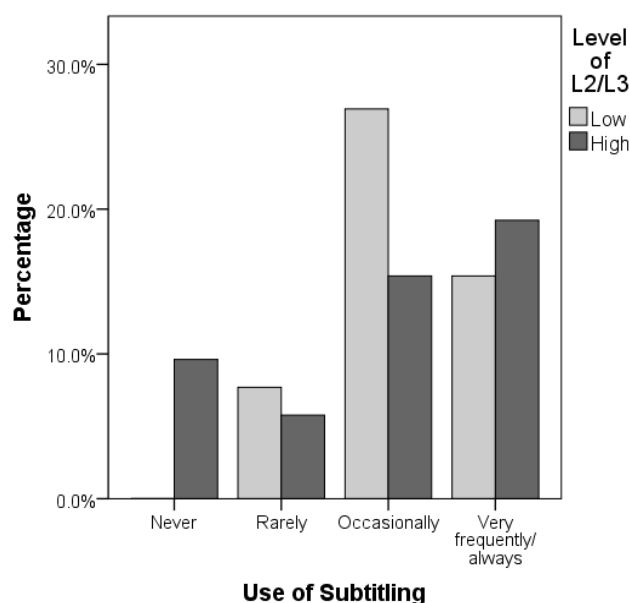
Level of L2/L3

The level of proficiency in English was found to have a significant effect on *Total duration of fixations on the subtitle area* (F=13.09; p<0.0001). Table 26 shows the estimated means for each level of the variable. The difference between the two estimated means is 28469.74 ms (t=5.59, p<0.001). The result indicates that participants

in the LLE group spent over 28400 ms more looking at the subtitle area than the participants in the HLE group.

Table 26. Estimated marginal means of *Total fixation duration on the subtitle area* (ms) with the effect of *Level of L2/L3*

Level of L2/L3	Mean	Std. Error
Low	88007.43	3729.34
High	59537.69	3470.23

Level of L2/L3 and Use of subtitling

The interaction between *Level of L2/L3* and *Use of subtitling on Total duration of fixations on the subtitle area* had a significant effect (F=5.60; p<0.01). The estimated means calculated for the combination of the two variables are presented in Table 27. It can be seen that the means for the HLE group are smaller in all cases except in those participants with a High level of English who declared they *rarely* use subtitles.

Table 27. Estimated marginal means of *Total duration of fixations on the subtitle area* (ms) with the interaction effect between *Level of L2/L3* and *Use of subtitling*.

Level of L2/L3	Use of subtitling	Mean	Std. Error
High	Never	32339.50	7685.69
	Rarely	95162.44	8874.67
	Occasionally	50754.42	5434.60
	Very frequently/Always	59894.39	5031.47
Low	Rarely	87686.33	8874.67
	Occasionally	90777.83	4108.17
	Very frequently/Always	85558.12	5434.60

The comparison of the estimated means for the interaction is presented in Table 28, considering *Level of L2/L3* as reference factor, and the graphical representation is shown in Figure 19. No significant difference was found in *Total fixation duration* among the participants in the LLE group and the HLE group that said they *rarely* use subtitles. Finally, there is a significant 40023 ms difference between the two groups of participants between those who use subtitles *occasionally* (t=5.87; p<0.001) and a difference of 25664 ms between the participants in the HLE group and the LLE group who use subtitles *very frequently/always* (t=3.46; p<0.05). These results concord with what one might expect, since they indicate that participants with a HLE who are more used to reading subtitles spent less time reading them than the participants who are used to reading them but are in the LLE group. The findings also show that HLE participants who never use subtitles relied on them very little and were able to skip them most of the time, since they are the group that spent the least time on this area.

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Figure 19. Estimated marginal means of *Total duration of fixations on the subtitle area* (ms) with the interaction effect between *Level of L2/L3* and *Use of subtitling*
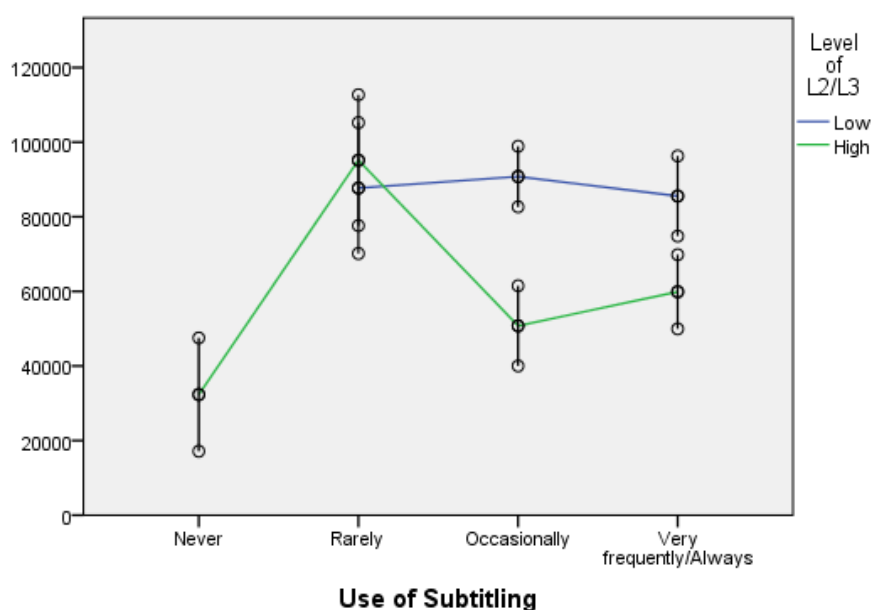
Table 28. Pairwise contrasts of estimated marginal means of *Total duration of fixations on the subtitle area* (ms) with the interaction effect between *Level of L2/L3* and *Use of subtitling*

Level of L2/L3	Use of subtitling	Mean difference	Std. Error	t	df	p-value
Low - High	Rarely	-7476.11	12550.68	-0.10	141	0.552
	Occasionally	40023.42	6812.64	5.87	141	0.0001*
	Very frequently/Always	25663.73	7406.12	3.46	141	0.001*

* indicates significant results ($\alpha=0.05$)

5.3.2.2. Percentage of fixations on the subtitle area

The *Percentage of fixations on the subtitle area* is calculated as the ratio of the number of fixations on the subtitle area over the total number of fixations (subtitled area plus image area). Using *Percentage of fixations on the subtitle area* as target in the model, all the other factors are tested as independent variables. The final model for *Percentage of fixations on the subtitle area* found a significant effect for the variables *Level of L2/L3* (F=12.23; p<0.01), *Clip* (F=14.16; p<0.001), *Use of subtitling* (F=4.69; p<0.01) and of the interaction between *Level of L2/L3* and *Prior knowledge of the clips* (F=5.11, p<0.05). *Type of subtitle* did not yield significant results (F=0.95; p=3.90).

Level of L2/L3

The means resulting from the significant effect of *Level of L2/L3* on *Percentage of fixations on the subtitle area* (F=12.23; p<0.01) are presented in Table 29. As can be seen, there is a 0.16 difference between the LLE group and the HLE group (t=3.50; p<0.05). This indicated that there is a 15.7% difference in the percentage of fixations that participants with a low level of English and participants with a high level of

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proficiency in English made while looking at the subtitle area. For participants in the LLE group, this means that 59% of all the fixations during the screening time were made within the subtitle area.

Table 29. Estimated marginal means of *Percentage of fixations* with the effect of *Level of L2/L3*

Level of L2/L3	Mean	Std. Error
Low	.590	.039
High	.433	.031

Clip

The *Clip* variable was found to have a significant effect on the *Percentage of fixations on the subtitle area* (F=14.16; p<0.001), the means are presented in Table 30 and the graphical representation is shown in Figure 20. The comparisons of the estimated means are included in Table 31. While there is no significant difference between the estimated means for Clip 1 and Clip 3 (t=1.56; p=121), when participants were watching Clip 2, *Percentage of fixations on the subtitle area* was 5.8 points higher than when they were watching Clip 1 (t=5.17; p<0.001). *Percentage of fixations on the subtitle area* was also 4 points higher when they were watching Clip 2 than when they were watching Clip 3 (t=3.62; p<0.001).

Table 30. Estimated marginal means of *Percentage of fixations on the subtitle area* with the effect of *Clip*

Clip	Mean	Std. Error
Clip 1	.486	.028
Clip 2	.544	.028
Clip 3	.504	.028

Figure 20. Estimated marginal means of *Percentage of fixations on the subtitle area* with the effect of *Clip*

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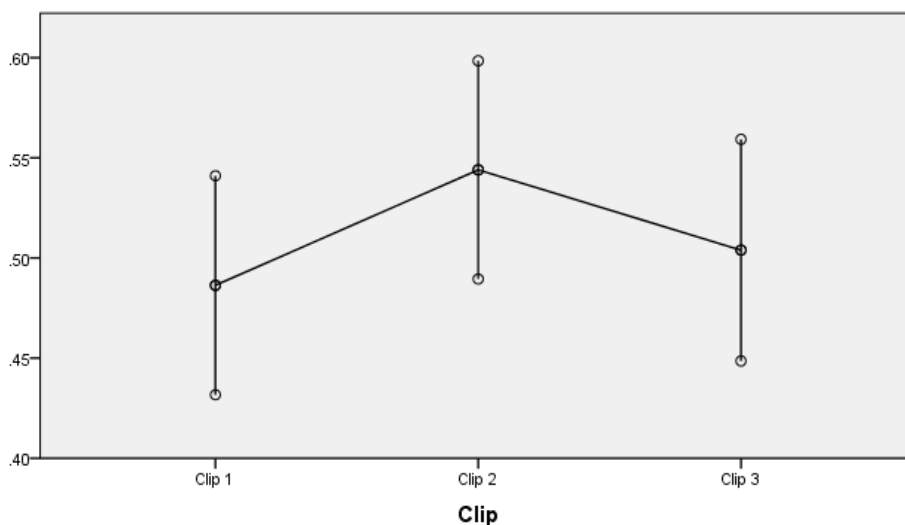
Table 31. Pairwise contrasts of estimated marginal means of *Percentage fixations on the subtitle area* with the effect of *Clip*

Clips	Mean difference	Std. Error	t	df	p-value
Clip 1 - Clip 2	-.058	.011	-5.17	137	0.000*
Clip 2 - Clip 3	.040	.011	3.62	137	0.000*
Clip 3 - Clip 1	.018	.011	1.56	137	0.121

* indicates significant results (α=0.05)

As will be discussed later, the intention of the design was to have video excerpts that would not differ greatly. Nevertheless the nature of the audiovisual material and the focus on maintaining an ecologically valid design come with necessary costs such as this one. The effect of *Clip* in the variables altogether will be addressed in Section 6.2.3.

Use of subtitling

The variable *Use of subtitling* was determined to have a significant effect on *Percentage of fixations on the subtitle area* (F=4.69; p<0.01). Table 32 shows the estimated means for the four levels of the variable, while the pairwise contrasts are presented in Table 33.

Table 32. Estimated marginal means of *Percentage of fixations on the subtitle area* with the effect of *Use of subtitling*

Use of subtitling	Mean	Std. Error
Never	.306	.074
Rarely	.651	.059
Occasionally	.533	.032
Very frequently/Always	.555	.034

A close analysis of Table 33 comparing the estimated means shows the level *Never* has significant differences with respect to all the other levels (p<0.01). Referring to Figure 18, only participants in the HLE group say they *never* use subtitles when watching audiovisual material. This indicates that participants who declare to *never* use subtitles are also the ones who fixated the least frequently on the subtitle area. These results show that these participants in the *Never* group made about 31% of their fixations on the subtitle area. The differences between this value and the percentage of fixations for participants in all other groups range between 22 and 35 points.

Table 33. Pairwise contrasts of estimated marginal means of *Percentage of fixations on the subtitle area* with the effect of *Use of subtitling*

Use of subtitling	Mean difference	Std. Error	t	df	p-value
Never - Rarely	-.345	.094	-3.67	137	0.000*
Never - Occasionally	-.227	.082	-2.78	137	0.006*
Never - Very frequently/Always	-.249	.081	-3.08	137	0.002*
Rarely - Occasionally	.118	.066	1.80	137	0.075
Rarely - Very frequently/Always	.096	.067	1.43	137	0.154
Occasionally - Very frequently/Always	-.022	.046	-0.47	137	0.640

* indicates significant results (α=0.05)

Figure 21. Estimated marginal means of *Percentage of fixations* with the effect of *Use of subtitling*
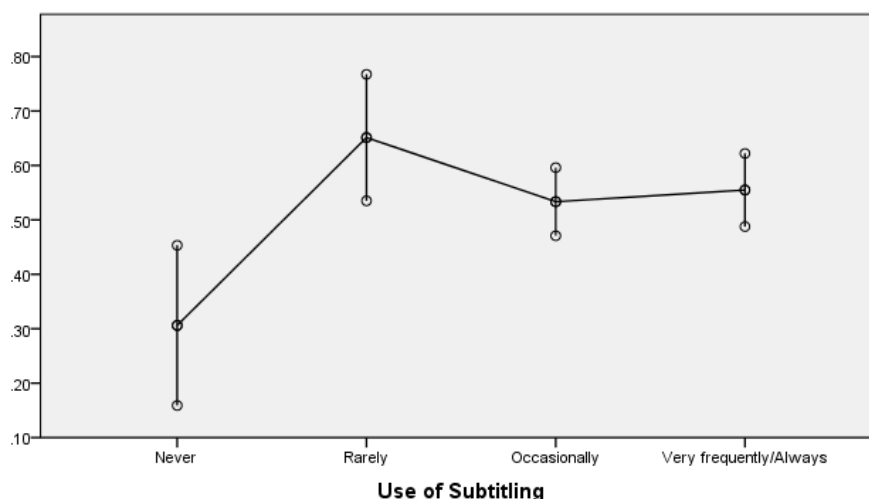
Level of L2/L3 and Prior knowledge of the clips

The results indicate a significant interaction effect between *Level of L2/L3* and *Prior knowledge of the clips* on *Percentage of fixations on the subtitle area* (F=5.11, p<0.05). Table 34 shows the mean percentage of fixations on the subtitle area for the two groups, depending on *Prior knowledge of the clip*s. In the LLE group, the participants who had seen the clip before made more fixations on the subtitle area, while the case is reversed among the participants in the HLE group.

Table 34. Estimated marginal means of *Percentage of fixations on the subtitle area* with the interaction effect between *Level of L2/L3* and *Prior knowledge of the clips*

Level of L2/L3	Watched	Mean	Std. Error
Low	Yes	.605	.049
	No	.575	.037
High	Yes	.395	.036
	No	.471	.033

The comparison between the levels of the variable is shown in Table 35, taking *Prior knowledge of the clips* as reference factor. There is a significant difference (t=-2.53; p<0.05) in the HLE group, which indicates that participants who said they had seen the clip before made fewer fixations on the subtitle area. No significant difference was found in the LLE group (t=81; p=0.418).

Table 35. Pairwise contrasts of estimated marginal means of *Percentage of fixations on the subtitle area* with the interaction effect between *Level of L2/L3* and *Prior knowledge of the clips*

Watched	Level of L2/L3	Mean difference	Std. Error	t	df	p-value
Yes - No	Low	.030	.037	0.813	137	0.418
	High	-.076	.030	-2.53	137	0.012*

* indicates significant results (α=0.05)

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Figure 22. Estimated marginal means of *Percentage of fixations on the subtitle area* with the interaction effect between *Level of L2/L3* and *Prior knowledge of the clips*
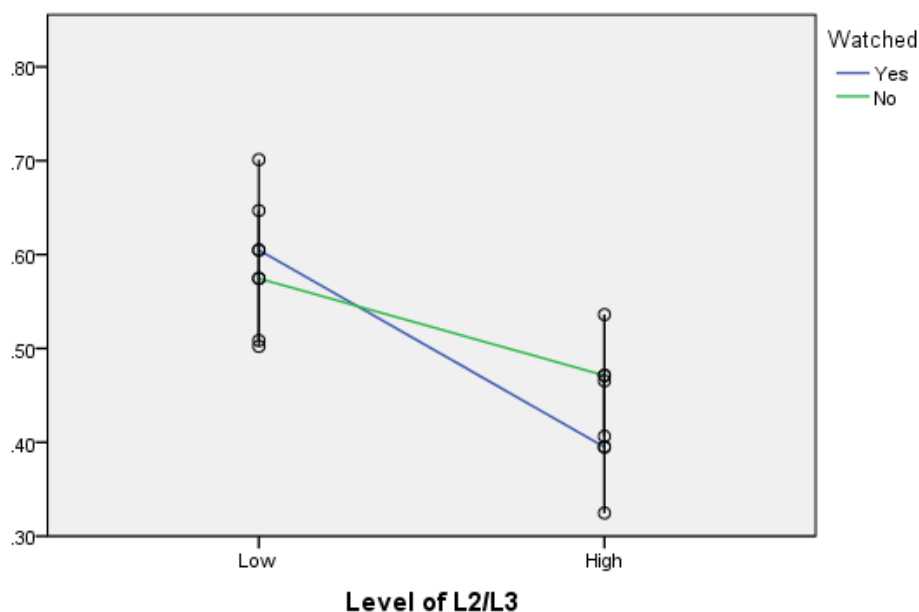
5.3.2.3. Other attention-allocation variables

Attention allocation is assessed in different ways depending on the measurement and the area of interest. I used the percentage of fixations and the percentage of the duration of fixations as standardization methods for running the analysis, considering the different lengths of the video excerpts. This means that each variable for the subtitle area of interest is complementary to its corresponding equivalent for the image area. Given the high correlation between the variables, running independent analyses for each one would yield the same or very similar results and including those analyses in the dissertation would be redundant. For this reason, the analysis presented above offers the results for *Percentage of fixations on the subtitle area* and not the results of the model for the variable *Percentage of fixations on the image area*.

As shown in Table 36, when the model constructed for *Percentage of fixations on the subtitle area* is applied to test *Percentage of fixations on the image area* as target, it produces the same results. The model includes significant effects of the variables *Level of L2/L3* (F=12.23; p<0.01), *Clip* (F=14.16; p<0.001), *Use of subtitling* (F=4.69; p<0.01) and of the interaction between *Level of L2/L3* and *Prior knowledge of the clips* (F=5.11, p<0.05), and non-significant results for the *Type of subtitle* variable (F=0.95; p=3.90).

Table 36. Final model of *Percentage of fixations on the subtitle area* applied to *Percentage of fixations on the image area*, with the same main effects and interactions

Predictor	F	Numerator df	Denominator df	p-value
L2L3Level	12.23	1	137	0.001*
Subs	0.95	2	137	0.390
Clip	14.16	2	137	<0.0001*
Subtitling	4.69	3	137	0.004*
Watched	0.89	1	137	0.345
L2L3Level * Watched	5.11	1	137	0.025*

* indicates significant results (α=0.05)

Regarding the variables related to the Percentage of duration of fixations on each area, I expected that the analysis could provide results different from the model for percentage of fixations, as observed in the pilot study for the experiment (Section 4.7.3). The pilot study showed the LLE participants had a higher percentage of fixations on the subtitle area than on the image area, but the percentage of the *duration* of fixations was higher for the image area. However, this was not the case in the main experiment, where LLE participants had both a higher percentage in the *number* of fixations and in the *duration* of fixations on the subtitle area (see Figure 13 and Figure 14). *Percentage of fixations on the subtitle area* and *Percentage of duration of fixations on the subtitle area* were highly correlated (r=0.96; p<0.001). A graphical representation of these variables can be seen in Figure 23.

Figure 23. *Percentage of duration of fixations* and *Percentage of fixations on the subtitle area*
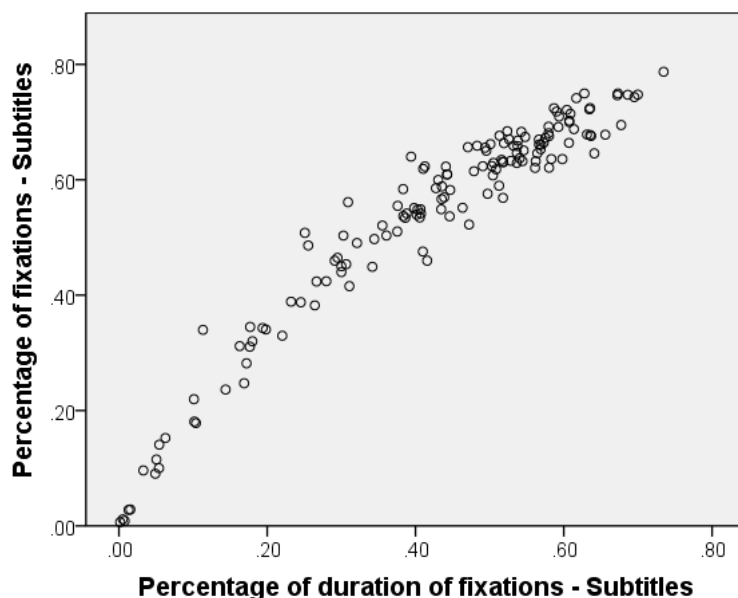
This high correlation indicated that the statistical analysis of *Percentage of duration of fixations on the subtitle area* would yield results similar to those obtained

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with the model of *Percentage of fixations on the subtitle area*. Table 37 presents the final model of *Percentage of fixations on the subtitle area* applied to *Percentage of duration of fixations on the subtitle area* as target variable. The same significant effects were found as in the other variable: on *Level of L2/L3* (F=19.41; p<0.001), *Clip* (F=23.13; p<0.001), *Use of subtitling* (F=3.03; p<0.05), the interaction between *Level of L2/L3* and *Prior knowledge of the clips* (F=5.61, p<0.05). Again, the model yields non-significant results for *Type of subtitle* (F=2.20; p=0.115). With relation to *Level of L2/L3,* HLE participants spent 31% of the time on the subtitle area on average, while this average percentage is 50% for LLE participants.

Table 37. Final model of *Percentage of fixations on the subtitle area* applied to *Percentage of duration of fixations on the subtitle area*, with the same main effects and interactions

Predictor	F	Numerator df	Denominator df	p-value
L2L3Level	19.41	1	137	<0.001*
Subs	2.20	2	137	0.115
Clip	23.13	2	137	<0.001*
Subtitling	3.03	3	137	0.031*
Watched	0.54	1	137	0.463
L2L3Level * Watched	5.61	1	137	0.019*

* indicates significant results (α=0.05)

5.3.2.4. Attention allocation - Summary

Here is a list of the conclusions that can be drawn from the analysis for *Attention allocation*:

- HLE participants who never use subtitles fixated the least on the subtitle area. Only 31% of their fixations were made on the subtitle area.
- The *Type of subtitle* does not have an effect on the participant's attention allocation.
- The *Total fixation duration on the subtitle area* seems to confirm that LLE participants have a more homogeneous behavior, regardless of their use of subtitles, while HLE participants have a higher degree of variation in their behavior. Clip 2 was the object of the greatest cognitive effort. The participants made significantly more fixations on the subtitles in Clip 2 than on the subtitles in the other two clips.
- The participants in the HLE group made 43% of the fixations on the subtitle area, while this average reached 59% among the participants in the LLE group. Likewise, they spent 32% and 51% of the time on the subtitle area respectively.

- It would have been expected that all participants who had already seen the clip would fixate less on the subtitles. While this is the case for HLE, the results are counterintuitive for LLE. HLE participants who had seen the clip before made fewer fixations on the subtitle area and this difference is statistically significant. On the other hand, LLE participants made *more* fixations on the subtitle area, although this difference is not at a significant level.

5.3.3. Skipped subtitles

Skipped subtitles are calculated as the percentage of unfixated subtitles for each clip. The main effects of *Level of L2/L3* (F=11.66; p<0.01), *Order of presentation* (F=3.02; p<0.05) and *Use of subtitling* (F=3.11; p<0.05) were included in the final adjusted model. *Type of subtitle* is also included in the model for *Skipped subtitles*, even though it had a non-significant effect (F=2.49; p=0.087). It was kept as part of the model in order to show its effect and because its inclusion did not obscure the effects of the significant variables.

5.3.3.1. Level of L2/L3

Level of L2/L3 has a significant effect on the percentage of *Skipped subtitles*, according to the model (F=11.66; p<0.01). Table 38 shows the estimated means for the two groups of proficiency in English in the study. While participants in the LLE group skip about 7% of the subtitles on screen, HLE participants skip about one fourth of the subtitles. Thus, there is a 17.9-point difference between the subtitles skipped by HLE participants and those skipped by the in the LLE group (t=3.41, p<0.05).

Table 38. Estimated marginal means of *Skipped subtitles* with the effect of *Level of L2/L3*

Level of L2/L3	Mean	Std. Error
Low	.073	.046
High	.252	.038

5.3.3.2. Order of presentation

The *Order of presentation* was not expected to have a significant effect on the variables. As explained above, the subtitles were randomized and participants were also randomly assigned to one of the six orders of presentation. Nevertheless, the model for *Skipped subtitles* found the order of presentation had a significant effect (F=3.02; p<0.05). The estimated means for each level of the variable are presented in Table 39. It can be easily

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seen that the estimated mean of the *Order of presentation 5* is higher than the means for the other orders. The estimated mean of order 2 is also high, although not as high as that of order 5.

Table 39. Estimated marginal means of *Skipped subtitles* with the effect of order of presentation

Order of presentation	Mean	Std. Error
1	.116	.066
2	.240	.059
3	.060	.067
4	.103	.071
5	.351	.070
6	.102	.068

Figure 24. *Skipped subtitle* (%) per *Order of presentation* and *Level of L2/L3*
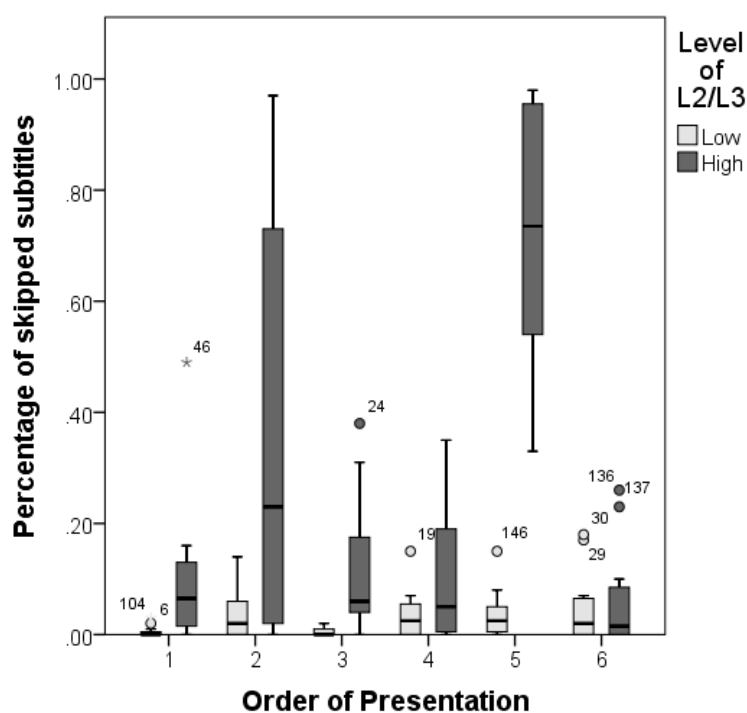
A detailed revision of the pairwise contrasts of the means in Table 40 and Figure 25 confirms that there is a significant difference between the *Order of presentation 5* and all other orders of presentation ($p < 0.05$ in all cases). As can be seen in Figure 24, two extreme conditions coincided by chance in the order of presentation 5: those participants in the LLE who dedicated a large percentage of the time to reading the subtitles, and the HLE participants who dedicated the least time to the subtitle area. In the order of presentation, there is also high dispersion among participants in the HLE group, while the values in the LLE group are closer together. Due to the interesting differences in these behaviors, this topic will be addressed independently in Section 6.2.1.

Table 40. Pairwise contrasts of estimated marginal means of *Skipped subtitles* with the effect of *Order of presentation*

Order of presentation	Mean difference	Std. Error	t	df	p-value
1 - 2	-.124	.084	-1.47	136	0.142
1 - 3	.056	.090	0.62	136	0.536
1 - 4	.013	.090	0.14	136	0.886
1 - 5	-.235	.096	-2.45	136	0.016*
1 - 6	.015	.087	0.17	136	0.867
2 - 3	.180	.088	2.04	136	0.043*
2 - 4	.137	.090	1.53	136	0.129
2 - 5	-.111	.095	-1.16	136	0.247
2 - 6	.139	.085	1.63	136	0.105
3 - 4	-.043	.088	-0.49	136	0.625
3 - 5	-.291	.090	-3.23	136	0.002*
3 - 6	-.041	.089	-0.46	136	0.643
4 - 5	-.248	.092	-2.70	136	0.008*
4 - 6	.002	.088	0.02	136	0.984
5 - 6	.250	.095	2.62	136	0.010*

* indicates significant results (α=0.05)

Figure 25. Estimated marginal means of *Skipped subtitles* (%) with the effect of *Order of presentation*
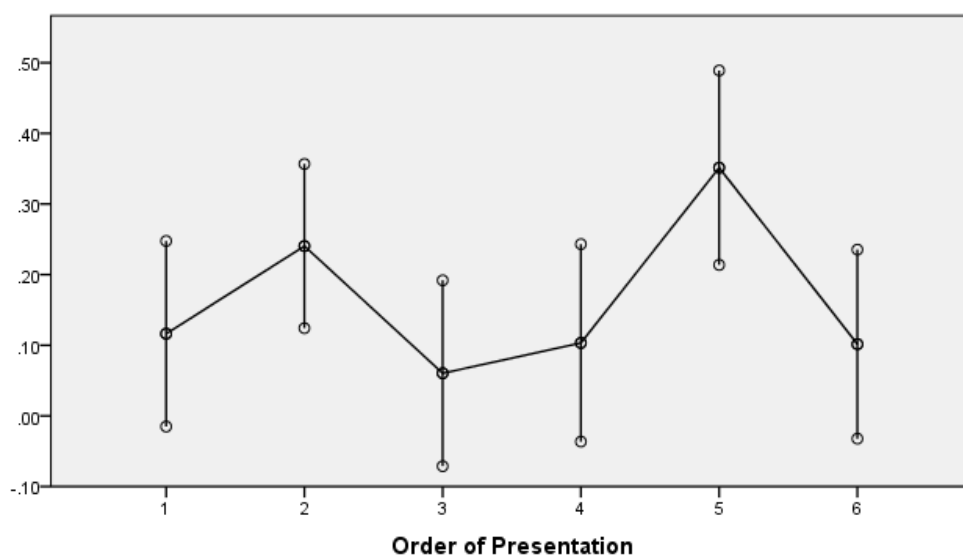
5.3.3.3. Use of subtitling

The participants' declared use of subtitles had a significant effect on the percentage of *Skipped subtitles* ($F=3.11$; $p<0.05$). The estimated means for each of the levels are presented in Table 41. The participants who *never* use subtitles skipped 38% of the subtitles on screen. Those who rarely use subtitles relied almost completely on them and skipped less than 1%. The rest of the participants, who are more used to subtitles, skipped only around 13%.

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Table 41. Estimated marginal means of *Skipped subtitles* with the effect of *Use of subtitling*

Use of subtitling	Mean	Std. Error
Never	.382	.096
Rarely	.005	.078
Occasionally	.125	.040
Very frequently/Always	.136	.044

Once more, the HLE participants who were the only ones who declared they *never* use subtitles had a significantly higher percentage of *Skipped subtitles* than any other group in the sample (p<0.05) for all comparisons between *never* and the other three levels. The results of the pairwise contrasts are included in Table 42 and the representation of the means is shown in Figure 26.

Table 42. Pairwise contrasts of estimated marginal means of *Skipped subtitles* with the effect of *Use of subtitling*

Use of subtitling	Mean difference	Std. Error	t	df	p-value
Never - Rarely	.377	.126	2.99	136	0.003*
Never - Occasionally	.257	.105	2.46	136	0.015*
Never - Very frequently/Always	.246	.108	2.29	136	0.024*
Rarely - Occasionally	-.120	.092	-1.31	136	0.192
Rarely - Very frequently/Always	-.131	.085	-1.53	136	0.128
Occasionally - Very frequently/Always	-.011	.062	-0.172	136	0.864

* indicates significant results (α=0.05)

Figure 26. Estimated marginal means of *Skipped subtitles* (%) with the effect of *Use of subtitling*
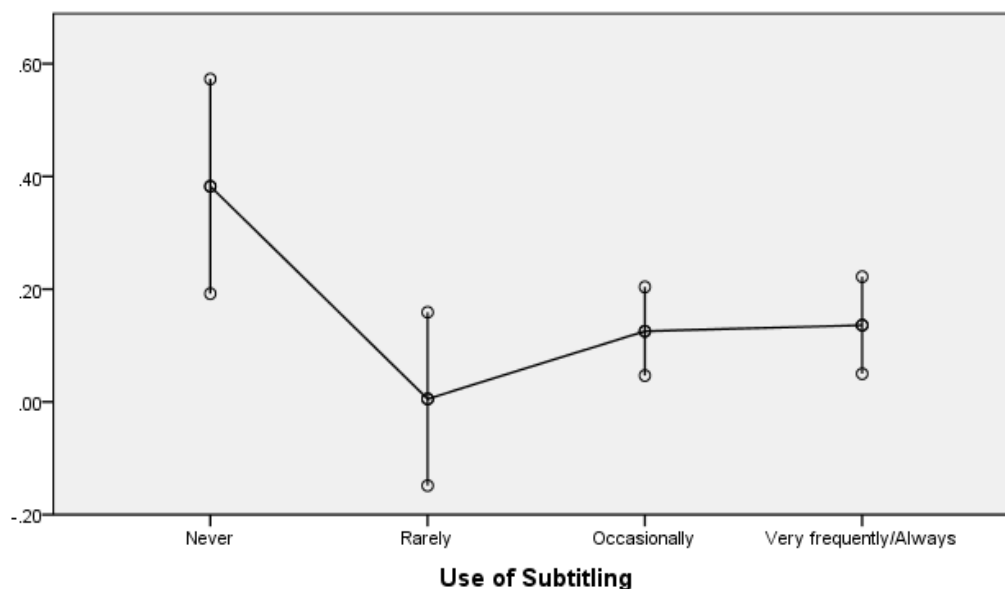
5.3.3.4. Skipped subtitles - Summary

The conclusions that can be drawn from the analysis for *Skipped subtitles* are summarized as follows:

- *Type of subtitle* does not influence the percentage of *Skipped subtitles*.

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- HLE participants skipped 25% of the subtitles while LLE participants skipped only 7%.

- By chance in the assignation of participants to the orders of presentations, the fifth order of presentation included only participants in the HLE group who skipped more subtitles than the others. This offers an interesting point of comparison that will be covered in Section 6.2.1.

- HLE participants who never use subtitles skipped 38% of them, showing a clear decision to avoid fixating on the subtitle area. Those who rarely use subtitles skipped less than 1% of them and those more used to using subtitles skipped about 12%.

5.3.4. Mean fixation duration on the subtitle area

The final model of *Mean fixation duration on the subtitle area* includes the main effects of *Type of subtitle* (F=26.97; p<0.001) and *Use of subtitling* (F=3.35, p<0.05). Additionally, the interaction between *Clip* and *Type of subtitle* was also found to have a significant effect (F=5.83; p<0.01). *Clip* by itself and *Level of L2/L3* did not have a significant effect on *Mean fixation duration on the subtitle area*. *Level of L2/L3* was removed from final model.

5.3.4.1. Type of Subtitle

The *Type of subtitle* had a significant effect on the means fixation on the subtitle area (F=26.97; p<0.001). Table 43 shows that PRO subtitles had the lowest mean fixation duration, 178 ms, while the mean fixation durations on both non-professional subtitles were more similar: NP1 had a mean fixation of 197 ms and NP2 had a mean fixation duration of 202 ms. A graphical representation of the means can be seen in Figure 27.

Table 43. Estimated marginal means of *Mean fixation duration on the subtitle area* (ms) with the effect of *Type of subtitle*

Type of subtitle	Mean	Std. Error
NP1	196.688	4.303
NP2	201.848	4.315
PRO	178.408	4.327

Considering that PRO subtitles have the shortest fixations, the pairwise comparisons of the means indicates there is a 23-ms difference between NP2 version and PRO version (t=6.99; p<0.0001) and an 18-ms difference between PRO and NP1

version (t=-5.49; p<0.0001). No significant differences were found between the two non-professional versions (t=-1.56; p=0.122).

Table 44. Pairwise contrasts of estimated marginal means of *Mean fixation duration on the subtitle area* (ms) with the effect of *Type of subtitle*

Type of subtitle	Mean difference	Std. Error	t	df	p-value
NP1 - NP2	-5.159	3.311	-1.56	135	.122
NP2 - PRO	23.439	3.353	6.99	135	<0.0001*
PRO - NP1	-18.280	3.327	-5.49	135	<0.0001*

* indicates significant results (α=0.05)

Figure 27. Estimated marginal means of *Mean fixation duration on the subtitle area* with the effect of *Type of subtitle*
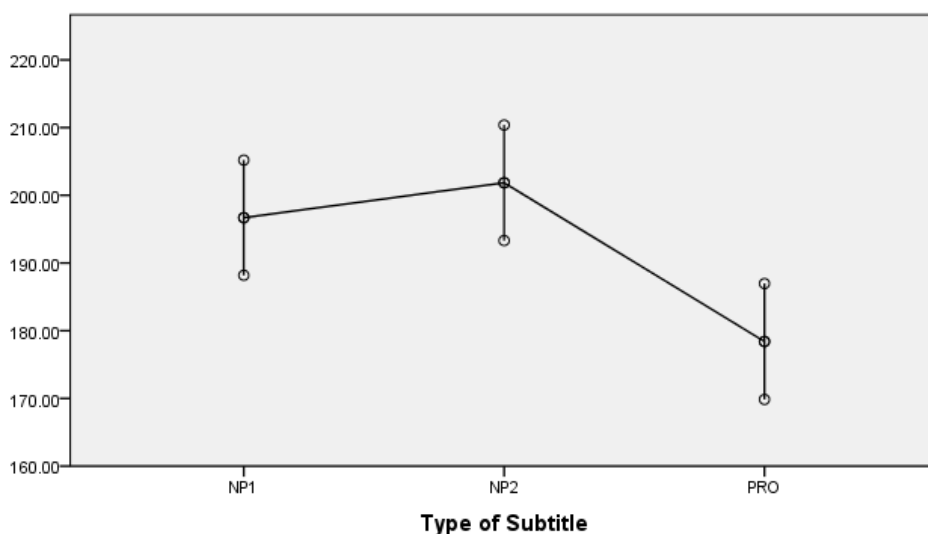
5.3.4.2. Use of subtitling

The *Mean fixation duration on the subtitle area* is significantly affected by the participants' regular use of subtitling (F=3.35, P<0.05). Table 45 presents the mean fixation duration for each level of the *Use of subtitle* variable. The participants who declared they *Never* use subtitling had the longest mean fixation duration (217 ms), while the participants who use subtitles *Very frequently or always* had the shortest mean fixation duration, 179 ms.

Table 45. Estimated marginal means of *Mean fixation duration on the subtitle area* (ms) with the effect of *Use of subtitling*

Use of subtitling	Mean	Std. Error
Never	216.756	10.783
Rarely	183.715	8.808
Occasionally	189.373	4.587
Very frequently/Always	179.415	5.112

Table 46 presents the pairwise comparisons between the levels of *Use of subtitling*. Only the participants who said they *Never* use subtitling have significantly

longer mean fixations on the subtitle area (p<0.05). Their mean fixation duration is between 27 ms and 37 ms longer than the mean fixation duration for the other three groups. These results, combined with the fact that these participants are also the ones who skipped the most subtitles, fixated the least on the subtitle area and had the lowest total fixation duration on the same area, indicate that these participants might go to the subtitle area on very specific occasions and then dedicate a high amount of their cognitive processing on that area. Few and long fixations could be indicators of a conscious and decisive behavior of the participants, triggered by salient aspects of the clip.

Table 46. Pairwise contrasts of estimated marginal means of *Mean fixation duration on the subtitle area* (ms) with the effect of *Use of subtitling*

Use of subtitling	Mean difference	Std. Error	t	df	p-value
Never - Rarely	33.041	13.953	2.37	135	0.019*
Never - Occasionally	27.383	11.694	2.34	135	0.021*
Never - Very frequently/Always	37.341	11.994	3.11	135	0.002*
Rarely - Occasionally	-5.657	9.975	-0.57	135	0.572
Rarely - Very frequently/Always	4.300	10.146	0.42	135	0.672
Occasionally - Very frequently/Always	9.957	6.902	1.44	135	0.151

* indicates significant results (α=0.05)

Figure 28. Estimated marginal means of *Mean fixation duration on the subtitle area* (ms) with the effect of *Use of subtitling*
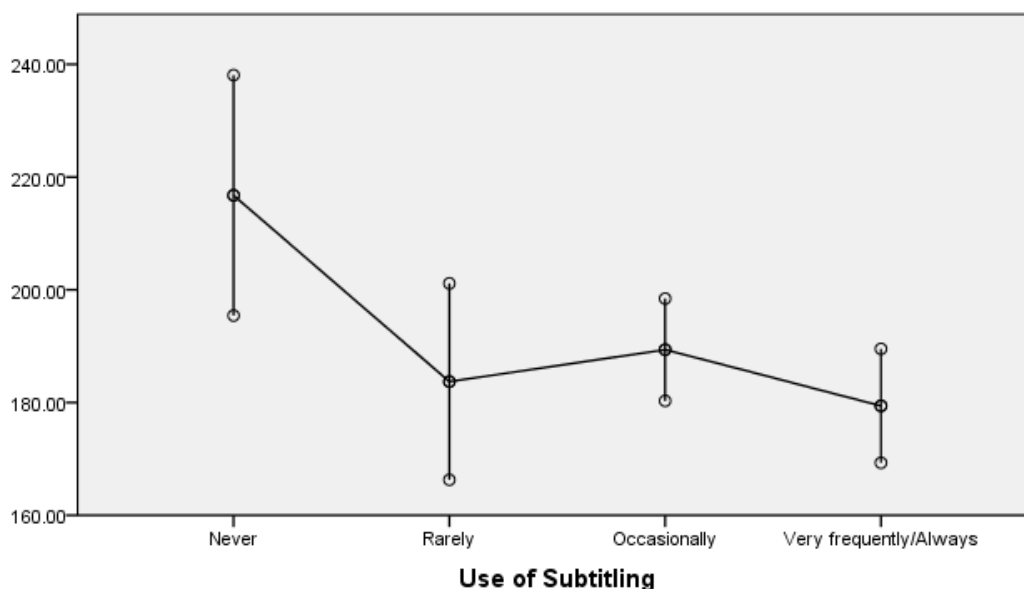
5.3.4.3. Clip and Type of subtitle

A significant interaction effect between *Clip* and *Type of subtitle* was found in the model of *Mean fixation duration on the subtitle area* (F=5.83; p<0.01). Table 47 shows the *Mean fixation durations on the subtitle area* classified by *Type of subtitle* and *Clip*.

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The figures show that mean fixations for NP2 are very similar in all three clips, while the mean fixations for PRO and NP1 have more variation between clips.

Table 47. Estimated marginal means of *Mean fixation duration on the subtitle area* (ms) with the interaction effect between *Clip* and *Type of subtitle*

Type of subtitle	Clip	Mean	Std. Error
NP1	Clip 1	197.352	6.025
	Clip 2	206.866	5.670
	Clip 3	185.846	5.934
NP2	Clip 1	203.274	5.983
	Clip 2	203.220	6.002
	Clip 3	199.049	5.699
PRO	Clip 1	181.162	5.758
	Clip 2	162.525	6.042
	Clip 3	191.537	5.980

The pairwise contrasts of the means are presented in Table 48, with *Type of subtitle* as the reference factor. Again, there is no significant difference between the mean fixation durations for NP2. In the case of NP1, the mean fixation duration in Clip 2 is 21 ms longer than the mean fixation duration in Clip 3 (t=3.03; p<0.05). The mean fixations for PRO had more variation. There is no significant difference between the mean fixations in Clip 1 and Clip 3 for PRO. However, PRO in Clip 2 differs significantly from Clip 1 and Clip 3. There is an 18 ms difference between the mean fixation duration in Clip 1 and Clip 2 (t=2.66; p<0.01) and a 29-ms difference between Clip 2 and Clip 3 (t=-4.14; p<0.0001).

Table 48. Pairwise contrasts of estimated marginal means of *Mean fixation duration on the subtitle area* (ms) with the interaction effect between *Clip* and *Type of subtitle* (*Type of subtitle* as reference factor)

Type of subtitle	Clip	Mean difference	Std. Error	t	df	p-value
NP1	Clip 1 - Clip 2	-9.514	6.828	-1.39	135	0.166
	Clip 1 - Clip 3	11.506	7.047	1.63	135	0.105
	Clip 2 - Clip 3	21.020	6.935	3.03	135	0.003*
NP2	Clip 1 - Clip 2	.054	7.102	1.01	135	0.994
	Clip 1 - Clip 3	4.225	6.807	1.62	135	0.536
	Clip 2 - Clip 3	4.171	6.966	0.60	135	0.550
PRO	Clip 1 - Clip 2	18.637	7.018	2.66	135	0.009*
	Clip 1 - Clip 3	-10.375	7.036	-1.47	135	0.143
	Clip 2 - Clip 3	-29.012	6.999	-4.14	135	<0.0001*

* indicates significant results (α=0.05)

The results of the pairwise comparisons taking *Clip* as the reference factor show there are no significant differences between the measurements of mean fixation duration in Clip 3. In all other cases, the mean fixation duration for PRO is significantly shorter than the mean fixation duration in Clip 2 using the non-professional subtitles (p<0.05 in all cases). It is possible that mean fixation durations are affected by the format used to

display the subtitles. As explained Chapter 6, the non-professional versions used the same standard format included in the video player software, while the display of professional subtitles follows the embedding process used to create the DVDs.

Figure 29. Estimated marginal means of *Mean fixation duration on the subtitle area* (ms) with the interaction effect between *Clip* and *Type of subtitle*
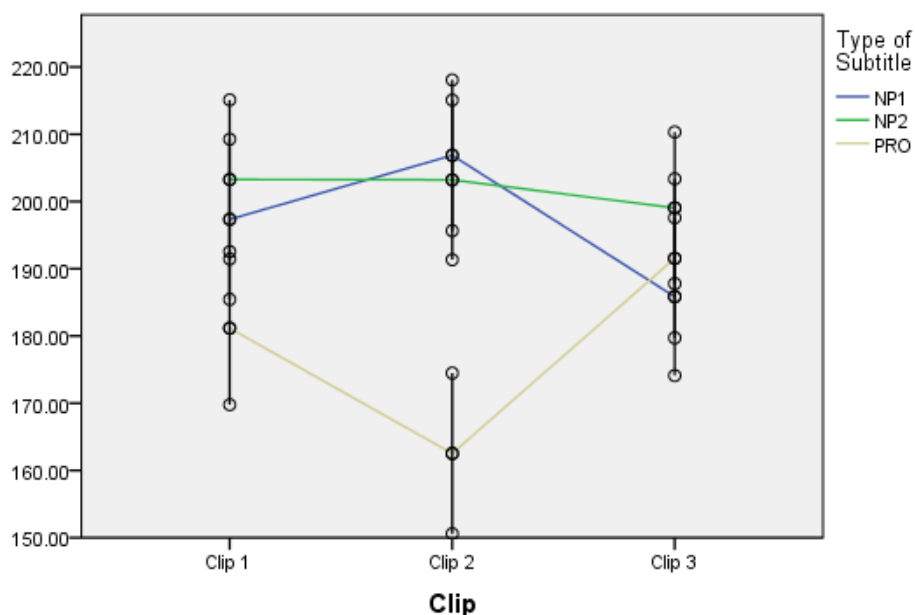
5.3.4.4. Mean fixation duration on the subtitle area - Summary

Below is a shortlist of the conclusions that can be drawn from the analysis for *Mean fixation duration on the subtitle area*:

- Level of proficiency in L2/L3 does not affect the mean fixation duration on the subtitle area.
- The shortest mean fixation durations were reported when participants were watching the professionally subtitled versions of Clip 1 and Clip 2.
- HLE participants who never use subtitles had the longest mean fixation durations. This might indicate their fixations on the subtitles were guided by a conscious interest in them.
- The mean fixation duration on Clip 1 and Clip 2 in the PRO version is significantly shorter.

5.3.5. Mean fixation duration on the image area

The *Mean fixation duration* is calculated by dividing the *Total fixation duration on the image area* by the number of fixations on the same area. The model includes two

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variables that had a significant effect on *Mean fixation duration on the image area*: *Type of subtitle* (F=5.52; p<0.01) and *Level of L2/L3* (F=20.17; p<0.001).

5.3.5.1. Type of subtitle

The *Type of subtitle* had a significant effect on the *Mean fixation duration on the image* (F=5.52; p<0.01). Table 49 presents the mean fixation duration on the image area for each type of subtitle. The shortest mean fixation duration on the image area is that of the PRO versions (333 ms) and the mean fixation duration on the image area in the NP1 versions is the longest (357 ms).

Table 49. Estimated marginal means of *Mean fixation duration on the image area* (ms) with the effect of *Type of subtitle*

Type of subtitle	Mean	Std. Error
NP1	357.002	11.688
NP2	346.595	11.688
PRO	333.456	11.751

Table 50 shows the pairwise comparisons for the mean fixation durations on the image area with the effect of *Type of subtitle*. Only one significant difference was found between the three types of subtitles: there is a mean difference of 23 ms between PRO and NP1 subtitles (t=3.32; p<0.01). Figure 30 shows the graphical representation of the means.

Figure 30. Estimated marginal means of *Mean fixation duration on the image area* (ms) with the effect of *Type of subtitle*

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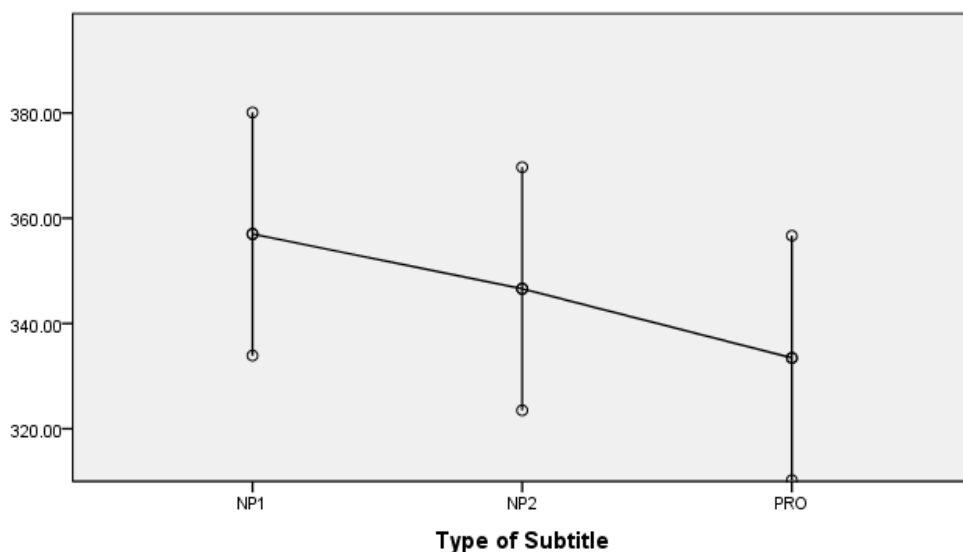
Table 50. Pairwise contrasts of estimated marginal means of *Mean fixation duration on the image area* (ms) with the effect of *Type of subtitle*

Type of subtitle	Mean difference	Std. Error	t	df	p-value
NP1 - NP2	10.407	6.991	1.49	144	0.139
NP2 - PRO	13.138	7.096	1.85	144	0.066
PRO - NP1	-23.546	7.096	-3.32	144	0.001*

* indicates significant results (α=0.05)

5.3.5.2. Level of L2/L3

The participants' level of proficiency in English was also found to have a significant effect on the mean duration of their fixations on the image area (F=20.17; p<0.001). Table 51 shows the mean fixation duration on the image area for the two groups of participants. The mean fixation duration on the image for LLE participants was 296 ms, while the participants in the HLE group had a mean fixation of 395 ms. This translates into a significant difference of 98.6 ms between the two groups (t=4.49, p<0.001).

Table 51. Estimated marginal means of *Mean fixation duration on the image area* (ms) with the effect of *Level of L2/L3*

Level of L2/L3	Mean	Std. Error
Low	296.392	15.512
High	394.977	15.533

5.3.5.3. Mean fixation duration on the image area - Summary

The main highlights from the analysis for *Mean fixation duration on the image area* are:

- The mean fixation duration on the image is also shorter with the professional version of the subtitles. This might indicate that *Type of subtitle* affects not only the behavior on the subtitle area, but also the overall viewing process.
- HLE participants have longer mean fixations on the image than do LLE participants.

5.3.6. Attention shift ratio

Attention shift ratio reports the number of attention shifts participants made per subtitle in the video. A model was constructed to analyze the variables that have an effect on *Attention shift ratio*. Significant effects were found in *Level of L2/L3* (F=7.10; p<0.01), *Clip* (F=6.66; p<0.01), *Use of subtitling* (F=3.48; p<0.05) and *Type of subtitle* (F=7.32; p<0.01). Additionally, the interaction between *Clip* and *Type of subtitle* has a significant effect on *Attention shift ratio* (F=3.08; p<0.05).

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5.3.6.1. Level of L2/L3

Table 52 shows the estimated marginal means of *Attention shift ratio* with the significant effect of *Level of L2/L3* (F=7.10; p<0.01). The participants in the LLE group make 2.09 shifts from the image to the subtitle or vice versa per subtitle, while the mean for HLE participants is 1.72 shifts. This represents a difference of 0.37 shifts (t=2.66; p<0.01).

Table 52. Estimated marginal means of *Attention shift ratio* with the effect of *Level of L2/L3*

Level of L2/L3	Mean	Std. Error
Low	2.090	.119
High	1.716	.101

5.3.6.2. Clip

Clip was also found to have a significant effect on *Attention shift ratio* (F=6.66; p<0.01). The mean values per clip are shown in Table 53. While the means for Clip 1 (1.94) and Clip 3 (1.97) are very similar, the mean attention shift ratio for Clip 2 is lower than the other two, at 1.79.

Table 53. Estimated marginal means of *Attention shift ratio* with the effect of *Clip*

Clip	Mean	Std. Error
Clip 1	1.944	.091
Clip 2	1.791	.091
Clip 3	1.974	.091

The pairwise contrasts of the mean *attention shift ratio* are presented in Table 54. There is no significant difference between Clip 1 and Clip 3, but Clip 2 is significantly different from the other two. There is a 0.15-shift difference between Clip 1 and Clip 2 (t=2.81; p<0.01) and a 0.18-shift difference between Clip 2 and Clip 3 (t=-3.41; p<0.01). The means are also shown in Figure 31.

Table 54. Pairwise contrasts of estimated marginal *Attention shift ratio* with the effect of *Clip*

Clips	Mean difference	Std. Error	t	df	p-value
Clip 1 - Clip 2	.153	.054	2.81	135	0.006*
Clip 2 - Clip 3	-.183	.054	-3.41	135	0.001*
Clip 3 - Clip 1	.030	.054	0.56	135	0.577

* indicates significant results (α=0.05)

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Figure 31. Estimated marginal means of *Attention shift ratio* with the effect of *Clip*
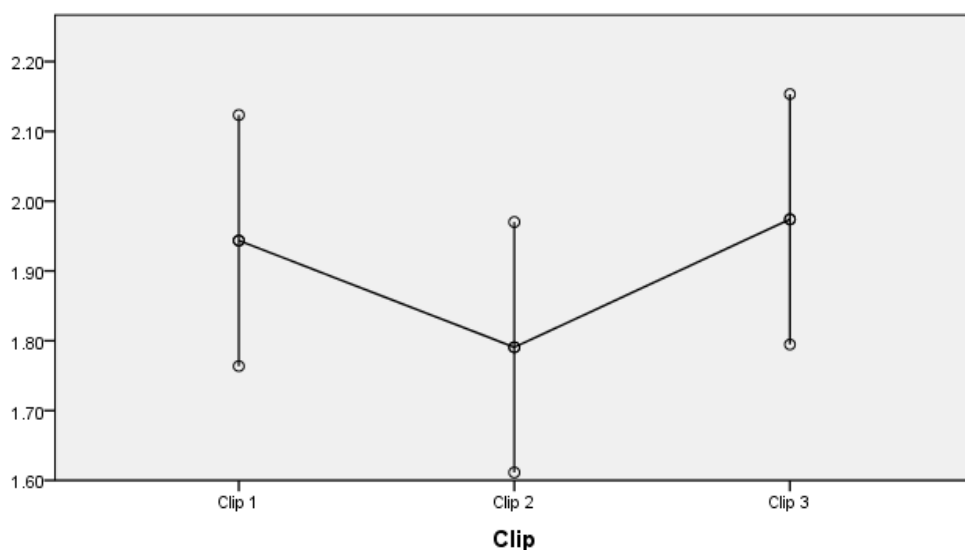
5.3.6.3. Use of subtitling

A significant effect of the participants' regular *Use of subtitling* on *Attention shift ratio* was found in the model ($F=3.48$; $p<0.05$). Table 55 shows the estimated marginal means of *Attention shift ratio* for each level of *Use of subtitling*. The participants who said they *Never* use subtitling have the lowest mean, 1.3 shifts, while the participants who *Rarely* use subtitles had the highest mean at 2.2 shifts per subtitle.

Table 55. Estimated marginal means of *Attention shift ratio* with the effect of *Use of subtitling*

Use of subtitling	Mean	Std. Error
Never	1.303	.244
Rarely	2.258	.191
Occasionally	2.082	.101
Very frequently/Always	1.969	.111

Table 56 shows the results of the pairwise contrasts of the means. Only the comparisons involving the *Never* level give significant results. There is a 0.95-shift difference between *Never* and *Rarely* ($t=-3.07$; $p<0.01$) and a 0.78-shift difference between *Never* and *Occasionally* ($t=-2.89$; $p<0.01$). In the case of *Never* and *Very frequently/always*, the mean difference is 0.67 shifts ($t=-2.49$, $p<0.05$). The graph in Figure 32 shows the mean attention shifts per subtitle for each level of *Use of subtitling*.

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Table 56. Pairwise contrasts of estimated marginal *Attention shift ratio* with the effect of *Use of subtitling*

Use of subtitling	Mean difference	Std. Error	t	df	p-value
Never - Rarely	-.955	.311	-3.07	135	0.003*
Never - Occasionally	-.779	.269	-2.89	135	0.004*
Never - Very frequently/Always	-.666	.267	-2.49	135	0.014*
Rarely - Occasionally	.175	.217	0.81	135	0.420
Rarely - Very frequently/Always	.289	.220	1.31	135	0.192
Occasionally - Very frequently/Always	.113	.152	0.75	135	0.455

* indicates significant results (α=0.05)

Figure 32. Estimated marginal means of *Attention shift ratio* with the effect of *Use of subtitling*
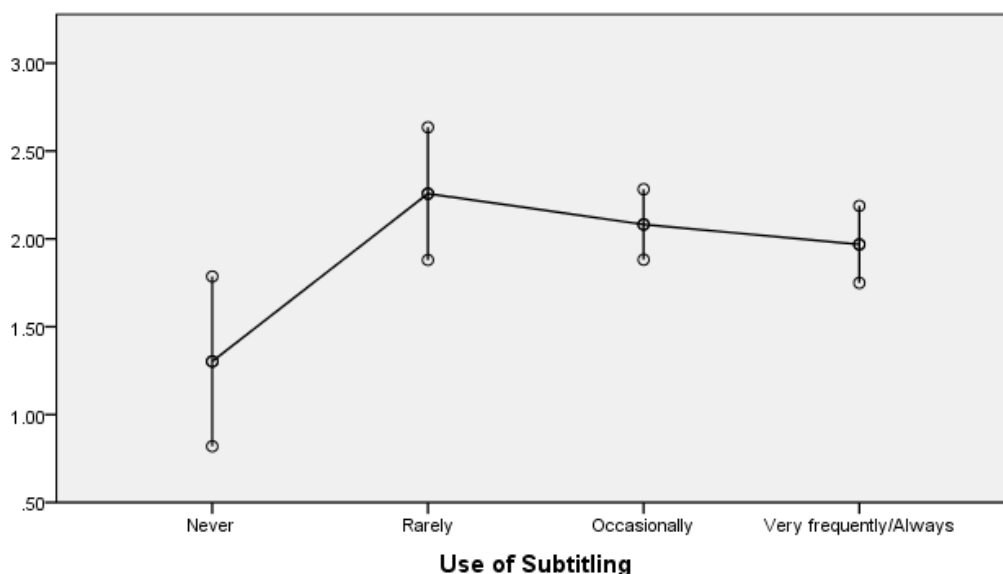
5.3.6.4. Type of Subtitle

The different types of subtitles have a significant effect on *Attention shift ratio* (F=7.32; p<0.01). The adjusted means for attention shifts with the effect of *Type of subtitle* are shown in Table 57. The means for NP1 and NP2 are very similar, but the mean for PRO is higher. As shown in Table 58, the pairwise comparisons indicate there are significant differences between the mean of the PRO version and the means of the two non-professional versions. The mean attention shift ratio per subtitle in the PRO version is 0.21 shifts higher than the mean in the NP2 version (t=-3.77; p<0.001) and it is also 0.14 shifts higher than the mean in NP1 (t=2.50; p<0.05).

Table 57. Estimated marginal means of *Attention shift ratio* with the effect of *Type of subtitle*

Type of subtitle	Mean	Std. Error
NP1	1.880	.091
NP2	1.811	.091
PRO	2.016	.091

Table 58. Pairwise contrasts of estimated marginal means of *Attention shift ratio* with the effect of *Type of subtitle*

Type of subtitle	Mean difference	Std. Error	t	df	p-value
NP1 - NP2	.069	.054	1.28	135	0.202
NP2 - PRO	-.205	.054	-3.77	135	0.000*
PRO - NP1	.136	.054	2.50	135	0.014*

* indicates significant results (α=0.05)

Figure 33. Estimated marginal means of *Attention shift ratio* with the effect of *Type of subtitle*
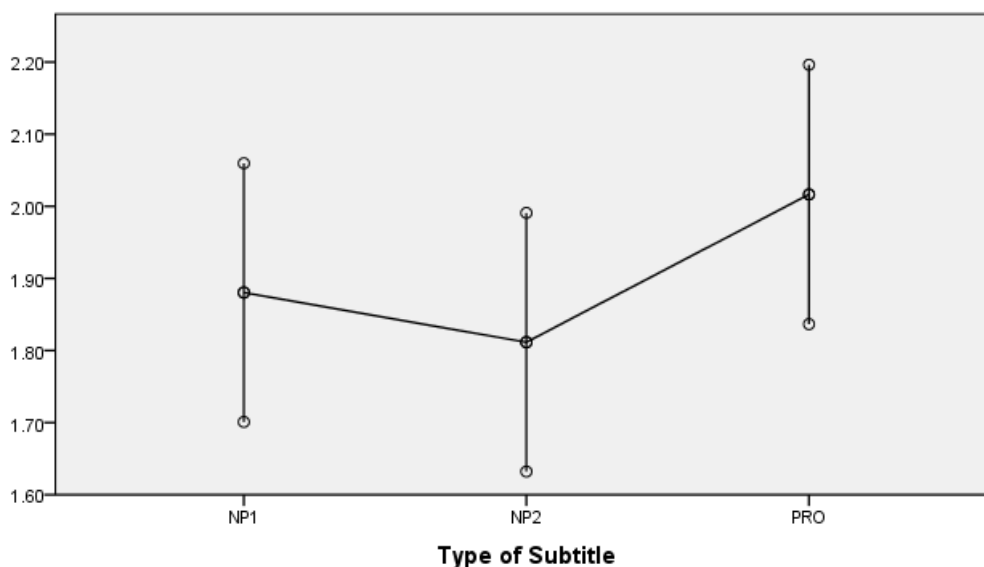
5.3.6.5. Clip and Type of subtitle

The interaction between *Clip* and *Type of subtitle* had a significant effect on the *Attention shift ratio* (F=3.08; p<0.05). Table 59 shows the mean *Attention shift ratio* as a function of *Type of subtitle* and *Clip*. By looking at the values, it can be seen that the mean attention shifts per subtitle in Clip 2 with NP2 is the lowest of all the figures.

Table 59. Estimated marginal means of *Attention shift ratio* with the interaction between *Clip* and *Type of subtitle*

Type of subtitle	Clip	Mean	Std. Error
NP1	Clip 1	1.960	.115
	Clip 2	1.842	.110
	Clip 3	1.838	.113
NP2	Clip 1	1.930	.115
	Clip 2	1.511	.113
	Clip 3	1.994	.110
PRO	Clip 1	1.941	.111
	Clip 2	2.019	.115
	Clip 3	2.090	.114

Table 60 presents the mean values for attention shifts taking *Clip* as the reference factor. In Clip 2, mean differences are significantly shorter for NP2. A graphical representation of the means is shown in Figure 34. Considering *Clip* as the reference

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factor, the only significant differences are found in the NP2 version of Clip 2. There is a 0.42-shift ratio difference on average between Clip 1 and Clip 2 (t=3.57; p<0.01). The difference between Clip 2 and Clip 3 is -0.48 shifts (t=-4.18; p<0.0001).

Table 60. Pairwise contrasts of estimated marginal means of *Attention shift ratio* with the interaction effect between *Clip* and *Type of subtitle* (*Clip* as reference factor)

Type of subtitle	Clip	Mean difference	Std. Error	t	df	p-value
Clip 1	NP1 - NP2	.030	.117	0.26	135	0.795
	NP2 - PRO	-.011	.118	-0.09	135	0.927
	PRO - NP1	-.020	.118	-0.17	135	0.867
Clip 2	NP1 - NP2	.331	.116	2.86	135	0.005*
	NP2 - PRO	-.508	.117	-4.32	135	0.0001*
	PRO - NP1	.177	.115	1.53	135	0.127
Clip 3	NP1 - NP2	-.155	.116	-1.34	135	0.182
	NP2 - PRO	-.096	.114	-0.84	135	0.402
	PRO - NP1	.252	.118	2.13	135	0.035

* indicates significant results (α=0.05)

Figure 34. Estimated marginal means of *Attention shift ratio* with the interaction between *Clip* and *Type of subtitle*
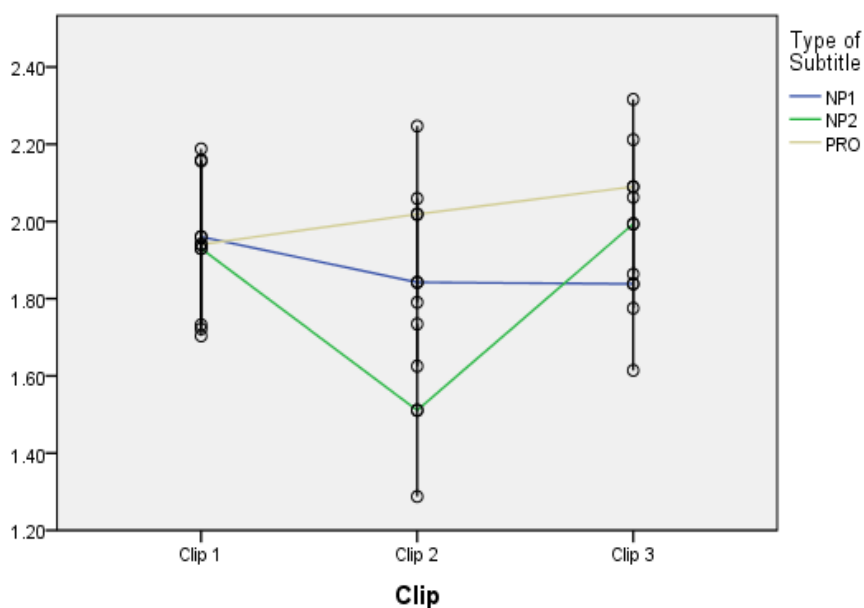
5.3.6.6. Attention shift ratio - Summary

The main highlights resulting from the analysis of Attention shift ratio are as follows:

- In accordance with the percentage of fixations on the subtitle area, the participants in the HLE group made fewer attention shifts.
- Clip 2 had significantly less attention shifts probably because the participants followed the subtitles more closely.
- HLE participants who had never used subtitles made significantly fewer shifts, given that they skipped 25% of the subtitles.

- The PRO version had significantly more attention shifts than did the other types of subtitles.

- Clip 2 with NP2 had the lowest mean attention fixation among all the combinations of clips and subtitles.

5.3.7. *Subtitle-reading effort*

The participants in the experiment were asked to rate the difficulty they had following the subtitles, using a scale ranging from 0=*very difficult* to 5=*very easy*. Table 61 presents the model with the variables and interactions that had a significant effect on *Subtitle-reading effort*. The variables were *Prior knowledge of the clips* (F=9.51; p<0.01) and *Use of subtitling* (F=3.06; p<0.05). The interaction between *Clip* and *Type of subtitle* was also found to have a significant effect (F=3.10; p<0.05). The *Type of subtitle* variable did not have a significant effect, and neither did *Level of L2/L3*. The latter is not included in the final model because, although by itself it is not significant, it affects the results of the significant variables.

Table 61. Final model with significant main effects and interactions of *Subtitle-reading effort*

Predictor	F	Numerator df	Denominator df	p-value
Clip	1.14	2	141	0.322
Subs	0.60	2	141	0.552
Watched	9.51	1	141	0.002*
Subtitling	3.06	3	141	0.030*
Clip * Subs	3.10	4	141	0.018*

* indicates significant results (α=0.05)

5.3.7.1. *Prior knowledge of the clips*

A significant effect was found for the participants' previous knowledge of the clip on the difficulty they had to read the subtitles (F=9.51; p<0.01). Table 62 shows the estimated means for *Subtitle-reading effort* for the levels of *Prior knowledge of the clips*. The mean is higher for the participants who have previously seen the clips. There is a 0.59 mean difference between the two groups (t=3.08; p<0.01).

Table 62. Estimated marginal means of *Subtitle-reading effort* with the effect of *Prior knowledge of the clips*

Watched	Mean	Std. Error
Yes	4.201	.182
No	3.606	.120

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5.3.7.2. *Use of subtitling*

There is a significant effect of *Use of subtitling* on *Subtitle-reading effort* (F=3.06; p<0.05). The mean values of *Subtitle-reading effort* for all levels of *Use of subtitling* are shown in Table 63. The participants who rated the subtitles higher were those at the *Never* level. As has been seen in the previous results, these are participants from the HLE group who barely look at the subtitle area but have longer mean fixations on the subtitles.

Table 63. Estimated marginal means of *Subtitle-reading effort* with the effect of *Use of subtitling*

Use of subtitling	Mean	Std. Error
Never	4.618	.300
Rarely	3.610	.261
Occasionally	3.669	.151
Very frequently/Always	3.716	.157

Table 64 presents the pairwise comparisons of the means of *Subtitle-reading effort* with the effect of *Use of subtitling*. The mean of the participants at the *Never* level differs by about 1 point from all other mean (p<0.05 in all cases), as shown in Figure 35.

Table 64. Pairwise contrasts of estimated marginal means of *Subtitle-reading effort* with the effect of *Use of subtitling*

Use of subtitling	Mean difference	Std. Error	t	df	p-value
Never - Rarely	1.008	.391	2.58	141	0.011*
Never - Occasionally	.949	.328	2.90	141	0.004*
Never - Very frequently/Always	.902	.338	2.67	141	0.009*
Rarely - Occasionally	-.059	.289	-.20	141	0.839
Rarely - Very frequently/Always	-.106	.298	-0.36	141	0.722
Occasionally - Very frequently/Always	-.047	.214	-0.22	141	0.825

* indicates significant results (α=0.05)

Figure 35. Estimated marginal means of *Subtitle-reading effort* with the effect of *Use of subtitling*
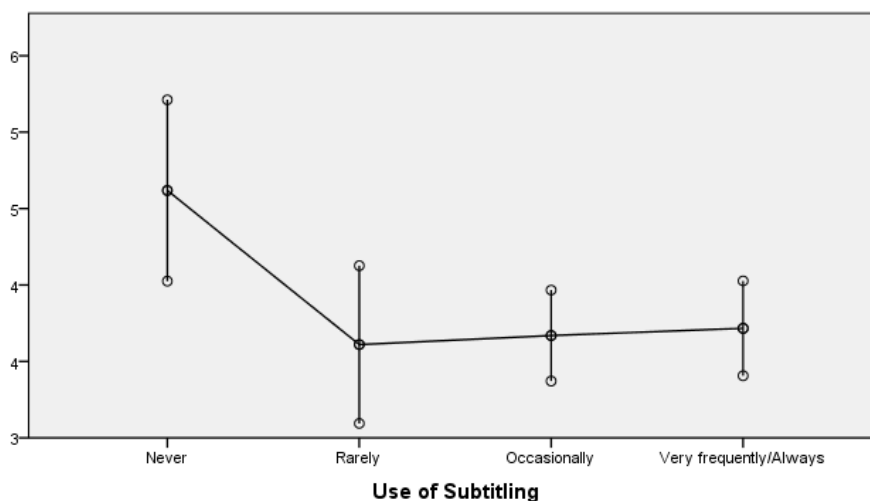
5.3.7.3. Clip and Type of subtitle

The interaction between *Clip* and *Type of subtitle* was found to have a significant effect on *Subtitle-reading effort* (F=3.10; p<0.05). The mean *Subtitle-reading effort* scores per *Clip* and *Type of subtitle* are shown in Table 65. The means for Clip 2 are lower than 4 in all cases. In Clip 1, the lowest mean is 3.57 points in the NP2 version, while for Clip 3 it is the PRO version the one that shows the lowest score, 3.59.

Table 65. Estimated marginal means of *Subtitle-reading effort* with the interaction effect between *Clip* and *Type of subtitle*

Clip	Type of subtitle	Mean	Std. Error
Clip 1	NP1	4.003	.224
	NP2	3.572	.205
	PRO	4.322	.204
Clip 2	NP1	3.845	.209
	NP2	3.633	.217
	PRO	3.875	.213
Clip 3	NP1	4.035	.215
	NP2	4.248	.210
	PRO	3.599	.217

Table 66 shows the pairwise comparisons considering *Clip* as the reference factor. The values in the table indicate there is a 0.75-point significant difference in Clip 1 between the NP2 and the PRO version (t=-2.85; p<0.01), with the PRO version having a higher score. In Clip 3, there is also a 0.65-point significant difference between NP2 and PRO, but in this case the higher score is that of NP2 (t=2.39; p<0.05). The graphical representation of these means is shown in Figure 36.

Table 66. Pairwise contrasts of estimated marginal means of *Subtitle-reading effort* with the interaction effect between *Clip* and *Type of subtitle* (*Clip* as reference factor)

Clip	Type of subtitle	Mean difference	Std. Error	t	df	p-value
Clip 1	NP1 - NP2	.431	.271	1.59	141	0.115
	NP2 - PRO	-.750	.263	-2.85	141	0.005*
	PRO - NP1	.319	.272	1.17	141	0.242
Clip 2	NP1 - NP2	.212	.281	0.75	141	0.453
	NP2 - PRO	-.242	.281	-0.86	141	0.390
	PRO - NP1	.031	.265	0.17	141	0.908
Clip 3	NP1 - NP2	-.214	.270	-0.79	141	0.429
	NP2 - PRO	.649	.271	2.39	141	0.018*
	PRO - NP1	-.435	.280	-1.56	141	0.122

* indicates significant results (α=0.05)

According to the pairwise comparisons of the means, and taking *Type of subtitle* as reference factor, there are no significant differences for NP1 between the three clips. In the case of the NP2 version, the subtitle-reading difficulty score for Clip 3 is

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significantly different from the other two. There is a 0.62 difference between the scores for Clip 2 and Clip 3 (t=-2.19; p<0.05) and a 0.68 difference between the scores for Clip 3 and Clip 1 (t=2.57; p<0.05). There is only one significant difference among the clips with professional subtitles. The mean scores for Clip 3 and Clip 1 differ by 0.72 points (t=-2.65; p<0.01).

Figure 36. Estimated marginal means of *Subtitle-reading effort* with the interaction effect between *Clip* and *Type of subtitle*
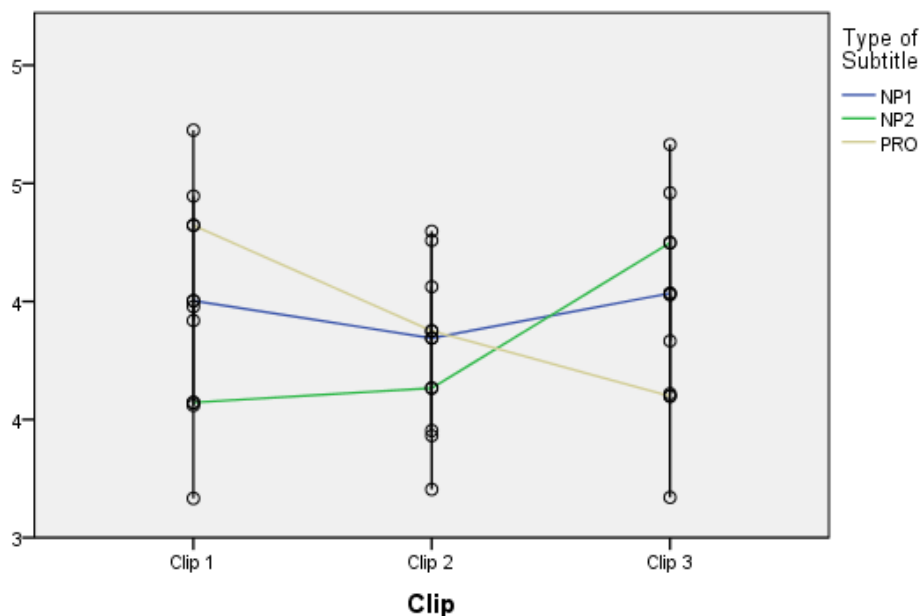
5.3.7.4. Subtitle-reading effort - Summary

The conclusions that can be drawn from the analysis of *Subtitle-reading effort* are summarized as follows:

- *Type of subtitle* and *Level of L2/L3* did not have a significant effect on *Subtitle-reading effort*, but the interaction between *Clip* and *Type of subtitle* was significant.

- The participants who had already seen the clips gave higher scores (indicators of less effort) for *Subtitle-reading effort*.

- HLE participants who never use subtitles rated them almost one point higher than all the other participants.

- While the ratings for Clip 1 and Clip 3 range from 3.5 to 4.3, there is less variation in the average rating for Clip 2. In all cases the average for *Subtitle-reading effort* for Clip 2 is between 3.5 and 3.8.

5.3.8. Audience enjoyment

Audience enjoyment was measured on a scale ranging from *1=boring* to *4=great fun*. Three variables were found to have a significant effect on *Audience enjoyment*: the final model, shown in Table 67, includes *Level of L2/L3* (F=7.17; p<0.01), *Clip* (F=10.22; p<0.001) and *Subtitle-reading effort* (F=7.12; p<0.01). No interaction effect was found to be significant.

Table 67. Final model with significant main effects on *Audience enjoyment*

Predictor	F	Numerator df	Denominator df	p-value
L2L3Level	7.17	1	147	0.008*
Clip	10.22	2	147	0.000*
Trans_Read_Effort	7.12	3	147	0.000*

5.3.8.1. Level of L2/L3

The participants' level of proficiency in English was found to have a significant effect on their enjoyment of the material (F=7.17; p<0.01). Table 68 shows the estimated means for the two groups. The participants in the LLE group gave a mean enjoyment score of 2.49, while the mean for HLE participants was 2.86 (t=2.68; p<0.01).

Table 68. Estimated marginal means of *Audience enjoyment* with the effect of *Level of L2/L3*

Level of L2/L3	Mean	Std. Error
Low	2.494	.098
High	2.855	.097

5.3.8.2. Clip

The clips also had a significant effect on the participants' enjoyment (F=10.22; p<0.001). As shown in Table 69, the mean for Clip 1 was 2.48, the mean for Clip 2 was 2.56 and the mean for Clip 3 was 2.97. Table 70 shows the pairwise comparisons for these means. The mean score of Clip 3 is significantly different from the other two. There is a 0.41-point difference between Clip 2 and Clip 3 (t=-3.48; p<0.01) and a 0.49-point difference between Clip 3 and Clip 1 (F=4.23; p<0.001).

Table 69. Estimated marginal means of *Audience enjoyment* with the effect of Clip

Clip	Mean	Std. Error
Clip 1	2.485	.096
Clip 2	2.566	.099
Clip 3	2.972	.097

Table 70. Pairwise contrasts of estimated marginal means of *Audience enjoyment* with the effect of *Level of L2/L3*

Clips	Mean difference	Std. Error	t	df	p-value
Clip 1 - Clip 2	-.081	.117	-0.69	147	0.489
Clip 2 - Clip 3	-.406	.117	-3.48	147	0.001*
Clip 3 - Clip 1	.487	.115	4.23	147	0.0004*

* indicates significant results (α=0.05)

5.3.8.3. Subtitle-reading effort

The *Subtitle-reading effort* variable had a significant effect on *Audience enjoyment* (F=7.12; p<0.01). Table 71 shows the estimated marginal means for all the levels of *Subtitle-reading effort* (0 and 1 are not included because they were not chosen by the participants in their answers).

Table 71. Estimated marginal means of *Audience enjoyment* with the effect of *Subtitle-reading effort*

Subtitle-reading effort	Mean	Std. Error
2	2.401	.145
3	2.419	.120
4	2.695	.091
5	3.182	.141

Table 72 shows the pairwise contrasts between the means of *Audience enjoyment* with the effect of *Subtitle-reading effort*. No significant difference was found between levels 2 and 3, nor 2 and 4. The difference between 3 and 4 was 0.28 points (t=1.99; p<0.05). Level 5 was significantly different from the other three groups. There was a 0.78 difference between 2 and 5 (t=-3.92; p<0.001). The difference between 3 and 5 was 0.76 (t=-4.23; p<0.001) and the mean difference between 4 and 5 was 0.49 (t=3.09; p<0.01). The means are presented graphically in Figure 37.

Table 72. Pairwise contrasts of estimated marginal means of *Audience enjoyment* with the effect of *Subtitle-reading effort*

Subtitle-reading effort	Mean difference	Std. Error	t	df	p-value
2 – 3	-.017	.176	-0.10	147	0.922
2 – 4	-.294	.162	-1.82	147	0.071
2 – 5	-.780	.199	-3.92	147	<0.001*
3 – 4	-.277	.139	-1.99	147	0.048*
3 – 5	-.763	.180	-4.23	147	0.0004*
4 – 5	-.486	.157	-3.09	147	0.002*

* indicates significant results (α=0.05)

Figure 37. Estimated marginal means of *Audience enjoyment* with the effect of *Subtitle-reading effort*
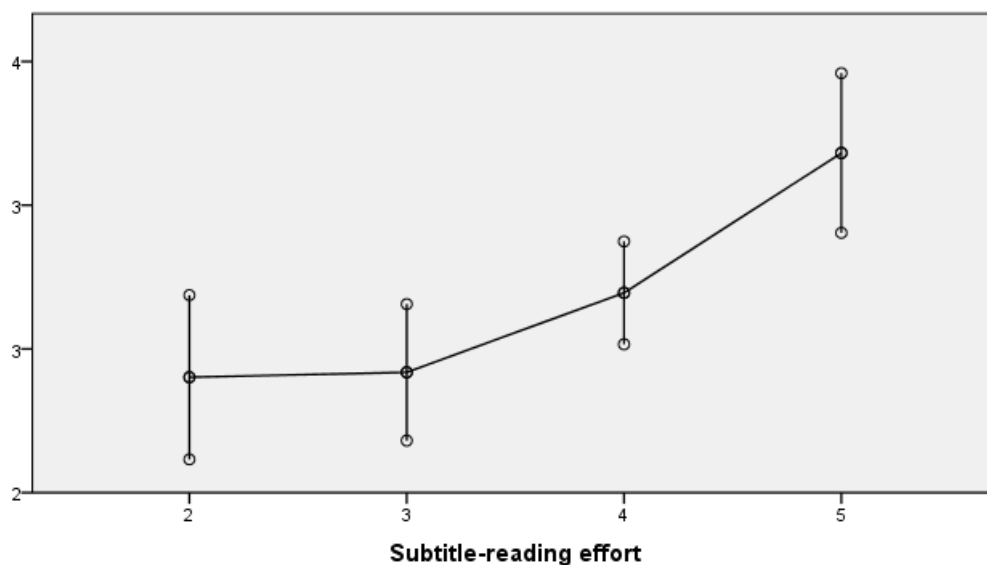
5.3.8.4. Audience enjoyment - Summary

The main highlights resulting from the analysis of *Audience enjoyment* are:

- The types of subtitles did not affect self-reported *Audience enjoyment*.
- HLE participants reported a higher degree of enjoyment.
- Enjoyment depends on the clips.
- Enjoyment is affected by *Subtitle-reading effort*: in cases when the participants said the subtitles were easier to follow, they also reported a higher degree of enjoyment.

5.3.9. Self-reported comprehension

The model constructed for analyzing the participants' ratings of their comprehension of the clips is shown in Table 73. The variables that have a significant effect on these scores are *Prior knowledge of the clips* (F=6.70; $p<0.05$), *Use of subtitling* (F=3.78; $p<0.05$), *Audience enjoyment* (F=3.91; $p<0.05$) and *Narrative attention* (F=7.58; $p<0.01$). The interaction between *Clip* and *Type of subtitle* also has a significant effect on *Self-reported comprehension* (F=2.92; $p<0.05$). *Level of L2/L3* did not have a significant effect.

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Table 73. Final model with significant main effects and interactions of *Self-reported comprehension*

Predictor	F	Numerator df	Denominator df	p-value
Clip	0.347	2	138	0.707
Subs	1.54	2	138	0.218
Watched	6.70	1	138	0.011*
Subtitling	3.78	3	138	0.012*
Enjoyment	3.91	3	138	0.010*
Narr.Atte	7.58	2	138	0.001*
Clip * Subs	2.92	4	138	0.024*

* indicates significant results (α=0.05)

5.3.9.1. Prior knowledge of the clips

The fact that some of the participants had already seen the clips prior to the experiment proved to have a significant effect on their self-reported comprehension (F=6.70; p<0.05). The mean self-reported comprehension for those who were watching the clip for the first time was 3.45, while the mean for the participants who had watched the clip before was 3.86. The difference between the two means is 0.407 points (t=2.60; p<0.05).

Table 74. Estimated marginal means of *Self-reported comprehension* with the effect of *Prior knowledge of the clips*

Watched	Mean	Std. Error
Yes	3.857	.173
No	3.450	.128

5.3.9.2. Use of subtitling

Table 75 shows the mean *Self-reported comprehension* scores for all the levels of *Use of subtitling*. The participants who *Never* use subtitles had the highest comprehension scores, 4.28, while the participants who *Rarely* use subtitling had the lowest self-reported comprehension score, 3.3.

Table 75. Estimated marginal means of *Self-reported comprehension* with the effect of *Use of subtitling*

Use of subtitling	Mean	Std. Error
Never	4.278	.261
Rarely	3.268	.230
Occasionally	3.613	.146
Very frequently/Always	3.456	.157

Table 76 shows the pairwise comparisons of the means of *Self-reported comprehension* with the effect of *Use of subtitling*. The results show that the participants at the *Never* level reported significantly greater comprehension than did the

participants in all three other groups (p<0.05 in all cases). Figure 38 shows the mean self-reported comprehension ratings for all groups.

Table 76. Pairwise contrasts of estimated marginal means of *Self-reported comprehension* with the effect of *Use of subtitling*

Use of subtitling	Mean difference	Std. Error	t	df	p-value
Never - Rarely	1.010	.320	3.15	138	0.002*
Never - Occasionally	.666	.270	2.47	138	0.015*
Never - Very frequently/Always	.823	.278	2.96	138	0.004*
Rarely - Occasionally	-.345	.236	-1.46	138	0.146
Rarely - Very frequently/Always	-.188	.243	-0.77	138	0.441
Occasionally - Very frequently/Always	.157	.174	0.90	138	0.368

* indicates significant results (α=0.05)

Figure 38. Estimated marginal means of *Self-reported comprehension* with the effect of *Use of subtitling*
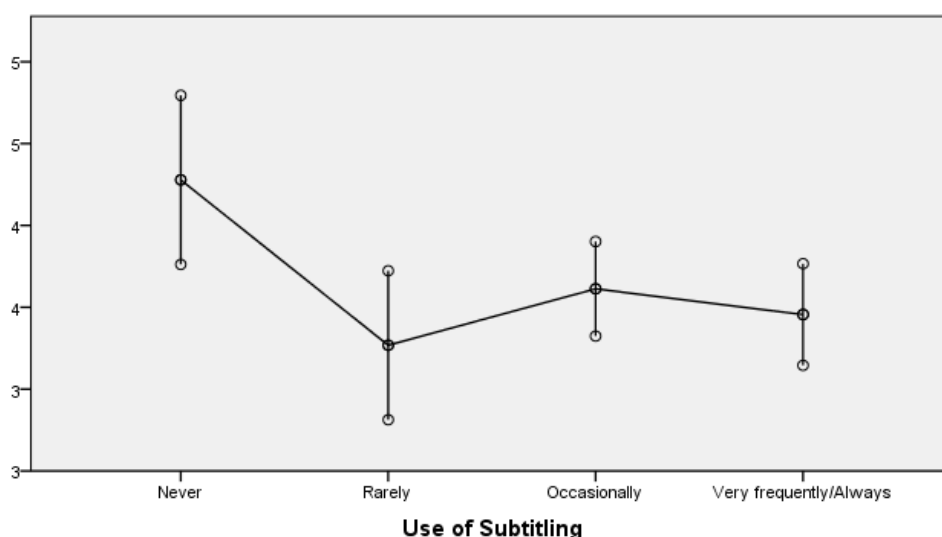
5.3.9.3. Audience enjoyment

The participants' enjoyment was found to have a significant effect on *Self-reported comprehension* (F=3.91; p<0.05). The lowest mean is 3.4 for the participants who said the clip was *boring*, and the highest mean is 4.1 for the participants who thought the clip was *great fun*. As shown in Figure 39, mean scores for *Self-reported comprehension* grow as participants declare higher enjoyment.

Table 77. Estimated marginal means of *Self-reported comprehension* with the effect of *Audience enjoyment*

Enjoyment	Mean	Std. Error
Boring	3.404	.261
2	3.516	.141
3	3.602	.128
Great fun	4.093	.173

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The pairwise contrasts of the estimated means of the self-reported comprehension scores are presented in Table 78. The mean difference in self-reported comprehension scores between *boring* and *great fun* is 0.69 points (t=-2.40; p<0.05). The participants who declared they had *great fun* watching the clips also had a 0.58-point difference with respect to the participants who picked 2 (t=-3.26; p<0.01) and a difference of 0.49 points with respect to the participants who picked 3 (t=-3.06; p<0.01).

Table 78. Pairwise contrasts of estimated marginal means of *Self-reported comprehension* with the effect of *Use of subtitling*

Enjoyment	Mean difference	Std. Error	t	df	p-value
Boring – 2	-.113	.233	-0.48	138	0.630
Boring – 3	-.198	.243	-0.81	138	0.417
Boring – Great fun	-.689	.287	-2.40	138	0.018*
2 – 3	-.085	.120	-0.71	138	0.479
2 – Great fun	-.576	.177	-3.26	138	0.001*
3 – Great fun	-.491	.160	-3.06	138	0.003*

* indicates significant results (α=0.05)

Figure 39. Estimated marginal means of *Self-reported comprehension* with the effect of *Audience enjoyment*
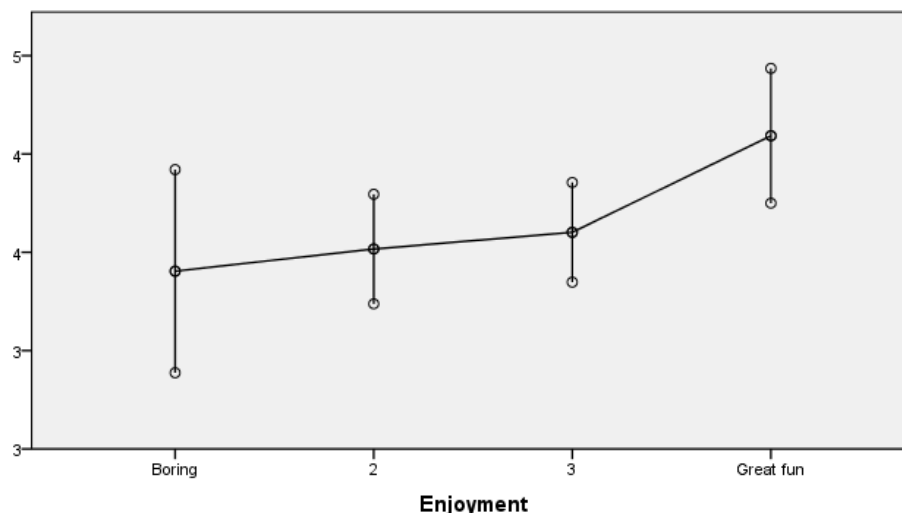
5.3.9.4. Narrative attention

Narrative attention was assessed by means of two questions participants were asked after watching the clip. For each question answered correctly, the participants received one point. The scores for narrative attention were found to have an effect on the participants' self-reported comprehension (F=7.58; p<0.01). Table 79 shows the estimated means of *Self-reported comprehension* with the effect of *Narrative attention*. The lowest mean self-reported comprehension score is 3.0 for the participants who did

not answer any of the questions correctly. The scores for the participants who answered one or two questions correctly are very similar: 4.0 and 3.8 respectively.

Table 79. Estimated marginal means of *Self-reported comprehension* with the effect of *Narrative attention*

Narrative attention	Mean	Std. Error
0	3.057	.251
1	4.020	.128
2	3.884	.123

Table 80 presents the pairwise contrasts of the mean for each level of *Narrative attention*. There are no significant differences between the participants who answered 1 or 2 questions correctly. However, the differences between the participants who did not answer any question correctly and those who answered one question correctly is 0.96 points ($t=-3.89$; $p<0.001$) and the difference between the participants with two correct answers and those with no correct answers at all is 0.83 points ($t=3.426$; $p<0.01$).

Table 80. Pairwise contrasts of estimated marginal means of *Self-reported comprehension* with the effect of *Narrative attention*

Narrative attention	Mean difference	Std. Error	t	df	p-value
0 - 1	-.963	.247	-3.89	138	0.000*
1 - 2	.136	.109	1.25	138	0.213
2 - 0	.827	.241	3.43	138	0.001*

* indicates significant results ($\alpha=0.05$)

5.3.9.5. Clip and Type of subtitle

An interaction between *Clip* and *Type of subtitle* was found for *Self-reported comprehension* ($F=2.92$; $p<0.05$). The estimated means of *Self-reported comprehension* scores are shown in Table 81, as well as graphically in Figure 40.

In the pairwise comparisons, the NP2 version stands out from the other versions in two cases. When considering the clips as reference factors, in Clip 2 there is a 0.50 difference in the mean self-reported comprehension scores between the NP2 and the PRO versions ($t=-2.31$; $p<0.05$). In Clip 3 there is a significant difference of 0.57 points between the NP1 and NP2 versions ($t=-2.67$; $p<0.01$).

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Table 81. Estimated marginal means of *Self-reported comprehension* with the interaction effect between *Clip* and *Type of subtitle*

Clip	Type of subtitle	Mean	Std. Error
Clip 1	NP1	3.577	.196
	NP2	3.572	.186
	PRO	3.844	.184
Clip 2	NP1	3.726	.183
	NP2	3.289	.194
	PRO	3.794	.189
Clip 3	NP1	3.438	.200
	NP2	4.008	.192
	PRO	3.635	.204

Table 82. Pairwise contrasts of *Self-reported comprehension* with the interaction effect between *Clip* and *Type of subtitle* (*Clip* as reference factor)

Clip	Type of subtitle	Mean difference	Std. Error	t	df	p-value
Clip 1	NP1 – NP2	.005	.219	0.02	138	0.982
	NP2 – PRO	-.273	.211	-1.29	138	0.197
	PRO – NP1	.268	.216	1.24	138	0.217
Clip 2	NP1 – NP2	.437	.223	1.95	138	0.053
	NP2 - PRO	-.505	.219	-2.31	138	0.022*
	PRO - NP1	.069	.210	0.33	138	0.744
Clip 3	NP1 - NP2	-.570	.214	-2.67	138	0.009*
	NP2 - PRO	.373	.215	1.74	138	0.084
	PRO - NP1	.197	.220	0.90	138	0.371

* indicates significant results ($\alpha=0.05$)

Figure 40. Estimated marginal means of *Self-reported comprehension* with the interaction effect between *Clip* and *Type of subtitle*
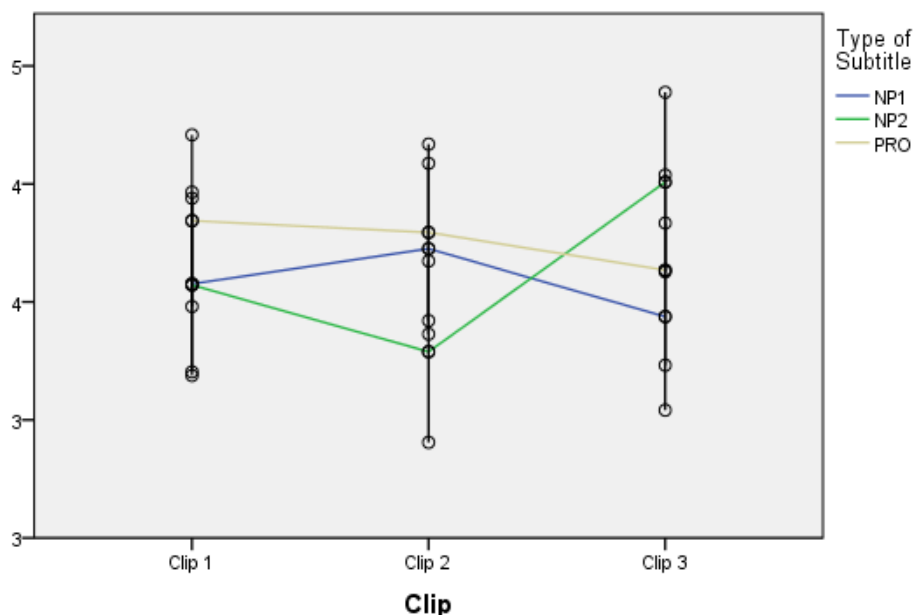
5.3.9.6. Self-reported comprehension - Summary

Here is a list of the conclusions that can be drawn from the analysis for *Self-reported comprehension*:

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- *Level of L2/L3* did not have an effect on self-reported comprehension, which is a rather counter-intuitive result.

- As expected, the participants who have already seen the clip reported a better comprehension of the clips.

- When looking at the self-reported comprehension ratings, HLE participants who *Never* use subtitles also had the best comprehension among all participants. There were no significant differences between the ratings given by the other participants.

- *Audience enjoyment* correlated with *Self-reported comprehension*: higher ratings for *Self-reported comprehension* coincide with higher ratings for enjoyment.

- Those participants who answered the narrative attention questions correctly also reported a higher comprehension of the content of the clip.

- Strangely, the lowest *Self-reported comprehension* mean rating for NP2 occurs in Clip 2. Among the mean self-reported comprehension scores of Clip 2, the mean of NP2 is significantly lower than the mean of PRO. On the other hand, in Clip 3 NP2 takes the first place and is significantly higher than NP1, which is in the lowest place.

5.3.10. Reception capacity

Reception was measured on a scale from 1 to 7, combining the results obtained from the questions concerning general comprehension, *Iconic attention*, *Narrative attention* and *Verbal attention* (these three variables are considered merely as a support for the *Reception capacity* variable and are explored individually in the subsequent sections). The model constructed for *Reception capacity* is shown in Table 83. Three variables were found to have a significant effect: *Clip* (F=6.66; p<0.01), *Type of subtitle* (F=5.85; p<0.01) and *Prior knowledge of the clips* (F=13.82; p<0.001). Once again, there was no significant effect for *Level of L2/L3*.

Table 83. Final model with significant main effects of *Reception capacity*

Predictor	F	Numerator df	Denominator df	p-value
Clip	6.66	2	150	0.002*
Subs	5.85	2	150	0.004*
Watched	13.82	1	150	<0.001*

* indicates significant results (α=0.05)

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5.3.10.1. Clip

The *Clip* variable was found to have a significant effect on *Reception capacity* (F=6.663; p<0.01). The estimated marginal means for the three clips are shown in Table 84. The highest mean score is 6.1 for Clip 1, and the lowest is 5.4 for Clip 2.

Table 84. Estimated marginal means of *Reception capacity* with the effect of *Clip*

Clip	Mean	Std. Error
Clip 1	6.139	.149
Clip 2	5.468	.148
Clip 3	5.633	.150

Table 85 shows the pairwise contrasts of the estimated marginal means. The mean for Clip 1 is significantly different from those of the other two clips. There is a 0.67-point difference between Clip 1 and Clip 2 (t=3.50; p<0.01) and the difference between Clip 1 and Clip 3 is 0.51 points (t=-2.64; p<0.01). A graphical representation of the means is included in Figure 41.

Figure 41. Estimated marginal means of *Reception capacity* with the effect of *Clip*
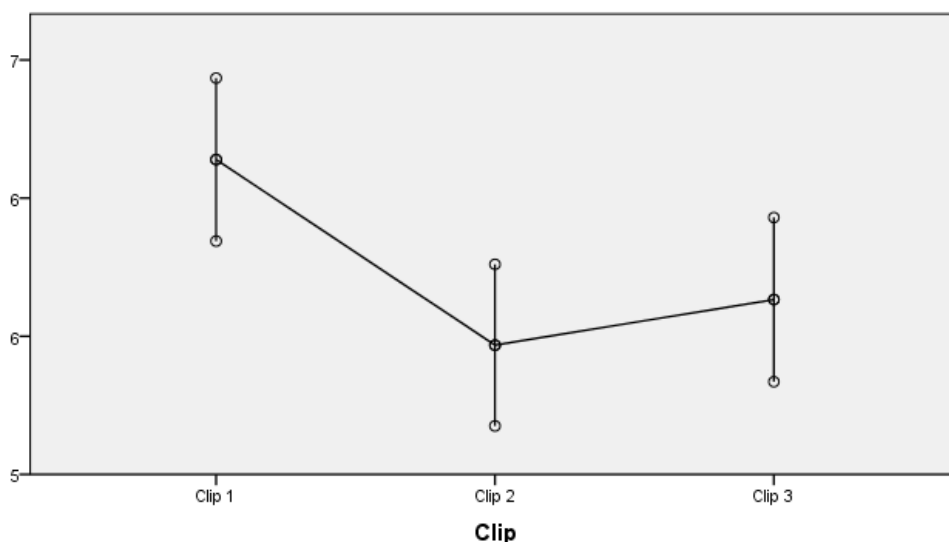
Table 85. Pairwise contrasts of estimated marginal means of *Reception capacity* with the effect of *Clip*

Clips	Mean difference	Std. Error	t	df	p-value
Clip 1 - Clip 2	.672	.192	3.50	150	0.001*
Clip 2 - Clip 3	-.165	.192	-0.86	150	0.392
Clip 3 - Clip 1	-.507	.192	-2.64	150	0.009*

* indicates significant results (α=0.05)

5.3.10.2. Type of subtitle

A significant effect was found for *Type of subtitle* on *Reception capacity* (F=5.85; p<0.01). The estimated means for each type of subtitle are shown in Table 86. The

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lowest mean is 5.37 points for the NP2 version, and the means for PRO and NP1 are very similar: 5.91 and 5.96 respectively.

Table 86. Estimated marginal means of *Reception capacity* with the effect of *Type of subtitle*

Type of subtitle	Mean	Std. Error
NP1	5.958	.153
NP2	5.367	.146
PRO	5.915	.149

Table 87 presents the pairwise comparisons of the mean reception capacity score for each type of subtitle. The results for NP2 are significantly different from the results for NP1 and PRO. There is a 0.59 difference between NP1 and NP2 (t=3.06; p<0.01), while the difference between NP2 and PRO is 0.549 (t=-2.86; p<0.01). Figure 42 shows a graphical representation of the means.

Figure 42. Estimated marginal means of *Reception capacity* with the effect of *Type of subtitle*
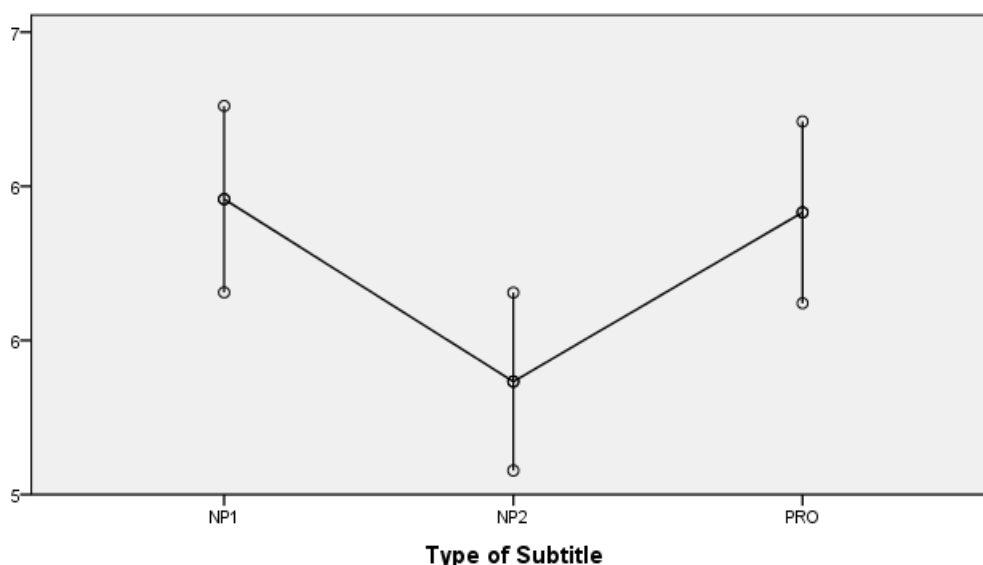
Table 87. Pairwise contrasts of *Reception capacity* with the effect of *Type of subtitle*

Type of subtitle	Mean difference	Std. Error	t	df	p-value
NP1 - NP2	.591	.193	3.06	150	0.003*
NP2 - PRO	-.549	.192	-2.86	150	0.005*
PRO - NP1	-.043	.192	-0.22	150	0.824

* indicates significant results (α=0.05)

5.3.10.3. Prior knowledge of the clips

Reception capacity scores are significantly affected by the participants' previous knowledge of the clips (F=13.81; p<0.001). Table 88 presents the mean reception

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capacity scores according to the participants' previous knowledge of the clips. The participants who had seen the clips before scored 6.1 on average, while those who watched the clip for the first time scored 5.4 (t=3.72; p<0.001).

Table 88. Estimated marginal means of *Reception capacity* with the effect of *Prior knowledge of the clips*

Watched	Mean	Std. Error
Yes	6.114	.170
No	5.379	.104

5.3.10.4. Reception capacity - Summary

The conclusions that can be drawn from the analysis of *Reception capacity* are summarized as follows:

- Surprisingly, unlike *Audience enjoyment, Reception capacity* was not dependent on *Level of L2/L3*.
- The understanding of the three clips varied: Clip 1 seems to be significantly easier to understand than the other two.
- *Reception capacity* is affected by *Type of subtitle*. The lowest mean reception capacity score is that of NP2, the Iberian non-professional version. There was no significant difference between the means of NP1 and PRO.
- The participants who had seen the clip before the experiment had a better reception capacity score.

5.3.11. Iconic attention

Given that *Iconic attention* (as well as the other two attention-specific questions) consists of two questions that were asked to the participants, it was treated as a variable with a binomial distribution using a generalized linear mixed model. Additionally, the percentage of fixations on the subtitle area was included as a covariate in the model because a significant main effect was detected. Only the *Clip* variable was found to have a significant effect on *Iconic attention* (F=23.35; p<0.001).

5.3.11.1. Clip

Table 89 shows the estimated means for *Iconic attention* with the effect of *Clip*. Clip 1 and Clip 3 show high scores, with averages of 86% and 84% of correct answers respectively. The average percentage of correct answers for Clip 2 is only 51%. Table 90 shows that the average correct answers for Clip 1 and Clip 3 are significantly

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different from the average of correct answers for Clip 2. This indicates that the participants answered only half of the *Iconic attention* questions of Clip 2 correctly.

Table 89. Estimated marginal means of *Iconic attention* with the effect of *Clip*

Clip	Mean	Std. Error
Clip 1	.856	.031
Clip 2	.519	.043
Clip 3	.837	.032

Table 90. Pairwise contrasts of estimated marginal means of *Iconic attention* with the effect of *Clip*

Clips	Mean difference	Std. Error	t	df	p-value
Clip 1 - Clip 2	.337	.052	6.48	153	<0.00001*
Clip 2 - Clip 3	-.317	.053	-6.00	153	<0.00001*
Clip 3 - Clip 1	-.019	.043	-0.44	153	0.658

* indicates significant results (α=0.05)

5.3.11.2. Iconic attention - Summary

The conclusions that can be drawn from the analysis for *Iconic attention* are summarized as follows:

- Neither *Level of L2/L3* nor *Type of subtitle* have a significant effect on *Iconic attention*.

- *Iconic attention* was affected by the *Clip* variable only. Clip 2 had a significantly lower score than the other two clips.

5.3.12. Narrative attention

The generalized linear mixed model constructed to test the significant effects and interactions on *Narrative attention* shows significant effects on *Prior knowledge of the clips* (F=5.10; p<0.05) and *Subtitle-reading effort* (F=2.78; p<0.05). The model also includes the significant effect of *Percentage of duration of fixations on the subtitle area* as a covariate (F=5.22; p<0.05).

5.3.12.1. Prior knowledge of the clips

The participants' previous knowledge of the clips had a significant effect on their answers to the *Narrative attention* questions. Table 91 shows the estimated means for the variable. The participants who had seen the clips before answered on average 84% of the questions correctly, while the participants who had not watched the clips before answered only 71% of them correctly. The difference of 12.6 points turned out to be significant (t=2.55; p<0.05).

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Table 91. Estimated marginal means of *Narrative attention* with the effect of *Prior knowledge of the clips*

Watched	Mean	Std. Error
Yes	.838	.043
No	.712	.034

5.3.12.2. Subtitle-reading effort

Subtitle-reading effort also had a significant effect on the participants' answers to the narrative attention questions (F=2.78; p<0.05). Table 92 shows the mean values for the variables. The participants who said the subtitles were easy to follow, with a score of 5, answered 88% of the questions correctly. The lowest percentage of correct answers is for participants who rated the subtitles with 4: only 68% of their answers were correct. Strangely, the participants who gave the subtitles a 3 answered 73% of the questions correctly, but participants who rated it with a 2 achieved 78% of correct answers. The pairwise comparisons are shown in Table 93. There are significant differences in the average percentage of right answers between the participants who rated the subtitles with 5 and those who gave the subtitles a 3 (t=-2.01; p<0.05), as well as between the participants who gave the subtitles a 4 and those who considered it was very easy to follow, with a 5 (t=-3.18; p<0.01).

Table 92. Estimated marginal means of *Narrative attention* with the effect of *Subtitle-reading effort*

Subtitle-reading effort	Mean	Std. Error
2	.785	.066
3	.735	.057
4	.682	.045
5	.883	.044

Table 93. Pairwise contrasts of estimated marginal means of *Narrative attention* with the effect of *Subtitle-reading effort*

Subtitle-reading effort	Mean difference	Std. Error	t	df	p-value
2 – 3	.050	.078	0.64	137	0.520
2 – 4	.102	.066	1.56	137	0.122
2 – 5	-.098	.078	-1.23	137	0.209
3 – 4	.052	.064	0.82	137	0.414
3 – 5	-.148	.074	-2.01	137	0.046*
4 – 5	-.200	.063	-3.18	137	0.002*

* indicates significant results (α=0.05)

5.3.12.3. Narrative attention - Summary

The main highlights resulting from the analysis of *Narrative attention* are summarized as follows:

- *Level of L2/L3* and *Type of subtitle* have no significant effect on *Narrative attention*.

- The participants who had seen the clip before the experiments answered more answers correctly than those who watched it for the first time.

- The participants who rated the subtitles as *very easy to follow* (5) also had a high *Narrative attention* score. Strangely, the lowest *Narrative attention* score is that of the participants who rated subtitle-reading difficulty at 4.

5.3.13. Verbal attention

As in the two previous cases, a generalized linear mixed model was created for *Verbal attention*. Significant effects were found on *Prior knowledge of the clips* (F=9.10; p<0.01), *Type of subtitle* (F=9.08; p<0.001) and *Clip* (F=5.83; p<0.01).

5.3.13.1. Prior knowledge of the clips

The participants' previous knowledge of the clips had a significant effect on their *Verbal attention* scores. The participants who had watched the clips before scored 96% of their answers correctly, while the participants who were watching the clips for the first time scored only 81% of them correctly. Thus, there was a mean difference of 15 points (t=4.15 p<0.0001).

Table 94. Estimated marginal means of *Verbal attention* with the effect of *Prior knowledge of the clips*

Watched	Mean	Std. Error
Yes	.964	.020
No	.813	.033

5.3.13.2. Type of subtitle

The types of subtitles had a significant effect on the scores for verbal attention (F=9.08; p<0.001). Table 95 shows the mean values that indicate that, after watching the videos with NP1 and PRO subtitles, the participants scored between 93.6% and 94.8% correct answers, while with NP2 they scored 84% of correct answers only. The pairwise comparisons in Table 96 present the significant differences between NP1 and NP2 (t=2.91; p<0.01) and between NP2 and PRO (t=-3.07; p<0.01).

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Table 95. Estimated marginal means of *Verbal attention* with the effect of *Type of subtitle*

Type of subtitle	Mean	Std. Error
NP1	.936	.024
NP2	.826	.047
PRO	.948	.021

Table 96. Pairwise contrasts of *Verbal attention* with the effect of *Type of subtitle*

Type of subtitle	Mean difference	Std. Error	t	df	Adj. Sig,
NP1 - NP2	.110	.038	2.91	150	0.004*
NP2 - PRO	-.121	.039	-3.07	150	0.003*
PRO - NP1	.011	.022	0.52	150	0.607

* indicates significant results (α=0.05)

5.3.13.3. Clip

The model for *Verbal attention* also found a significant effect of *Clip* (F=5.83; p<0.01). Table 97 shows the mean scores of *Verbal attention* with the effect of *Clip*. On average, the participants answered correctly 94.4% of the questions of Clip 2 and 93% of the questions of Clip 1, but only 85% of the questions of Clip 3. In both cases, the difference between Clip 3 and the other two clips is statistically significant (p<0.05).

Table 97. Estimated marginal means of *Verbal attention* with the effect of *Clip*

Clip	Mean	Std. Error
Clip 1	.930	.026
Clip 2	.944	.022
Clip 3	.850	.045

Table 98. Pairwise contrasts of *Verbal attention* with the effect of *Clip*

Clip	Mean difference	Std. Error	t	df	Adj. Sig,
Clip 1 - Clip 2	-.013	.023	-0.57	150	0.567
Clip 2 - Clip 3	.094	.037	2.55	150	0.012*
Clip 3 - Clip 1	-.081	.035	-2.29	150	0.023*

* indicates significant results (α=0.05)

5.3.13.4. Verbal attention - Summary

The analysis carried out to identify the main effects on *Verbal attention* has drawn the following main findings:

- *Level of L2/L3* has no significant effect on *Verbal attention*.
- The participants who had seen the clips before answered more questions correctly than the participants who watched the clips for the first time.
- NP2 subtitles, the Iberian non-professional subtitles, yielded significantly lower *Verbal attention* scores than the other two types of translation.

- The questions asking about verbal information were harder for Clip 3 than for the other two Clips.

5.3.14. Gender

One of the main concerns raised by the sample was the imbalance between men and women in the HLE group. While the LLE group comprised 14 women and 12 men, the HLE group was made of 21 women and 5 men. As mentioned in Section 4.3.1, this was mainly due to the gender imbalance among the students enrolled in the BA in English (25% men and 75% women). Half of the HLE participants came from this degree program. Considering this situation and in order to check for any possible effect, the *Gender* variable was included in all the models in the initial stages as part of the variable selection process. However, it did not produce a significant effect on any of the variables.

5.4.   Quantitative analysis summary

Table 99 below presents a summary of the main effects and interactions found in the statistical analyses. The *Type of subtitle* variable was found to have a significant effect on *Mean fixation duration on the image and the subtitle area* and *Attention shift ratio*. Mean fixation durations were shorter with the PRO version of the subtitles. *Type of subtitle* also had an impact on *Reception capacity*, caused mainly by *Verbal attention*. The participants had significantly lower scores with one of the non-professional subtitle versions.

Level of L2/L3 was found to produce significant effects on all eye-tracking measurements except *Mean fixation duration on the subtitle area.* HLE participants made fewer fixations and looked at the subtitle area for a shorter time. They also skipped more subtitles, thus shifting less between the image and the subtitle areas. Further, their fixations on the image area were significantly longer. Among the self-reported variables, significant effects were found only for *Audience enjoyment*: the HLE participants' scores for *Audience enjoyment* were higher than the scores given by LLE participants. Interestingly, no significant effects were found for *Reception capacity* or the different types of attention questions. The differences in behavior that were found to

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be dependent on the participants' level of proficiency in the source language are covered in Section 6.2.1.

Audience enjoyment also correlated with *Subtitle-reading effort*: the participants who said they enjoyed the clip also claimed the subtitles were easier to follow. The results indicate that the participants regular *Use of subtitling* is one of the most important factors determining their behavior. Significant effects of *Use of subtitling* were found for all eye-tracking variables, except for *Mean fixation duration on the image area*. The group of participants who *Never* use subtitles, made up entirely of participants with a HLE, was found to exhibit a behavior different from all other participants. The significant effect found for *Use of subtitling* is explained in detail and supported with interview data in Section 6.2.4. Significant effects were also found for the *Clip* variable, mainly due to a higher cognitive load caused by Clip 2. The unexpected effects for Clips are revised in Section 6.2.3.

Table 99. Summary of dependent variables with main effects and interactions marked as ×

Main effects and interactions	Total fixation duration on the subtitle area	Percentage of fixations on the subtitle area	Skipped subtitles	Mean fixation duration on the subtitle area	Mean fixation duration on the image area	Attention shift ratio	Subtitle-reading effort	Audience enjoyment	Self-reported comprehension	Reception capacity	Iconic attention	Narrative attention	Verbal attention
Types of Subtitles				×	×	×				×			×
Level of L2/L3	×	×	×		×	×		×					
Use of subtitling	×	×	×	×		×	×		×				
Narrative attention									×				
Subtitle-reading effort								×				×	
Audience enjoyment									×				
Clips		×				×		×		×	×		×
Order of presentation		×											
Prior knowledge of the clips							×		×	×		×	×
Level of L2/L3 and Use of subtitling	×												
Level of L2/L3 and Prior knowledge of the clips		×											
Clip and Type of subtitle				×	×	×			×				

Chapter 6. Qualitative data and discussion

In the previous chapter I described the quantitative data collected for this study and the results obtained from the statistical analysis. In this chapter I use those results to test the hypotheses defined in Section 4.1. The results from the hypothesis testing are covered in Section 6.1. In Section 6.2 I draw on the eye-tracking and interview data to illustrate some additional relevant findings of the study. This section will go deeper into specific cases encountered during the analysis that proved to provide interesting insights into the participants' behavior and to complement the picture of professional and non-professional subtitling consumption. In Section 6.3 I turn to qualitative data to explain the extent of the control the participants have over their experience as users. In this section I comment on the participants' access to audiovisual content and their use of different kinds of audiovisual translation.[4]

6.1. Hypothesis testing

6.1.1. Hypothesis 1: Type of subtitle

The first hypothesis (H_1) posits that participants' comprehension scores will be higher with professional rather than non-professional subtitles.

This hypothesis is grounded on the fact that non-professional subtitling is commonly deemed to be low-quality translation that cannot be compared with professional subtitling (Dwyer and Uricaru 2009; La Forgia and Tonin 2009; Bogucki 2009). The hypothesis assumes that the differences in production conditions and quality between professional and non-professional subtitles will have an effect on the participants' reading behavior and understanding of the audiovisual content.

Bearing in mind the different levels of reception on which professional and non-professional subtitles can be compared and contrasted, I formulated seven sub-hypotheses. In the following subsections I address each of these sub-hypotheses and then present the global results for H_1.

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[4] Segments of the qualitative analysis that are included here reproduce a section published in Orrego-Carmona (2014a).

6.1.1.1. $H_{1.1}$: Reception capacity is higher with professional subtitles.

The *Type of subtitle* variable was determined to have a significant main effect on *Reception capacity* (F=5.85; p<0.01). Nevertheless, the hypothesis is only partially confirmed. The mean reception capacity with PRO was higher than the mean reception capacity with NP2 (PRO=5.91 vs. NP2=5.37. t=-2.857; p<0.01); however, it was not significantly higher than NP1, which had a mean of 5.96 (t=-0.22; p=0.82).

The results present a counterintuitive finding. NP1 was produced by a non-professional Latin-American subtitling community translating into neutral Spanish, while NP2 was produced in Spain by a community that uses Iberian Spanish. By reading the subtitles, it is possible to tell the geographical provenances, although the participants did not point this out during the interviews. There are two aspects that can be inferred from these results. First, since the results for NP1 and PRO were not significantly different, it is possible to assume that these versions are simply clearer to understand than NP2. Second, since the PRO version, which is also localized for the Spanish market, produced higher scores than NP2, it could be argued that localization in general is not what causes the lower scores. Rather, it could be the case that NP2 subtitles are somehow less accomplished than the other two and fail to convey the message as effectively.

Reception capacity is in turn a variable composed of another set of variables: *Iconic*, *Narrative* and *Verbal attention*. Among these variables, *Type of subtitle* has a significant effect on *Verbal attention* (F=9.076; p<0.001). The same effect found on *Reception capacity* is found here. When the participants answered the *Verbal attention* questions after watching the PRO version, they answered them correctly in 94.8% of the cases. In the case of NP1, they provided the correct answer in 93.6% of cases. However, with NP2, they answered only 82.6% of the questions correctly, which is significantly lower than the other two.

6.1.1.2. $H_{1.2}$: Subtitle-reading effort is lower with professional subtitles.

Type of subtitle was not determined to have a significant main effect on *Subtitle-reading effort* (F=0.60; p=0.55). The findings thus do not confirm this hypothesis. However, an interaction effect between *Clip* and *Type of subtitle* was identified (F=3.10; p<0.05).

A similar pattern to the one found in *Reception capacity* was found for this variable. NP1 did not differ significantly from the other two subtitles. When comparing the differences between PRO (4.32) and NP2 (3.57), it can be seen that, in Clip 1, the

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mean score for PRO is 0.75 points higher than the score for NP2 (p<0.01), but the case is reversed for Clip 3, in which the score for NP2 (4.25) is 0.65 points higher than the score for PRO (3.59).

When the clips are taken as reference factor, the best score for NP2 is found in Clip 3, which is approximately 0.6 points higher than the score for NP2 in the other two clips. The only additional significant difference is present in PRO. The score PRO receives in Clip 3 is 0.72 points lower than the score it receives in Clip 1. These results seem to indicate the importance of the audiovisual material in the study. The design of the study aimed to select videos that were comparable. Nevertheless, given the complex nature of audiovisual content, it is only natural that there are effects produced by the clip. I will address these issues in an all-inclusive analysis of the audiovisual material in Section 6.2.3.

6.1.1.3. $H_{1.3}$: *Self-reported comprehension is greater with professional subtitles.*

This hypothesis is based on the rationale that viewers can identify bad quality translation or at least notice the different degrees of assistance that various types of subtitles offer. The findings from the statistical model do not provide evidence to confirm this hypothesis, since no significant main effect of *Type of subtitle* on *Self-reported comprehension* was found (F=1.54; p=0.21).

Similarly to *Subtitle-reading effort*, there was a significant effect of the interaction between *Clip* and *Type of subtitle* (F=2.92; p<0.05). However, the results scarcely follow an identifiable pattern. There are two pairwise comparisons that show significant differences and both of them involve NP2. In Clip 2, there is a significant difference between NP2 and PRO (t=-2.31; p<0.05), with the PRO version receiving 0.5 more points on average than NP2. On the contrary, in Clip 3, the ratings for NP2 are 0.57 points higher than those for NP1 (t=-2.67; p<0.01).

As a general conclusion on this hypothesis, it could be assumed that the type of subtitles did not influence the participants' rating for their self-reported comprehension. Other factors, such as their reported enjoyment, their use of subtitles and, intuitively, their *Prior knowledge of the clips* were determined to be significant effects of *Self-reported comprehension*. However, self-reported measurements are known to be troublesome due to the possibility that participants overestimate their understanding of the audiovisual translated content (Antonini 2005; Bucaria and Chiaro 2007; Antonini

2008) or underestimate their declared understanding of the content, as shown in Caffrey (2009).

6.1.1.4. H$_{1.4}$: With professional subtitles, more attention is allocated to the image area.

As explained in Section 5.3.2.3, *Percentage of fixations* and *Total fixation duration* on the image and on the subtitle areas are complementary and the statistical models produce the same results. To test this hypothesis, I use the time during which participants' visual attention is allocated to the subtitle area, located at the bottom of the screen. Based on the eye-tracking data, this hypothesis cannot be confirmed. *Total fixation duration on the subtitle area* was not significantly shorter for the professional subtitles. Similarly, the *Percentage of fixations on the subtitle area* was not significantly shorter for the professional subtitles either. In the HLE group, the mean percentage of fixations on the subtitle area was 46% in the PRO version, 43% in the NP1 version and 44% in the NP2 version. Among LLE participants, the mean percentage of fixations on the subtitle area for PRO was 61%, while the NP1 and the NP2 had mean percentages of 62% and 64% respectively.

By comparing the three subtitle conditions, I tested whether any of them demanded a higher percentage of attention allocation. Had the results shown that the differences between the means were significant, this would have indicated that a given set of subtitles was more cognitively demanding than the other subtitles. When watching subtitled audiovisual products, subtitles have to compete for the attention against the other sources of information: sound and image. Both the acoustic and visual channels can offer verbal and non-verbal information; like those two channels, the subtitles also demand a large share of the cognitive resources from viewers. The amount of attention that viewers have to allocate to the subtitles in relation to the other sources of information is considered an indicator of the cognitive effort they entail. Whenever some subtitles demand more time or require a higher number of fixations than others, it can be assumed that those subtitles are more cognitively demanding (Saldanha and O'Brien 2013; Kruger et al. 2015).

6.1.1.5. H$_{1.5}$: Mean fixation duration is shorter with professional subtitles.

As in the previous case, the hypothesis stated that the professional subtitles would have shorter mean fixations than the non-professional subtitles. According to the results presented in Section 5.3.4, this hypothesis is confirmed. The main effect of *Type of*

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subtitle (F=26.97; p<0.001) and the interaction between *Clip* and *Type of subtitle* (F=5.83; p<0.01) are significant for *Mean fixation duration on the subtitle area*. Additionally, *Type of subtitle* was found to have a significant main effect on *Mean fixation duration on the image area* (F=5.52; p<0.01).

The results indicate that the mean on the PRO version (178.41 ms) is significantly shorter than the mean fixations on both NP1 and NP2 subtitles (196.69 ms and 201.84 ms). *Mean fixation duration* is commonly regarded as an indicator of cognitive effort (d'Ydewalle and Bruycker 2007; Perego et al. 2010; Kruger et al. 2015) not only in studies within Translation Studies but also in reading studies. Rayner and Pollatsek (2006) argue that reading studies have provided solid evidence to accept that longer fixations on words are associated with higher difficulty to understand them.

The mean fixation duration estimated with the effect of *Type of subtitle* concords with the mean fixation duration on subtitles reported by d'Ydewalle and Bruycker (2007) for adult viewers watching subtitled material: 178 ms for one liners and 179 ms for two liners. Kruger et al. (2015) reported a mean fixation of 186.55 ms among hearing viewers watching subtitles presented at a speed of 12 characters per second, which is a faster speed than the speed of all the subtitles included in this study. Interestingly enough, the mean fixations reported in other studies are still longer than the means I found for the non-professional subtitles in my experiment. The mean fixation reported by Caffrey (2009:163) is 237 ms for one-line subtitles and 201.43 ms for two-line subtitles. Perego et al. (2010:259) found a 221-ms mean fixation while Künzli and Ehrensberger-Dow (2011) reported a mean of 0.36 seconds. Among all the studies above, only d'Ydewalle and Bruycker (2007) and Künzli and Ehrensberger-Dow (2011) include participants who are supposed to be used to subtitling, since this is the most widely used audiovisual translation modality in Flemish-speaking Belgium and German-speaking Switzerland (Media Consulting Group 2011). On the other hand, Perego et al. (2010) present an experiment carried out in Italy, primarily a dubbing country, so their results should be more similar to mine. Although the mean fixations on the non-professional versions in my study are very similar to theirs, the mean fixation in the PRO version is shorter.

A more detailed analysis can be based on the interaction between *Type of subtitle* and *Clip*. It shows that PRO differs significantly from the other types of subtitles only in the first two clips and not in the third. This could indicate that participants become used to the subtitles over time or their behavior stabilizes as a result of immersion in the

whole viewing experience. However, it could also be a clip-influenced effect. With only three short clips in this experiment, it is impossible to test this any further.

The findings from the variable *Mean fixation duration on the subtitle area* seem to support the connection between mean fixation duration on the subtitles and cognitive effort. When taking the types of subtitles as reference factor, Clip 2 differs significantly from Clip 3 in the NP1 version and from the other two clips in the PRO version. The tests of *Reception capacity*, *Iconic attention* and *Attention shift ratio* show the participants' efficiency with Clip 2 was lower than with the other two. This hints at greater difficulty to understand Clip 2, which causes a lower-level performance. Given the possibilities this discussion offers, I will address it in a holistic manner in Section 6.2.3.

Interestingly, *Type of subtitle* also influenced the mean fixation on the image area. Again, the shortest mean fixation was found in PRO (333.55 ms), which is significantly different from the mean fixation duration on the image for NP1, 357 ms. NP2 had an estimated mean fixation of 346.59 ms and is not significantly different from any of the other two means. The fact that subtitles affect the visualization process as a whole has already been shown in previous research. In one study, Bairstow (2011) found that for the participants who relied on the subtitles (monolingual participants who did not understand the original language), the subtitles acted as a facilitating factor for the understanding of visual information. Instead of obtaining lower scores on the visual attention questions due to the amount of time dedicated to the subtitle area, the participants who relied on the subtitles obtained higher scores on visual information perception than the bilingual participants who were assumed to focus more on the image (Bairstow 2011). However, the fact that different types of subtitling affect the viewing process in different ways highlights the importance of the subtitles. Since other eye-tracking measurements are not affected by *Type of subtitle*, I suspect this difference in mean fixation duration is more related to the format of the subtitles and their appearance on the screen. I comment on this in Section 6.2.5.

6.1.1.6. H₁.₆: *Fewer subtitles are skipped when participants are watching professional subtitles.*

The results did not provide any evidence to confirm this hypothesis. No significant effect for *Type of subtitle* ($F=2.49$; $p=0.087$) was found on *Skipped subtitles*. Subtitle speed imposes a cognitive demand on viewers. If the subtitles are too fast, it is more

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likely that more subtitles will not be fixated upon. However, the subtitles included in this study did not vary much in terms of subtitle speed. The PRO version has an average speed of 10.7 characters per second, while the NP1 and NP2 version are presented at 10.1 characters per second and 10.9 characters per second on average.

6.1.1.7. $H_{1.7}$: Attention shift varies depending on type of subtitle.

Attention shifts are calculated per subtitle and indicate the number of times the viewer's gaze shifts from the image to the subtitles and from the subtitles to the image. *Type of subtitle* was found to produce a significant effect on *Attention shift ratio* (F=7.32; p<0.01). The hypothesis is stated without any direction because the increase or decrease of attention shifts does not necessarily mean the reading process is smoother.

The mean attention shift for the PRO version was 2.01 and was significantly higher than for the other two. The means for the non-professional versions were 1.88 for NP1 and 1.81 for NP2. Attention shifts should be understood on the premise that, in a linear reading behavior, each subtitle should cause two attention shifts: one shift in which the gaze moves from the image to the subtitle area and another one from the subtitle area to the image.

Kruger et al. claim that "the fewer the gaze shifts, the more fluent the reading and vice versa" (2015:n.p.). However this is not necessarily the only possibility. Assuming subtitles provide viewers with necessary time to read the subtitle and check the image, there should always be a minimum number of attention shifts required to achieve that goal: two shifts per subtitle. A higher ratio could indicate re-reading, which is normally taken as a sign of greater difficulty in reading (Krejtz et al. 2013). On the other hand, lower scores could imply a large amount of *Skipped subtitles*.

Yet another element should be considered. The *Code of Good Subtitling Practice* (Carroll and Ivarsson 1998) states that a minimum of four frames should be left between subtitles in order to allow the eyes of the viewer to recognize there is a new subtitle on the screen. In the PRO subtitles used in this experiment, the minimum time left between two given subtitles was 160 ms. This spotting is probably a guideline from the studio and might have been controlled by the use of templates, as confirmed by private communication with a translator who has participated in the translation of *The Big Bang Theory* for Spain (Warner Bros 2010). However, this rule was not followed by the non-professional subtitling communities included in this study. For instance, the median for the time between one subtitle and the next was found to be as short as 20 ms for NP1 in

Clip 2, including many instances of only 10 ms between subtitles. This indicates that subtitles virtually overlap to the human eye. Viewers who become aware of the change can read the second overlapping subtitle without going back to the image area, thus reducing the number of shifts and causing them to remain on the subtitle area for longer periods of time.

Under these conditions, even if the number of attention shifts is low, the subtitles are disturbing the regular process of simultaneously checking the image and the subtitles, which affects the behavior of participants. Figure 43 shows an 8.6-second representation of the gaze path of five LLE participants. The representation extends over three subtitles, but given the little time span between subtitles, some of the participants do not look at the image until they have read the very last subtitle. Only one participant makes six attention shifts, and another two make two attention shifts. In this scenario, it could be said that the PRO version, with an average attention shift ratio of 2.01, is a better indicator of a more homogeneous behavior in which participants start reading the subtitles and "glance at the video action after they finish reading" (Jensema et al. 2000b:284).

Figure 43. Example of attention shifts when subtitles overlap
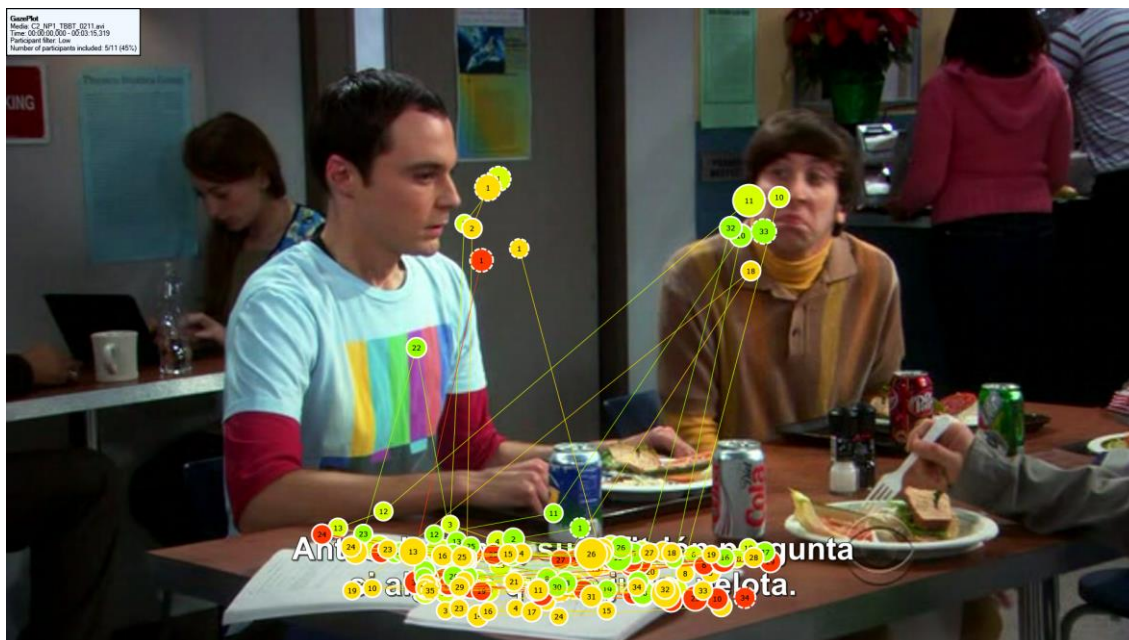
6.1.1.8. Conclusion on H_1: Type of subtitle

The results for H_1 and its sub-hypotheses are summarized in Table 100. The data do not provide enough evidence to confirm H_1. Only two of the seven postulated sub-

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hypotheses are confirmed: 1) The PRO version resulted in shorter mean fixation duration on both the subtitle and the image areas, and 2) the ratio of attention shifts varied depending on the subtitles. In fact, the attention shift ratio indicates that, on average, professional subtitles allow participants to have a more regular reading behavior.

The other eye-tracking measurements, the *Attention allocation* and the percentage of *Skipped subtitles*, did not provide evidence that the reception scores were higher for the professional version. Further, the self-reported measurements related to *Subtitle-reading effort* and *Comprehension* did not have a significant effect of *Type of subtitle* and seem to be more affected by the nature of the audiovisual material. Perhaps the most surprising finding is that *Reception capacity* was affected by *Type of subtitle* but only one of the non-professional subtitle versions, the Iberian Spanish one, was significantly different from the professional version. The other non-professional version, the Latin-American one, which is supposed to be formulated in neutral Spanish, obtained results that are not significantly different from the professional version.

Table 100. Summary of the hypothesis testing for H_1

Hypothesis	Variable		Confirmation
$H_{1.1}$	Reception capacity	(✓)	This hypothesis is only partially confirmed. The *Reception capacity* scores for the PRO version are higher than NP1, but they were not significantly different from NP2. The effect seems to be driven by the significant differences in the *Verbal attention* questions.
$H_{1.2}$	Subtitle-reading effort	✗	*Type of subtitle* does not have a significant effect on *Subtitle-reading effort*. Differences can be observed in the results from the interaction between *Clip* and *Type of subtitle*, but they do not follow a pattern.
$H_{1.3}$	Self-reported comprehension	✗	The analyses did not find a significant effect of *Type of subtitle* on self-reported comprehension.
$H_{1.4}$	Attention allocation	✗	Participants' *Total fixation duration* and *Percentages of fixation duration on the subtitle area* are not lower with the professional subtitles.
$H_{1.5}$	Mean fixation duration	✓	*Mean fixation durations* are longer for the non-professional subtitle versions. *Mean fixation durations on the image* are also found to be shorter in the PRO version.
$H_{1.6}$	Skipped subtitles	✗	All subtitles have very similar speed and the results do not indicate a significant effect for Type of subtitle on the percentage of *Skipped subtitles*.
$H_{1.7}$	Attention shifts	✓	The average number of *Attention shifts* with the PRO version is higher, which could be an indicator of a more homogeneous viewing process in which the participants are able to continuously shift between the image and the subtitles.

It cannot be said that viewers achieve higher comprehension with the professional subtitles used in this study. However, the findings suggest there is an impact of the subtitle spotting and their layout on the eye-tracking measurements that benefits professional subtitling.

6.1.2. Hypothesis 2: Level of L2/L3

The second hypothesis (H_2) for my study thus states: Participants with a high level of proficiency in L2/L3 will be less dependent on subtitles than will participants with a low level of L2/L3. It finds its grounding in previous studies (Lavaur and Nava 2008; Lavaur and Bairstow 2011; Bairstow and Lavaur 2012) that comment on the distracting effect that subtitles could have on viewers who have a high level of proficiency in the source language. Likewise, these studies, like most studies on eye-tracking and subtitling, are based on d'Ydewalle and colleagues' conclusions about the almost automatic task of reading subtitles (d'Ydewalle and Gielen 1992; d'Ydewalle and Bruycker 2007).

In order to test this hypothesis, I postulated three sub-hypotheses exploring the relation between *Attention allocation*, *Mean fixation duration* and *Audience enjoyment*.

6.1.2.1. $H_{2.8}$: Participants with a high level of L2/L3 allocate less attention to the subtitle area.

Attention allocation is tested through two variables: *Total fixation duration on the subtitle area* and *Percentage of fixations on the subtitle area*. In both cases the results show that *Level of L2/L3* has a significant effect on these variables, thereby confirming the hypothesis.

The difference between *Total fixation duration on the subtitle area* is highly significant (p<0.0001). The estimated mean for the HLE participants is shorter than the estimated mean for LLE participants (t=5.60, p<0.001). When it comes to *Percentage of fixations on the subtitle area*, there is a 15.7-point difference between the estimated means of the two groups (t=3.50; p<0.05). HLE participants made 43.3% of the fixations on the subtitles, while the participants in the LLE group made 59% of the fixations on the same area.

In terms of the *Percentage of duration of fixations on the subtitle area*, HLE participants spent 32% of their time looking at the subtitles, while LLE did so for 51% of the time. The mean fixation percentages of time spent on the subtitle area for the two

groups are similar to other percentages reported by previous researchers. Among studies that report the percentage of time participants allocate to the subtitle there nevertheless tends to be considerable variation. d'Ydewalle and Bruycker (2007) report a mean percentage of 31% when adults were reading one-line subtitles, and 37% when they were reading two-line subtitles. Caffrey (2009) reports that participants spent 42% of the time on the subtitle area for one-liners and 56% for two-liners. Perego et al. (2010) found that participants spent 67% of the time looking at the subtitles. The lowest percentage is 31.5%, under mainstream subtitle circumstances, reported by Künzli and Ehrensberger-Dow (2011).

6.1.2.2. $H_{2.9}$: Mean fixation duration varies depending on the level of L2/L3.

Mean fixation durations were processed and tested independently for the image area and the subtitle area. *Level of L2/L3* was included in the model for *Mean fixation duration on the subtitle area* at the initial stage of the model construction, but no significant effect was found and, since it was affecting the results for other variables, it was removed from the final model. Based on the results for the subtitle area, there is no evidence to confirm this hypothesis.

On the other hand, when running the model for *Mean fixation duration on the image area*, the effect of *Level of L2/L3* was found to be significant. There is a 98.6 ms difference between the estimated means for the HLE group, 395 ms, and the LLE, 296 ms (t=4.49, p<0.0001). Interestingly enough, it is the mean fixation duration on the image that varies depending on *Level of L2/L3*, thus partially confirming the hypothesis. The fixations of the participants in the HLE group who dedicate less time to reading the subtitles become longer. Since their attention does not change focus as much as the attention of LLE participants does, they have a smoother viewing process, which is more centered on the image.

6.1.2.3. $H_{2.10}$: Audience enjoyment is higher for participants with a high level of proficiency in L2/L3.

The results show that there is a significant main effect of *Level of L2/L3* on *Audience enjoyment*, thus confirming this hypothesis. The estimated mean for perceived audience enjoyment among HLE participants was 2.85 points, while the mean among LLE participants was 2.49 points (t=2.68; p<0.01).

The interest of these results stems from the fact that HLE participants spend less time on the subtitle area, which might mean that depending more on the subtitles could decrease viewer's enjoyment of content. Actually, during the interviews, it became evident that most participants considered subtitling to be a necessary evil: they recognize that they need them and also granted them an added value in terms of language learning, but they affirm that subtitles have the downside of being more cognitively demanding and tiring than dubbing (see Section 6.3.2).

There could be yet another reason for the lower ratings among LLE participants. Bucaria and Chiaro (2007) found that Italian viewers rated translated foreign material as less entertaining than locally produced content. This situation is, to some extent, similar to the effect of higher proficiency in the foreign language and enjoyment. If we assume that a higher level of proficiency in the source language also implies a closer relation with the source culture, then the participants in the HLE group could identify more with the TV series and the culture it represents. They find the content more entertaining than do participants in the LLE group, who have to allocate a considerable proportion of their cognitive resources to following the subtitles and understanding the content in order to connect with the culture.

6.1.2.4. Conclusion on H_2: Level of L2/L3

In the case of H_2, as shown in Table 101, all three sub-hypotheses were confirmed, thus confirming the main hypothesis. According to the data collected, the participants behave differently depending on their level of proficiency in the source language of the content. Viewers with a low level of proficiency in the language have to follow the subtitles more closely, as expected. The viewers who are more proficient in the language follow a less linear and more independent reading process, since they do not fully rely on the subtitles (see Section 6.2.1).

Interestingly, the results also indicate that a higher reliance on the subtitles is correlated with a lower feeling of enjoyment. The scores of viewers who spent more time on the subtitles coincide with lower average enjoyment than do the scores of the highly proficient viewers.

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Table 101. Summary of the hypothesis testing for H_2

Hypothesis	Variable	Confirmation	
$H_{2.8}$	Attention allocation	✓	Participants who have a high *Level of L2/L3* fixate less and for shorter periods of time on the subtitle area than do participants with a low *Level of L2/L3*.
$H_{2.9}$	Mean fixation duration	(✓)	This sub-hypothesis is partially confirmed. No significant effect for *Level of L2/L3* on *Mean fixation duration on the subtitle area* was found, but there is a significant difference in the *Mean fixation duration on the image area* depending on the participants' knowledge of the source language.
$H_{2.10}$	Audience enjoyment	✓	The scores of participants in the HLE group indicate they enjoy the content more than participants in the LLE group did.

6.1.3. Hypothesis 3: Type of non-professional subtitles

The wide range of non-professional subtitling activities results in products with a high degree of variation between them. In view of this, in this study I decided to include two versions of non-professional subtitles in order to explore the differences between them, as well as how they compare with professional subtitling.

The hypothesis for the comparison between the two non-professional subtitles was: Participants' reception scores will be higher with the non-professional subtitles produced in Spain (their own country) than with the non-professional subtitles produced in Latin America.

The phrasing of this hypothesis is guided by the fact that the subtitles produced in Spain (NP2) use the regional variety of the language and are intended specifically for the Spanish audience. The other set of subtitles (NP1) was created by a Latin-American non-professional subtitling community that started in Argentina and translates into "neutral" Spanish. I formulated three sub-hypotheses for assessing the effect of the types of non-professional subtitles. These hypotheses involve the variables *Reception capacity*, *Subtitle-reading effort* and *Self-reported comprehension*. All three are related to Gambier's second R, *responses* at the perceptual level, and assess the participants' performance and perception about the subtitles.

6.1.3.1. $H_{3.11}$: Reception capacity is higher with NP2.

As shown in Section 6.1.1.1, *Type of subtitle* was found to have a significant main effect on *Reception capacity*. The estimated mean for *Reception capacity* with NP1 was 5.96, while the mean for NP2 was 5.37. The difference between the two types of non-

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professional subtitling is significant, but the estimated mean is higher for NP1, thus providing evidence to reject the hypothesis.

As commented in the test for $H_{1.5}$ in Section 6.1.1.1, the fact that the results indicate a higher average *Reception capacity* with the neutral Spanish version comes as a surprise. The differences between the two versions of non-professional Spanish subtitles are not difficult to spot for Spanish speakers, but the participants did not even comment on this difference during the interviews.

Since the PRO version achieved scores similar to NP1, probably the difference in scores is not necessarily an effect of NP1 having a more standard version of the subtitles but rather is due to the specificities of the subtitles themselves. In that sense, the scores for *Reception capacity* help establish a ranking of the translations and serve as an indicator of quality. The inclusion of three different sets of subtitles in the experiment and the fact that two of them gave similar results allow us to assume that the poorer performance of the participants when they watched the audiovisual content with NP2 could be due to the quality of the subtitles. This is supported by the fact that, among the types of attention (*Verbal*, *Iconic* and *Narrative*) that comprise *Reception capacity*, only *Verbal attention* has a significant main effect on *Type of subtitle*. The participants had 82.6% of their questions right when watching the videos with NP2. However, this percentage was 93.6% with NP1, which stands closer to the 94.8% of correct answers obtained with the PRO versions.

6.1.3.2. $H_{3.12}$: *Subtitle-reading effort is lower with NP2.*

As explained in $H_{1.6}$ in Section 6.1.1.2, no significant effect of *Type of subtitle* was found on *Subtitle-reading effort*. This means that the ratings the participants gave to the difficulty they had were not affected by *Type of subtitle*. Thus this hypothesis cannot be confirmed. The interaction between *Clip* and *Type of subtitle* was significant (F=3.10; p<0.05), which indicates that the combined effect of *Clip* and *Type of subtitle* affects the perceived difficulty to follow the content. In the analysis of the results it is possible to appreciate that, while in Clip 1 and Clip 3 there is more variation in the scores for subtitle-reading difficulty, the scores for Clip 2 are closer together. This, combined with the effect of the *Clip* variable on other dependent variables, seems to indicate that Clip 2 was more difficult to understand than the other clips (see Section 6.2.3). Further, the pairwise comparisons for *Type of subtitle* taking *Clip* as reference factor did not yield

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significant results for the differences between NP1 and NP2 in the three clips. Significant differences only occur between PRO and NP2.

6.1.3.3. $H_{3.13}$: *Self-reported comprehension is greater for NP2.*

No significant effect for *Type of subtitle* was found in the model constructed for *Self-reported comprehension*. This indicates that *Type of subtitle* did not influence the perceived understanding of the content. Based on this, the data do not provide any support for the hypothesis.

On the other hand, the interaction between *Clip* and *Type of subtitle* was found to be significant for this variable (F=2.92; p<0.05). However, when taking *Clip* as reference factor, the only instance in which there was a significant difference between the two non-professional versions was Clip 3. The estimated mean score for NP2 in Clip 3 was 4.01, while the estimated mean score for NP1 was 3.44. In the other two instances, i.e. Clip 1 and Clip 2, there was no significant difference between the two non-professional versions.

6.1.3.4. *Conclusion on H_3: Type of non-professional subtitling*

As shown in the summary in Table 102, the results from the analysis of the sub-hypotheses do not allow for a confirmation of H3. The findings show that NP2, the Iberian Spanish non-professional version, gave lower results than the Latin-American version in terms of *Reception capacity*. The results of NP1 are in fact similar to those of the professional subtitle version. Additionally, *Type of subtitle* did not have an effect on the self-reported measurements assessing comprehension and *Subtitle-reading effort*.

Table 102. Summary of the hypothesis testing for H_3

Hypothesis	Variable		Confirmation
$H_{3.11}$	Reception capacity	✘	Participants have higher *reception capacity* with the Latin-American version.
$H_{3.12}$	Subtitle-reading effort	✘	There is no variation in the scores for *Subtitle-reading effort* resulting from the effect of *Type of subtitle*.
$H_{3.13}$	Self-reported comprehension	✘	The scores for *Self-reported comprehension* are not significantly different for the two types of subtitle.

6.1.4. *Hypotheses based on qualitative data*

Two additional hypotheses were postulated regarding the participants' opinions about the non-professional subtitles included in the study. It should be recalled that the participants were not told about the production conditions of the subtitles until the end

of the experiment. Only at the end of the interview were they informed about the differences between the subtitles.

6.1.4.1. H₁₄: Participants will be more positively inclined towards the professional rather than non-professional subtitles.

During the interview session, some of the participants commented on the fact that they use non-professional subtitles, but no one hinted at the possibility that the subtitles included in the experiment were taken from Internet communities or were done by non-professional subtitlers. When asked if they had noticed any difference between them, sometimes participants commented on spelling mistakes or on the appearance of the subtitles (see Section 6.2.5), but not on the provenance or production conditions of the subtitles. Given that the participants did not comment on this issue, there is not enough information to confirm this hypothesis.

6.1.4.2. H₁₅: Participants will be more positively inclined towards the Iberian rather than Latin-American subtitles.

As mentioned in the previous hypothesis, when the participants were asked if they noticed any difference between the subtitles, they did not mention any difference related to the provenance of the subtitles. With the material collected during the interviews, it was not possible to support this hypothesis. Some of the participants did mention that there are normally Iberian and Latin-American versions of the subtitles on the Internet and that sometimes it is annoying because they have to make sure which one is available. Nevertheless, none of them said that one of the versions was Latin-American. Participant 35, with a low level of English, commented that she felt the subtitles had variations in terms of vocabulary, but she was not able to give an example or explain the reasons for her feeling.

(1)   Participant 35: Yo creo que [los subtítulos] son diferentes. No sabría decir [por qué], es una impresión que me da […] La primera y la segunda [NP1, NP2] están más o menos igual y la tercera diría que la ha hecho otra persona [PRO].

I think the subtitles are different. I can't explain why, it's just the impression that I got. I think the first and the second one are more or less the same [NP1, NP2], but I'd say the third [PRO] was done by somebody else.

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One of the reasons for this could be the short exposure the participants had to each type of subtitle. As mentioned above, given some salient differences between Iberian and neutral Spanish, it is not hard for native Spanish speakers to identify the geographical imprint in the texts. For instance, the Iberian version used *vosotros* for the second person plural, while the Latin-American version used *ustedes*. Since each clip was only about three minutes long and participants watched one clip after the other, they may not have had time to pay much attention to the sociolinguistic aspects. As pointed out in previous studies (Secară 2011; Künzli and Ehrensberger-Dow 2011), results could be different with longer exposure to the subtitles. However, an experiment exploring the reception of an entire feature film could hardly include eye-tracking data, at least until we have access to more specialized tools.

6.1.4.3. Conclusion on Hypotheses 14 and 15

Surprisingly, the participants did not notice differences between the subtitles. I was convinced some of them would point out that one set of subtitles was Latin-American, but this did not transpire during the interviews. Considering the participants' comments, as shown in Table 103, it is not possible to confirm these hypotheses.

Table 103. Summary of the hypothesis testing for H_{14} and H_{15}

Hypothesis	Variable	Confirmation	
H_{14}	Inclination towards professional subtitles	✘	
H_{15}	Inclination towards Iberian non-professional subtitles	✘	The participants did not comment on the linguistic differences between the subtitles during the interviews. No evidence was found to confirm this hypothesis.

6.2. Findings from the qualitative data

6.2.1. Level of L2/L3

The results of the eye-tracking data indicated that there is a clear difference in terms of attention allocation between the participants with a high level of English and the participants with a low level of English. As expected, the participants in the HLE group allocated significantly less time to the subtitle area than did the participants in the LLE group. Additionally, they also skipped more subtitles on average. While in previous studies (d'Ydewalle and Bruycker 2007; Caffrey 2009), the percentage of *Skipped subtitles* was lower than 4%, HLE participants in my study had an average of 25% unfixated subtitles. This high average and the percentage difference in the duration on

the subtitle area hint at the existence of different reading behaviors that could be partly explained by the level of proficiency in the source language.

One of the most robust findings in eye-tracking studies is that the reading of subtitles is a more or less automatic behavior (d'Ydewalle et al. 1987; d'Ydewalle and Bruycker 2007; Kruger et al. 2015). This was reported by d'Ydewalle et al. (1987) in an experiment that included participants who knew the source language of the audiovisual products and watched them with subtitles in their mother tongue. They found that "the subjects who know very well the spoken language still read the subtitles as much as the other subjects" (1987:320). The findings from my study challenge that conception, since some of the participants managed to avoid fixating on the subtitle for most of the video runtime. It is important to point out that the constant exposure to subtitles might have caused the participants in d'Ydewalle et al. to become so used to reading the subtitles that they cannot avoid fixating on them. On the other hand, Spanish viewers who are more exposed to dubbed content may be instinctively more used to relying on the image than to depending on the subtitles. d'Ydewalle et al. (1991) actually showed there is some degree of control in subtitle reading, but it is still generally commented in the literature that the semi-automatization of subtitle reading is the most common characteristic. To some extent, the decision not to read the subtitles could be related to the Observer's paradox (Labov 1972): the participants tried not to follow the subtitles because they were being monitored and wanted to show they could do well without them. However, there are two reasons that could help understand why this is not necessarily the case: 1) in the pre-experiment questionnaire some of these participants declared they never use subtitles, before knowing the specificities of the experiment, and 2) their performance in the *Reception capacity* questions was not lower than that of the rest of the participants, which suggests they did understand the content of the clips.

The participants in the HLE group seemed to have developed autonomous reading processes. Reading behavior has been shown to be affected by the reading conditions or tasks. Rayner and Fischer (1996) and other researchers have shown there are differences in eye movements in different types of activities, such as reading, the scanning texts or visual search. Additionally, it has also been proven that there are viewer-related characteristics that affect this behavior. The hearing capacity of the viewers affects the subtitle reading performance (Szarkowska et al. 2011; Kruger et al. 2015): deaf and hard-of-hearing viewers are slower readers than hearing viewers, making more fixations on the subtitles and having longer mean duration fixations. The

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level of proficiency in the source language could be an internal factor that influences and shapes the subtitle-reading behavior.

So far, knowledge of the source language has not been thoroughly explored as a factor in studies on subtitle reception. Apart from studies with a focus on language learning, researchers analyzing the effects of subtitling have been more interested in exploring the reading behavior when participants depend completely on the subtitles. That is the case of d'Ydewalle and Bruycker (2007), who use a Swedish film, and Perego et al. (2010), who include a Hungarian film in their experiments. However, given the current globalizing exposure to English, and especially the multilingualism in Europe, it is safe to assume that the standard situation is not necessarily one in which the source content is totally foreign (Pym 2013). Most of the audiovisual material translated into Spanish in Spain comes from English-speaking markets and the audience, although not always proficient in the language, is relatively well-acquainted with it. The initial questionnaire included in this study shows that 60% of the surveyed university population has a middling or high listening-comprehension proficiency in English (Section 5.1.1), which would suggest a high level of contact with English as a foreign language. As noted, students in all undergraduate programs at the university are required to pass a test equivalent to the B2 proficiency level in English before they graduate.

In view of this apparent difference in behavior, here I will present the results of the participants who were placed in the *Order of presentation 5* in my experiment, in order to illustrate the different behaviors that I encountered. As shown in Section 5.3.3.2, the *Order of presentation* variable had a significant effect on *Skipped subtitles*. The participants in *Order of presentation 5* skipped 35% on average of the subtitles, a percentage that is significantly higher than the estimated means of the other orders.

The difference in the scores for *Order of presentation 5* are due to the fact that this group had four of the participants in the HLE group who allocated the least time to the subtitle area: Participants 12, 21, 39 and 44 (only Participant 21 is a man, the other three are women). The difference in the percentage of fixations on the subtitle area between these participants and the LLE participants in the same order of presentation is greater than the difference between the two levels in any other of the groups. Participant 21 made less than 1% of the fixations on the subtitle area and skipped 98% of the subtitles. Participant 12 skipped 84% of the subtitles and made about 3% of the

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fixations on the subtitle area. The other two participants each made 11% of their fixations on the subtitle area and skipped 53% of the subtitles.

Heat maps give a graphical representation of the difference in the number of fixations between LLE and HLE participants. Figure 44 shows the heat maps resulting from the data of the participants in Order 5. The column on the left shows the heat maps for the LLE participants per clip; the heat maps on the right represent the results for HLE participants. As can be seen, in the LLE heat maps, the higher concentration of fixations is on the subtitle area, while the case is reversed for the HLE participants, who have more fixations at the center of the screen on the image area.

Figure 44. Heat maps of the fixations of HLE and LLE participants in *Order of presentation* 5

There are some interesting aspects about the behavior of these participants. It is important to point out here that these behavior patterns are not restricted to the

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participants in Order 5[5]; I am merely referring to this group as an example because it unexpectedly includes a subsample of participants whose behavior clearly describes the particularity I noticed among some of the HLE participants. The salient features can be summarized as follows:

- There are viewers with a high level of proficiency in the source language who are able to adapt their subtitle-reading behavior to their needs and go to the subtitle area only on specific occasions.

- In most cases, the viewers do not go to the subtitles at the onset, when the subtitles first appear, but move their gaze to the subtitle area only after they have identified something in the audio track that sounds unfamiliar to them.

- Due to this behavior, there is a latency effect. *Latency* refers to the time between the onset of the subtitle presentation on the screen and the first fixation of the viewer on the subtitle (d'Ydewalle and Bruycker 2007). In some cases, the gaze reaches the subtitle area when the subtitle has already changed or disappeared, probably leaving the viewer without the information they required and causing a greater latency effect. However, this remark should be taken carefully. I did not calculate the latency time; this is merely a recurrent feature I noticed from the recordings.

- It is frequently the case that participants do not go to the beginning of the subtitles when they are looking for information. They move their gaze to the center of the subtitle area – as previously pointed out by Jensema et al. (2000b) – or towards the right side. Figure 45 presents one example in which three of the four participants fixated on the subtitle area. The image shows a higher concentration of fixations on the right half of the subtitles.

- Although I did not carry out a detailed analysis of the specific elements that caused HLE participants to look at the subtitle area, I could identify some elements that tend to provoke fixations on the subtitle area: long noun compounds, proper nouns, and low-frequency words or specialized terms. Again, the subtitle in Figure 45 serves as an example of this phenomenon. The

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[5] As explained in Section 4.2.5.2, I had to create six different tests in Tobii Studio for the six orders of presentation. Since Tobii Studio at the moment does not support across-test analysis, I can only provide visualizations per test and not for the complete sample of all participants per Level of L2/L3.

subtitle includes the name of actress *Ellen Page* and her film *Juno*, as well as a complex noun phrase "star of the charming independent film Juno".

- The differences in behavior between LLE and HLE participants are also reflected on the participants' enjoyment of the audiovisual content. The analysis found that HLE participants reported higher ratings for *Audience enjoyment.* Along with this finding, it should also be considered that higher ratings of *Audience enjoyment* correlate with higher ratings of *Self-reported comprehension*. Essentially, the HLE participants consider the content to be more enjoyable and the participants who give higher *Enjoyment* scores also claim higher *Self-reported comprehension.*

Figure 45. Example of HLE participants' fixations

6.2.2. *Subtitling and L2/L3*

The benefits of subtitling for language learning have been the subject of a constant debate in Translation Studies, as well as in foreign-language acquisition research (d'Ydewalle and Pavakanun 1995; d'Ydewalle 2002; Bisson et al. 2014). The idea that subtitles enhance language learning was also voiced by the participants in my study. Some of them specifically pointed out the *relation between subtitling and language learning as a benefit of and motivation for using subtitles*. During the interviews, it was evident that most of the participants, regardless of their level of English, assumed a direct relation between subtitling and language learning. The participants generally

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pointed to the benefits of subtitling for vocabulary learning and for general familiarity with the foreign language. Those participants who felt they had a higher level of English mentioned that they do not follow the subtitles entirely. For them, the subtitles act as an aid to understanding the content. The participants use the subtitles as a tool to confirm they understand the content or as a source of information where they can look for what they might have missed, instead of relying completely on them. Interestingly enough, this points towards a cognitive process that allows participants to watch subtitles in a selective manner, similar to what Künzli and Ehrensberger-Dow (2011) and Ramos Pinto (2013) found in their studies analyzing reactions to surtitles. Participant 43 (from the HLE group) explains how she uses subtitles only as a source of confirmation:

(2)   Participant 43: Más que nada para mí [los subtítulos] sirven para ver si lo que has oído es lo que has entendido. Yo preferiría que [los subtítulos] estuviesen en inglés, porque en español me distraigo y tengo la tentación de seguir en español porque es más cómodo.

For me, the subtitles work mainly as a way to confirm whether you understand what you hear. I prefer to have the subtitles in English. If they are in Spanish, then I become distracted and I am tempted to follow the Spanish subtitles only, because it is more comfortable.

For all of the participants it was nevertheless evident that the feeling of *reading* subtitles while watching a film is a more demanding activity than watching dubbed films. They use subtitles mainly because they consider it to be an activity with a twofold intention: watching a film for entertainment and making some effort to improve their English. As participants 35 and 47 (both from the HLE group) put it:

(3)   Participant 35: *Friends* la veo subtitulada para practicar el inglés. Y las otras [series] las veo dobladas. Los subtítulos son solo para practicar. Como ya he visto *Friends* en español y ya más o menos entiendo lo que dicen, entonces me es más fácil seguirlo y no tengo que estar leyendo todo el rato. Puedo practicar más el audio.

I watch Friends *with subtitles to practice my English. For other TV series, I use the dubbed versions. I use the subtitles only as a way of practicing. As I have already seen* Friends *in Spanish and I am able to follow what they say, it is*

easier for me to follow the episodes and I don't need to read all the time. I can practice some listening.

(4)   Participant 47: En la época en la que tenía que estudiar para inglés, las veía todas [las series] en versión original y subtituladas en inglés, pero cuando no tuve que hacer esto, las veo normal.

When I was learning English, I used to watch all [the TV series] in the original version with subtitles in English. But since I finished my English classes, I now watch them the normal way [i.e. dubbed].

6.2.3. Effect of the Clip variable

This study suffered from a regular disadvantage of experimental research that has a high degree of ecological validity. Although this approach allows one to recreate conditions that are similar to the real-life conditions of the participants, it also adds additional variables that should be controlled in order to identify the effects of the variables that are actually being studied. Along these lines, when selecting the clips and the subtitles to be included in the experiment, I took special care to ascertain that the audiovisual and technical features of the clips were not altered. My primary interest was preserving the integrity of the audiovisual content. The clips were self-contained, they included a complete scene each time, and they were all taken from the same season. The same number of characters interacted in each excerpt and the discussion was structured in a similar fashion. Additionally, I decided not to alter the duration of the subtitles and used three different versions of the video clip with different frame rates. By doing that, I avoided modifying the time codes of the subtitle versions.

This process resulted in three clips that were different in length but complied with the aforementioned requirements. The clips were thus assumed to be comparable. There were some differences that I noticed at the beginning, but they were considered inherent to the audiovisual material. I was suspicious about Clip 1 because a significant number of the dialogues included a discussion between Raj, an Indian scientist with a very strong accent, and Sheldon, a character whose speech tends to be very fast-paced. In Clip 2, part of the conversation is at a very rapid pace. When comparing the number of words uttered per second, Clip 2 has a higher ratio, with 2.5 words spoken per second, while Clips 1 and 3 have ratios of 1.8 and 2.3 words per second respectively. In the end,

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the accented English in Clip 1 did not seem to put additional pressure on the participants, but it is likely that the faster speech rate in Clip 2 caused problems, as explained below.

The results show that the participants found Clip 2 more demanding in terms of allocation of cognitive resources and performance. One of the advantages of using mixed-models to analyze the data is that the models account for these types of variations and make their influence measurable. In this case, the *Clip* variable affected the behavior of participants at different levels. In terms of eye-tracking measurements, it had an effect on the percentage of fixations they made in the subtitle area and, consequently, on their attention shifts ratio. At the level of the comprehension of the content, it affected their *Reception capacity* and also the enjoyment of the clip. In order to illustrate this, Figure 46 shows the accumulated fixation duration of all participants, HLE and LLE, in Order of presentation 1 for the three clips. It can be seen that in the heat maps of Clip 1 and 2 there are hot areas over the image area, while none can be found on the image area in Clip 2, indicating that the participants fixated for much longer on the subtitles.

Figure 46. Heat maps with fixations durations made by all participants in Order 1
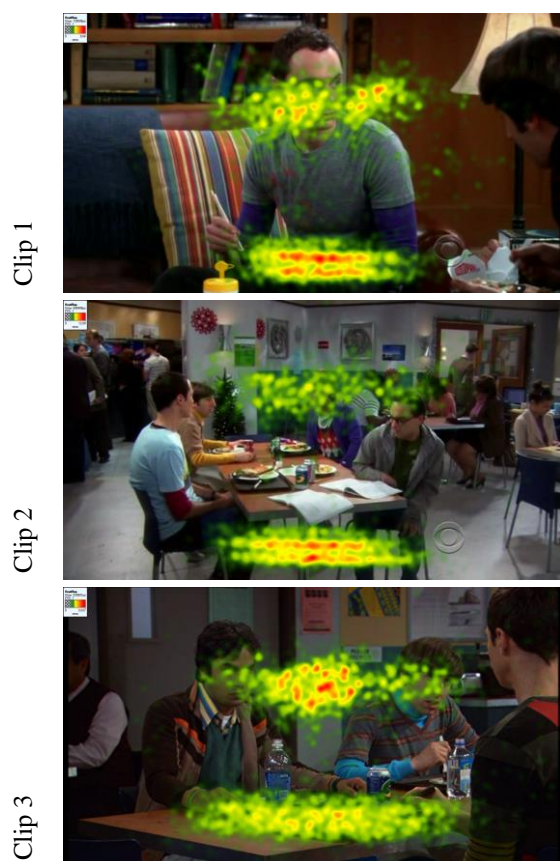
On average, the participants fixated 54.4% of the time on the subtitle area when they were watching Clip 2 and had an attention shift ratio of 1.7, lower than the 1.9 attention shift ratio for the other two clips. This means participants not only spent longer periods of time looking at the subtitle area, but they also made fewer attention shifts per subtitle. They stayed in the subtitle area during the time in-between subtitles. This behavior implies a high degree of reliance on the subtitles: the participants recognize that it is harder for them to understand the subtitles and then decide to allocate a higher share of their attention to the subtitle area, even sacrificing incidental glances at the image. This trade-off in attention allocation is evident in the results of the statistical analysis. The reduced attention on the image area correlates with poorer scores in *Iconic attention*. The *Clip* variable was the only one that had a significant effect on *Iconic attention*: the participants obtained fewer correct answers for Clip 2 than for the other two clips.

Figure 47. *Percentage of duration of fixations* per *Clip* and *Level of L2/L3*
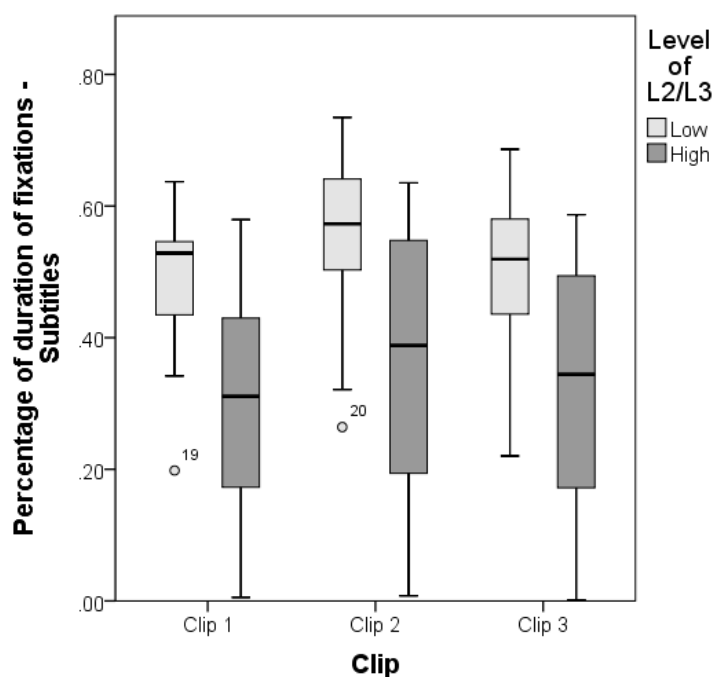
A closer look at the data shows that this behavior affects both types of participants, those with a high and those with a low level of English indistinctively. Figure 47 shows the percentage of durations of fixation per *Clip* and *Level of L2/L3*. As in other cases, there is more dispersion in the values for the participants in the LLE group in all three clips. However, it can be seen that the mean percentage of fixations increases for all participants in Clip 2. The mean *percentages of duration of fixation on*

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the subtitle area for HLE and LLE in Clip 2 are 35% and 56% respectively. These values are higher than the average 30% fixation duration HLE participants had with the other two clips and also higher than the 49% and 51% fixation duration observed in Clip 1 and Clip 3 respectively for the LLE group.

In terms of performance, Clip 2 produced poorer results in *Reception capacity* than the other two clips. The estimated mean score for Clip 2 was significantly lower than that of Clip 1 but the difference between Clip 2 and Clip 3 was not significant. The *Clip* variable also had an effect on *Audience enjoyment*. Interestingly enough, Clip 1, which produced the best score in terms of *Reception capacity*, was also judged to be the most boring clip among all three.

The variability among the clips allows for further considerations. Given that the *Clip* variable did not have a significant effect on *Mean fixation duration on the subtitle area*, it could be claimed that the length of individual fixations as such is not affected by the increase in the dialogue speed. Only the number of fixations a viewer makes on the subtitle area actually increases, which consequently affects total fixation duration. This supports the idea of using the number of fixations on an area as an indicator of cognitive effort.

The results also provide insights into the effectiveness of subtitles. In all three subtitling conditions, Clip 2 had subtitles on the screen for the longest period of time. In the case of PRO and NP1, subtitles were on the screen for 87% of the segment runtime. In the case of NP2, subtitles were shown 80% of the time. This contrasts with the other clips, in which subtitles where shown from 66% to 79% of the time. The results are thus rather contradictory, if we consider that the participants stayed in the subtitle area longer, sacrificing the possibility of watching more of the image. It seems a rather paradoxical outcome that they had the lowest score in *Reception capacity* when they stayed longest on the subtitles. Naturally, there can be other reasons for the participants to stay for longer on the subtitle area, but given that they face the same situation under all three subtitle conditions, the subtitle effectiveness seems to be a plausible explanation.

6.2.4. *Viewers' familiarity with subtitles*

Another variable that provided thought-provoking results at the analysis stage was the familiarity of participants with the subtitles. Spain is traditionally considered a dubbing

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country, but, as it has been explained, the traditional divisions of audiovisual translation have been adjusting to accommodate more active users. Taking that into consideration, I included variables to explore the effects of the participants' use of dubbing, subtitling, voice over and closed captioning.

Little has been done to compare how different levels of familiarity with an audiovisual translation modality affect the viewer's behavior. It is commonly assumed that the country where the viewer lives or grew up serves as a categorization (d'Ydewalle et al. 1991; Perego et al. 2010; Künzli and Ehrensberger-Dow 2011). People coming from dubbing countries will be more used to dubbing than will people coming from subtitling countries. While this assumption is likely to hold for environments where there is only a reduced number of sources of audiovisual content, under the current network of media flows and content circulation, taking this broad categorization as a standard is very rough at best. Subtitles currently serve diverse audiences who have different degrees of familiarity with subtitle reading. The viewer's use of subtitling, in this case, becomes an internal-viewer factor that could affect the way people engage with the content and could also shape their behavior.

The *Use of subtitling* variable had a significant effect on all but one of the eye-tracking measurements included in the study (the exception was the *Mean fixation duration on the image*), as well as on *Subtitle-reading effort* and *Self-reported comprehension*. According to their use of subtitling in the six months prior to the experiment, the participants were grouped in five levels, ranging from those who say they *never* use subtitles to those who claim they *always* use subtitles. As detailed in Section 5.3.1.1, the initial five categories were reduced to four to make the statistical analysis possible: Never, Rarely, Occasionally, and Very frequently/Always. The results show that there are differences in the behavior of participants who have different levels of familiarity with subtitles. As partly commented on in Section 6.1.4, there were participants in my study who managed to fixate on the subtitle area for a very short amount of time and looked at the image area for more than 90% of the runtime. As a general result, the *Never* group was significantly different from the other three in all occasions, while *Rarely* was different from all other groups although the differences did not reach statistical significance.

The subgroup of participants who *never* use subtitles comprised four HLE participants. This is the group that differs the most from all the others: in all cases the difference with every other level of familiarity is statistically significant. This group of

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participants had the longest estimated mean fixation on the subtitle area, 216.76 ms, surpassing the other groups by between 27 and 37 ms. On average they only spent 30% of the time on the subtitle area, which contrasts with the average 43% that participants in the HLE group allocated to the subtitles. Additionally, they had the lowest attention-shift ratio and skipped 38% of the subtitles, while the group of occasional and frequent users skipped about 30% only.

These participants' scores also indicate their self-reported comprehension was better than that of the rest of participants and they reported the lowest scores for *Subtitle-reading effort*. However, no significant effect of the *Use of subtitling* variable was found on *Reception capacity*, which indicates that these data do not support the participants' impression that they comprehended better. The longer fixations, combined with the reduced amount of time they spent on the subtitle area, means HLE participants who had never used subtitles did not follow a completely linear reading behavior when they were watching subtitled material. However, the participants did fixate upon 62% of the subtitles, which is indeed a high percentage, and their scores for *Subtitle-reading effort* were low. This means the participants found the translation useful and easy to follow. The results come as a surprise. By inspecting the eye-tracking recordings, there seems to be a longer latency effect among these participants. They fixate on the subtitle after identifying something in the audio that puzzles them and that triggers a deflection to the subtitle area. As noted in Section 6.2.1 above, in many cases, this means their gaze fixates on the subtitle shortly before it disappears, presumably leaving them little time to process the information. However, it could also be the case that the confirmation they are looking for is sufficiently supported in the time in which they can try to read the subtitle.

In a study carried out in Belgium using intralingual subtitles, d'Ydewalle et al. (1991) found that participants from the United States who are not used to subtitling (due to the scarce use of subtitles in the US) spent up to 27.07% of the subtitled time on the subtitle area, even though the content was available to them in their own language (intralingual subtitles). Unfortunately, the study does not report the number of skipped subtitles, so we cannot make comparisons. However, the American participants spent less time on the subtitle area than the average time of the HLE group in my experiment. The authors do recognize that some type of control can be exerted by viewers: "Reading subtitles seems to be at least partially under the subject's control. It should be noted,

however, that this personal control does not imply the absence of automatic processes" (d'Ydewalle et al. 1991:656–657).

Once more, I rely on the participants from *Order of presentation 5* to show the difference between viewers with different levels of familiarity with the subtitles. In Figure 48, the image on the left shows the heat map of Clip 3 created with the accumulated fixation durations from Participants 12 and 39, who say they *never* use subtitles, and the image on the right shows the heat map of the same clip resulting from the accumulated fixation durations of HLE and LLE participants in the same group, who say they use subtitles *occasionally*. The hottest areas are totally reversed, with the participants who never use subtitles focusing almost restrictively on the image and the other participants spending more time on the subtitles but still looking at the image for some time.

Figure 48. Heat maps for participants who use subtitles *never* (left) and *occasionally* (right)

The interview data from HLE participants offer some additional information to complement the picture of their behavior. Participant 18 says the subtitles distract her from the action on the screen and that this bothers her. She realizes that even if she is not relying on them to access the content, it is inevitable to fixate on the subtitle area. Participant 4, who spent on average only 6% of the time on the subtitle area, also sees the subtitles as a distraction, while Participant 12, who looked at the subtitle area for 3% of the time, says she uses the subtitles as a support:

(5)　　Participant 04: Sí, [miro los subtítulos] por inercia. Sin pensarlo muchas veces porque estoy entendiendo lo que están diciendo, pero como están los subtítulos, los ojos se van a los subtítulos aunque intento no hacerlo porque me distrae de lo que están diciendo.

Yes, I look at the subtitles out of habit. I do it unconsciously since I am able to understand what they are saying, but as the subtitles are there, my eyes go there

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automatically. I try not to do it because it distracts me from what the characters are saying.

(6)   Participant 12: Para mí no son necesarios los subtítulos en general, pero si hay alguna palabra que no entiendo, sí miro directamente los subtítulos. No me molestan, cuando me acostumbro a ello, porque cuando veo series en inglés no me hace falta mirarlos, pero si veo alguna cosa en otro idioma, a veces, tal vez porque no estoy acostumbrada, pero me cuesta un poco. No me cuesta leer y mirar, pero siento que me pierdo un poco de la imagen. No me distraen cuando aparecen en pantalla. Los uso como referencia.

In general, I really don't need the subtitles, when there are words I don't understand, then I look at the subtitles directly. Once I get used to them, they don't bother me. When I'm watching TV series in English I don't need to look at them, but if I watch something in a different language, sometimes, maybe because I am not used to them, it is harder for me. It's not that reading the subtitles and watching the video at the same time is harder for me, but I feel I'm missing some of the image. The subtitles don't bother me when they are on the screen. I use them as a reference.

Apart from the results for the group who *never* uses subtitles, the participants who *rarely* use subtitles had a behavior pattern that is hard to explain. While the participants who are more used to subtitling (those who use it occasionally and very frequently/always) spent 54% of the time on the subtitle area, the participants who rarely use it spent 65% of the time on the subtitle area: they read almost all the subtitles, skipping less than 1%. This group also makes the most attention shifts and reports the lowest mean comprehension score. None of these differences reach statistical significance when compared to the results of the *Rarely* and *Very frequently/always* groups. However, the picture the results show is interesting. As can be seen in the graphs in Chapter 5 (e.g. Figure 21, Figure 26, Figure 38), the curves created for *Use of subtitling* are always interrupted by the results of the level *rarely*. As shown above, those participants who *never* use subtitles have a completely different behavior from the participants who have a more regular use of subtitles. In that sense, the *Never* group is made of viewers that have developed an independent reading pattern. It could be said that the participants who *rarely* use subtitles are the ones who have decided they need

the subtitles and, as part of the process of becoming used to them, spend more time on the subtitle area than do the participants who are already more used to the subtitles. The *Rarely* group should actually be considered to be at the base of the learning curve. As viewers become more used to the subtitles, their behavior sharpens and somehow becomes more homogeneous, as can be seen by the very similar results for participants who *occasionally* or *very frequently/always* use subtitles.

6.2.5. Quality from the viewer's perspective

Once the interview was almost completed, the participants were told the specific purpose of the research and the details of the audiovisual material. Once again, they were asked if they noticed any difference between the subtitles or if they thought the same person could have made them all. This time, some of them said that they had noticed differences but that it was difficult to pinpoint any specific aspect or to indicate in which clip the differences occurred. In general, the participants said the quality was good. Most of the participants were able to recall the color of the subtitles (white) and their position on the screen. About half of the participants answered in the affirmative when asked if they thought the same person did all three translations.

One aspect that called the participants' attention as a sign of low quality was the layout of the subtitles. Figure 49 shows the layout of the three types of subtitles on the screen as seen by the participants. The professional version (at the top) looks blurrier than the other two and, although the subtitles are white, they are not as bright as the non-professional versions.

Although all three versions use proportional fonts, the font size is different. The professional version looks more spread-out across the screen. In the example, the professional subtitle has 27 characters and the NP2 version has 30, but the professional looks longer. The blurriness caused some of the participants to assume the professional version was actually a non-professional version, because it was "more difficult to read". They also pointed out that the professional subtitles were "longer" because they occupied more space on the screen, as in Figure 43. For some participants, these features signaled that the subtitles were of low quality; they assumed they were the non-professional versions. As pointed out above, the *Mean fixation duration on the image* and *the subtitle areas* vary depending on the *Type of subtitle*. In both cases, the mean fixation durations in the PRO versions were shorter than the means in the other two

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versions, which at the same time were more similar between them. Although it is hard to test if this is to some extent caused by the appearance of the subtitles on the screen, it is worth commenting that the two non-professional versions have the same appearance while the professional version is different. It is possible that this difference in format had an effect on the viewer's behavior, but it would be necessary to carry out a different study in order to test whether this is true.

Figure 49. Layout of the subtitles on the screen
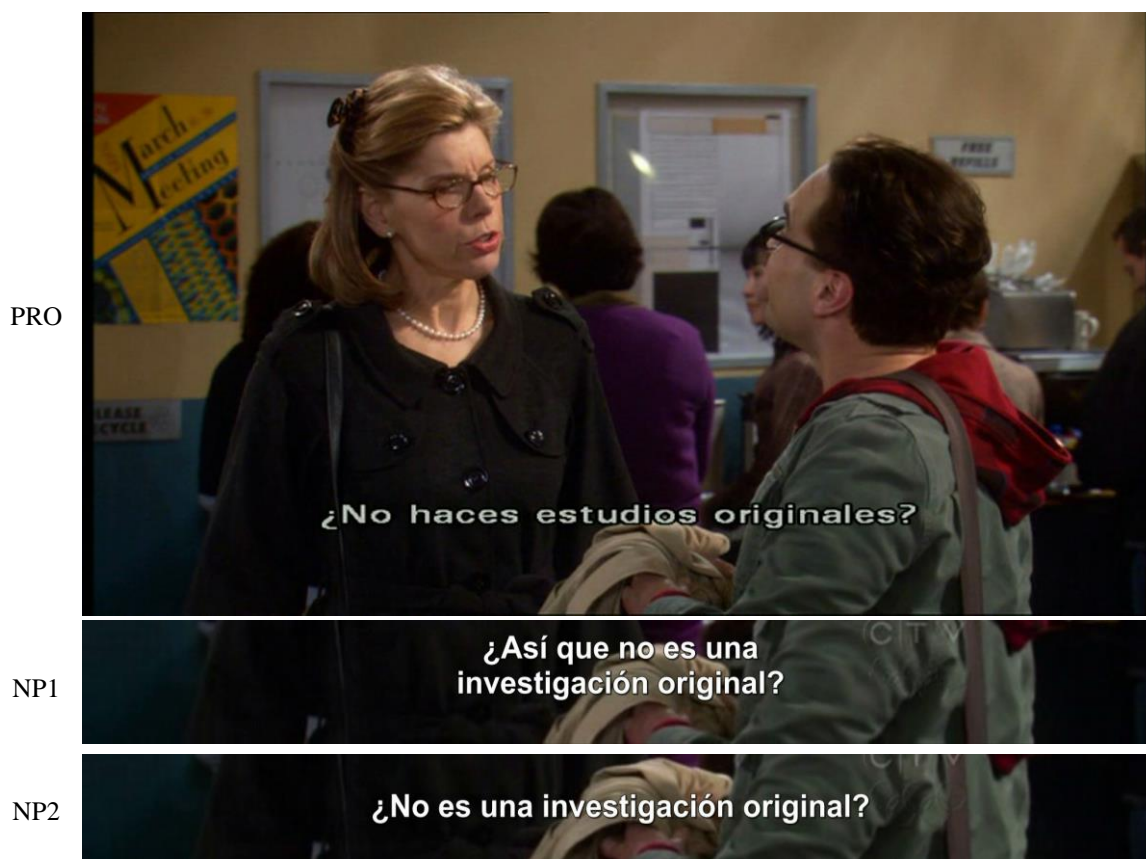
Participant 39 (with a high level of English) said the first video she watched (PRO) was different from the other two, and that it was harder to read. When de-briefed, she was actually surprised those were the professional subtitles. Participant 10 (with a low level of English) commented on the subtitles even before I told him about the purpose of the research:

(7) Participant 10: […] los dos primeros [subtítulos, NP1 and NP2], han sido bastante similares. […] Cuando tenía alguna duda, bajaba la vista y se podía leer fácilmente sin desviar mucho la vista a la hora de ver el vídeo. En cambio en el último [PRO] eran quizás frases muy alargadas que iban de punta a punta de la pantalla y al pasar abajo tenías que desplazar tanto la vista que directamente no

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podías estar mirándolo [el vídeo]. En este caso el subtítulo del tercer vídeo era incómodo y a la vez un poco difícil de leer.

The first two [subtitles, NP1, NP2] were very similar. […] Whenever I had a doubt, I'd look down and they were easy to read without losing total sight of the video. With the last subtitle [PRO], on the other hand, the sentences seemed to stretch from one side of the screen to the other and whenever I needed to go down the screen, I had to shift my gaze so much that it was impossible to continue watching the video at the same time. In that sense, the subtitles for the third video were more uncomfortable and, at the same time, harder to read.

Another feature that raised flags for the participants was spelling. In one of the non-professional subtitles, the name of the actor *Zac Efron* was written with a *ph* as *Ephron*. Some participants pointed this as a mistake during the interviews and said this could be an indicator of non-professional subtitling. This assumption was not only restricted to mistakes. In the third clip, one of the characters mimics the accent of *Jar Jar Binks*, the fictional character from Star Wars. Subtitlers, both professional and non-professional, tried to adapt the subtitles to mimic the character's accent. However, the participants judged this to be a poor decision by the translators. This concurs with the results of Gottlieb's (1995) experiment in which some participants judged normal subtitling solutions (such as condensation and reduction) to be mistakes.

The above-mentioned aspects show one dimension of what viewers could consider to be indicator of quality in translation. As can be seen, the aspects that viewers assume to be indicators of quality are not necessarily the same ones that translators would take as features signaling the quality of a translation. Evidently, it is difficult to reconcile these two aspects: translators are responsible for providing translations that are suitable for the audience and many of their decisions and options are the results of complex thought processes, while receivers commonly reduce translation to a one-to-one replacement process. However, knowing what is relevant to the audience could help translators in their decision-making processes. Empirical data could help them decide among a multiplicity of options. The discussion, from a Translation Studies perspective, should not stay at the level of what is better or worse, but rather focus on the possibilities offered by the newly acquired knowledge. Prosumers and the other members of the participatory culture are providing new

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information and shaping new behaviors that should be taken into account, since they are the ones using the translations. For instance, Participant 21, from the HLE group and assigned to Order of presentation 5, comments on how he uses the subtitles:

(8)   Participant 21: En general no los he mirado [los subtítulos]. Creo recordar haber hecho cuatro o cinco movimientos como buscando alguna expresión en concreto o algo que me sorprendió […] fue una mirada muy rápida como diciendo "¿Y esto cómo lo van a traducir?" porque a veces me gusta mirar qué patrón siguen y qué parecido hay entre los subtítulos y lo que traducen, porque a veces no tiene nada que ver y a veces está bien y hay cosas que no se pueden traducir, que las tienes que ver en versión original o no funciona. Pero claro entonces tienes que dejar la película o la serie aparte y fijarte sólo en la curiosidad de ver hasta qué cierto punto los subtítulos tienen o no fidelidad respecto al texto.

I did not look at all the subtitles. I'd say I looked at them four or five times searching for a specific expression or something that surprised me. It was a quick glance, I just wanted to check how they translated it. From time to time I enjoy searching for the pattern they follow and how the subtitles compare to what is being translated. Sometimes the subtitles don't have anything to do with the original and sometimes the translation is good. Besides, there are things that can't be translated, you have to access the original or it doesn't work. However, to do the comparison you have to stop looking at the film or the show and, out of curiosity, fixate on the subtitles to see how faithful the subtitles are to the text.

During the interview I also asked participants directly about their feelings related to non-professional subtitling. The participants have, in general, very different opinions about the subtitles available on the Internet. From their comments it is possible to see that they are aware of variations in terms of quality but, considering the aspects mentioned above, they have also learned to interact with the subtitles, classify them, and decide when they can use them or how to come to terms with the complex situation. Participant 48 mentioned that, for her, having the possibility of watching the series is more important than having *perfect* subtitles. Participant 13 explained how he tries to look for the best subtitles available:

(9)   Participant 13: A veces hay muchos errores y lo notas o incluso se saltan trozos, o la traducción no es buena. [Los uso] para asegurarme que entienda [sic] lo que están diciendo. A veces si fueran muy diferentes, muy malos, o los saco o busco otros de otra persona. Además también a veces hay latino y a veces español.

Sometimes there are many mistakes and you can spot them, or they even skip some parts, or the translation is not good. I use them to make sure that I understand what they are saying. Sometimes when they look very different from the original or the quality is too bad, I look for another subtitle file made by a different person. Also, sometimes there is also the Latin-American version and the Spanish version.

Participant 24 mentioned that variations in the subtitles depended on the source language of the material:

(10)   Participant 24: [En cuanto a la calidad de los subtítulos de Internet] Depende… hay mucha variedad, depende de dónde los saques. Generalmente, algunos están muy desfasados. Por ejemplo, en inglés no lo cojo tanto, pero cuando cojo películas de Brasil, la traducción suele ser bastante mala.

The quality of subtitles on the Internet depends… there are many options, it depends on where you get them. Normally they are completely out-of-sync. For instance, I do not notice it that much in English, but when I watch Brazilian films, the translation is usually very bad.

6.3.   Audience control over the viewing experience

One of the characteristics of the new media consumption habits is that users have the possibility of exercising more control over the viewer experience. They can decide what to watch, when to watch it, and how. In that sense, media consumption has become more flexible. The interview questions aimed at going deeper into the aspects that were previously explored in the questionnaires. During the interviews, various indications were given as to the factors influencing the participants' choice of different translation modalities. In the following sections I will cover some aspects that exemplify how the participants are accessing media content and integrating it into their routines.

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6.3.1. Foreign audiovisual content and distribution delays

One of the most interesting results from the interview stage had to do with the amount of non-local content that is consumed by the participants in the study. Most of the participants mentioned that half or more than half of all the audiovisual content they consume is not produced in Spain. This is consistent with what is reported in the *Video-Over-Internet Consumer Survey 2013* (Accenture 2013), which states that in Spain 39% of consumers use local/national online video providers while 61% of them access content using international online video providers.

The time between the original release in the United States and the availability of the content in the Spanish market is still the main reason why the participants decided to use non-professional subtitles. This was one of the reasons for the emergence of fansubbing and the trend is continuing; people want to access the content as soon as it is released in the United States. Additionally, it should be recalled that heavy users of audiovisual content rely mostly on the Internet as their source of films and TV series, as pointed out in the results of the pre-experiment questionnaire. Some of the participants said during the interview they watch subtitled content because it was available sooner than the dubbed version that was released in Spain. Here are the opinions of two of the participants:

(11) Participant 8: [Veo] muchas, muchas series. Veo bastantes de la BBC. Veo *Doctor Who, Sherlock, Downton Abbey*. Después de americanas también veo *Orphan Black*… no sé, bastantes. Así de comedia también veo *New Girl*… Todas en Internet, pero si las pasan al poco tiempo de haberlas sacado allí, las veo por la tele. Pero, pocas veces.

[I watch] lots and lots of TV series. I watch many from the BBC. I watch Doctor Who, Sherlock, Downton Abbey. *When it comes to American TV series, I watch* Orphan Black… *I don't know, lots of them… As for comedies, I watch* New Girl *and… I watch all of them on the Internet, but if they are on TV soon after they were released in the United States or the United Kingdom, then I watch them on TV, but that almost never happens.*

(12) Participant 48: [Sigo] *Falling Skies, Juego de Tronos, The Walking Dead* y también películas. Todas en Internet. Si salen antes las dobladas, las dobladas, y

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si no han salido todavía, pues me tengo que mirar las que tienen subtítulos. [Con el doblaje] puedo estar más atenta a la imagen.

[I follow] Falling Skies*, Game of Thrones, The Walking Dead and also many films. I watch all of them on the Internet. If the dubbed version is available first, then I watch it, but if it is not ready yet, then I have to watch the version with subtitles.*

They see fast production of subtitles as the best way to access content and keep up with the releases in the United States. In some cases, subtitles are mentioned as a necessary evil. People want to access the content, but find themselves confronted with a linguistic barrier. Although some of them would rather watch the dubbed version, they decide to put up with the subtitled one in order to watch the content. Even in those cases, participants said that they enjoyed the content, and that was the reason why they decided to continue using subtitles. They recognize the value of subtitling as a way to keep watching the series. For instance, Participant 30 said she preferred to watch the material dubbed into Spanish because it is easier for her than reading the subtitles and watching the image at the same time; nevertheless she watches *Orphan Black* and *New Girl* online with subtitles because they are usually dubbed and distributed much later in Spain.

6.3.2. *Making decisions about dubbing or subtitling*

6.3.2.1. *The use of different translation modalities depending on the audiovisual content*

Surprisingly, a recurrent issue mentioned by participants was the classification of translation modalities and their preference for them depending on the type of content they watch. In some cases, participants provided information on how they were inclined towards a given translation mode, and they did so in an informed and structured way. Some participants said they preferred watching dubbed films because films are mostly made of only one instalment or just a few of them in the case of sequels and trilogies. For the participants, watching a film (rather than a series) involves a lower degree of personal engagement with the content. On the other hand, when it comes to TV series, they would be more inclined towards the use of subtitles. Since TV series normally have more than eight episodes per season (with the exception of mini-series) and possibly several seasons, participants are able to acquire more knowledge about the characters,

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the way they interact, their behavior and especially their speech. Listening to them on a more regular basis allows the participants to anticipate characters' behavior and to use their prior knowledge to compensate for any information that might possibly go unnoticed or that they do not fully understand. They become what Allen (1985) call *expert viewers*, since they already know the network of the characters and the plot. Participants pointed out that they understand subtitling as *good enough* for their purpose of keeping up-to-date with the events and being able to watch the show as it is broadcast in the United States. For instance, Participant 46 explained how she decides about translation modalities based on the genre of the content:

(13)   Participant 46: Veo [las series] en Internet subtituladas. Prefiero verlas en inglés que dobladas y no que no haya subtítulos […] En cambio, las películas, normalmente las miro en español. Siempre las veo dobladas, no lo sé, es una costumbre. Supongo que porque cuando sigues una serie, más o menos conoces a los personajes, lo que van a decir, el tema y voy aprendiendo sobre cada tema un poco escuchándolo en inglés. En cambio una película que son solo dos horas quizás debería estar demasiado concentrada y prefiero relajarme y verla tranquilamente sin tener que esforzarme para comprender.

I watch the subtitled [TV series] on the Internet. I prefer watching them in English than dubbed and without subtitles [...] But when it comes to films, I mainly watch them [dubbed] in Spanish. I always watch dubbed films, I don't know why, maybe because I am used to it. I guess it's because when you follow a TV series, you somehow know the characters, what they're going to say, the topic and I also learn about each topic if I listen to it in English. But, as films go for about two hours, then perhaps I would need to be very focused on them and I prefer to relax and watch them without any pressure to understand.

6.3.2.2. The integration of viewing time into participants' routine

In terms of time management, most of the participants pointed out that when it comes to multi-tasking, dubbing is without any doubt the only possible solution. If they are doing chores at home or are busy on the computer, for instance, then they would immediately select the dubbed version as the best option. Additionally, the time of the day when the participants watch the material also affects their decision. Participant 20 commented on the benefits of watching shows on the Internet:

(14)   Participant 20: [Veo las series en Internet] porque a la hora que la ponen por la tele o los días que la dan, pues no la puedo ver por la tele porque no se compagina con mi horario. En cambio, por Internet puedes verlo cuando a ti te vaya bien.

[I watch TV series on the Internet] because when they show them on TV, I can't watch them because it doesn't fit in with my schedule. But on the Internet you can watch them whenever you want.

Another circumstance that immediately prompts this decision is related to the company they have when they are watching the video. Even participants who prefer subtitling would easily adapt and watch the dubbed version if the people who they are watching the product with do not like subtitles, feel incapable of following them, or simply prefer the dubbed version. In some cases, however, the influence of company also works to the *benefit* of popularizing subtitles. About half of the participants mentioned they decide to watch a certain TV series or film based on their friends' recommendations. Although they also enjoy the content, watching a certain type of product also becomes a way of interacting with their group of friends. By following the influence of others, they adopt translation modalities and video service providers that would not necessarily be their first option if they looked for audiovisual content by themselves. Another claim that was mentioned during the interviews was that being able to watch a TV series or a film in the original language with subtitles indicates that they are able to understand the film and also to appreciate the content in its original form, which grants them additional prestige among their peers. When asked how he decided which translation mode he used for a given product, Participant 10 mentioned:

(15)   Participant 10: Si me recomiendan que es mejor en versión original, la veo en versión original. Si me lo recomiendan que tiene una buena traducción, la veo con traducción.

If [my friends] recommend the original version because it is better, then I watch the original version. If they say that it has a good translation, then I watch the translated version.

Following the same line of argumentation, some participants mentioned that reading becomes tiresome since it requires that their attention be fully directed to what

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is happening on the screen. This makes it impossible for them to watch subtitled material when they are feeling tired after work, for instance. The participants say they prefer to watch subtitled material when they are totally relaxed and are willing to read the subtitles and follow the action. Participants 35 and 51 commented as follows on the shortcomings they saw in subtitling, considering the cognitive effort it demands:

(16) Participant 35: Bueno, le puedes poner los audios en idioma original, los subtítulos. Y a veces lo hago. Hay días que no tengo ganas y digo, hoy en español, porque no quiero leer. Pero hay días que sí.

Well, you can play it with the original soundtrack and the subtitles. I sometimes do. There are some days when I don't feel like doing that and I'd rather just watch it [dubbed] in Spanish, because I do not want to read. Other days I do it.

(17) Participant 51: Es mejor si lo ves y entiendes sin subtítulos a la primera, porque el hecho de estar para abajo y para arriba es un poco incómodo, pero no me molesta. [De todas formas] cuando estás leyendo pierdes bastante la imagen.

It's better when you can watch it and understand it without reading the subtitles. Looking up and down the screen can be inconvenient, but it doesn't bother me. Anyway, when you are reading, you lose a lot of what is happening in the image.

6.4.   Discussion summary

Three initial main hypotheses were postulated at the beginning of this study. After putting them to test, the results can be summarized as follows:

- H$_1$: Participants' comprehension scores will be higher with professional rather than non-professional subtitles.

  There was no support for this hypothesis. Although there were differences between one of the non-professional subtitle versions and the professional version in the performance measurements, the non-professional Latin-American version obtained results similar to those of the professional versions. In terms of technical aspects, eye-tracking measurements seem to confirm that the professional version allows for a smoother subtitle-reading process by allowing the participants to alternate between the image and the subtitles.

- H₂: Participants with a high level of proficiency in L2/L3 will be less dependent on subtitles than will participants with a low level of L2/L3.

  The second hypothesis was confirmed. As expected, the participants with a low level of L2/L3 followed a more linear subtitle-reading behavior. HLE participants fixated less on the subtitle area and exhibited different types of behaviors: some of them relied on the subtitles as much as LLE participants did, but some others resorted to the subtitles as support on specific occasions only. Interestingly, some of the HLE participants avoided the subtitles almost completely. However, on the occasions when HLE participants who never use subtitles did look at the subtitle area, their mean fixation was longer, indicating a higher cognitive effort.

- H₃: Participants' reception scores will be higher with the non-professional subtitles produced in Spain (their own country) than with the non-professional subtitles produced in Latin America.

  The participants were not positively inclined either towards the professional subtitles, or towards the non-professional Iberian subtitles. When asked directly about the quality of non-professional subtitles, they did claim some of them have a very low quality. However, they did not identify the subtitles in this experiment as non-professional.

Additionally, recapitulating the additional information obtained from the interviews, the participants explained they think subtitles are more demanding. However there are reasons for the participants to put up with them. For instance, they do it because they want to access the original content before it is distributed in Spain or because they think it constitutes a better experience. Also, they see subtitling as an opportunity to improve their foreign language skills. Instead of favoring dubbed products exclusively, there seems to be a cohabitation of subtitling and dubbing in the participants' consumption of audiovisual content (Chaume 2013; Casarini 2014). Depending on different consumption conditions, they can decide which translation modality to use.

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Chapter 7. Conclusions

This study on reception was grounded on the orthodox assumption that non-professional subtitles generally have lower quality than do professional subtitles. Another feature that was explored was the viewers' level of proficiency in the source language of the content. The main questions guiding the study were:

- *Does audience reception indicate any difference between the professional and the non-professional subtitles?*
- *Do better reception scores correlate with professional subtitles?*
- *Does the users' level of proficiency in L2/L3 affect the reception of professionally and non-professionally subtitled audiovisual material?*
- *Do participants notice any difference between professional and non-professional subtitles?*

In order to answer these questions, the *Type of subtitle* and *Level of L2/L3* variables as well as the variables resulting from the operationalization of reception were brought into relation to postulate three main hypotheses:

- H_1: Participants' comprehension scores will be higher with professional rather than non-professional subtitles.
- H_2: Participants with a high level of proficiency in L2/L3 will be less dependent on subtitles than will participants with a low level of L2/L3.
- H_3: Participants' reception scores will be higher with the non-professional subtitles produced in Spain (their own country) than with the non-professional subtitles produced in Latin America.

These hypotheses were further refined and became fifteen sub-hypotheses that were put to the test in the study (see Section 4.1.4). The sub-hypotheses make assumptions on the relation of *Type of subtitle* and *Level of L2/L3* and the variables defined to assess reception. The sub-hypotheses were put to test and results are presented in the following sections to provide an answer to the research questions.

In general terms, *Type of subtitle* did not affect the participants' performance. *Level of L2/L3* proved to be a factor affecting eye-tracking measurements at almost all levels. However, no effects were found on *Reception capacity* testing. Surprisingly, neither the qualitative nor the quantitative data indicate an inclination of the participants towards the Iberian non-professional subtitles.

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7.1.   Research questions answered

Does audience reception indicate any difference between the professional and the non-professional subtitles?

Do better reception scores correlate with professional subtitles?

The first research question asks about the correlation between *Reception capacity* and *Type of subtitle*, the second asks whether the performance scores of the participants will be better when they watch the professional version.

These questions, related to the type of subtitle, were answered based on H_1: *Participants' comprehension scores will be higher with professional rather than non-professional subtitles*. It was tested through seven sub-hypotheses involving *Attention allocation*, *Mean fixation duration*, *Skipped subtitles*, *Attention shifts*, *Reception capacity*, *Subtitle-reading effort*, and *Self-reported comprehension*. In postulating the sub-hypothesis, I contend professional subtitles result in higher comprehension scores, and that this can be supported with eye-tracking measurements. This assumes professional subtitles are created following professional standards that provide instructions for subtitles which are more appropriate for reading. Among these sub-hypotheses, only two were confirmed (*Mean fixation duration* and *Attention shifts*) and one was partially confirmed (*Reception capacity*).

Table 104. Confirmation of sub-hypotheses for H_1: Type of subtitle

	Variable	Confirmation	
$H_{1.1}$	Reception capacity	(✓)	
$H_{1.2}$	Subtitle-reading effort	✗	
$H_{1.3}$	Self-reported comprehension	✗	
$H_{1.4}$	Attention allocation	✗	H1: not confirmed
$H_{1.5}$	Mean fixation duration	✓	
$H_{1.6}$	Skipped subtitles	✗	
$H_{1.7}$	Attention shifts	✓	

Considering these results, it is safe to assume that the reception of professional and non-professional subtitles in this study is not different at *all* levels of reception. There was no evidence that differences in the overall reading behavior correlated with the types of subtitle. Furthermore, the results for the self-reported measurements did not indicate that the type of subtitle was a relevant factor from the participants' perspective.

The mean fixation duration for the professional subtitles was significantly shorter than for the others. However, these differences might have been triggered by the layout

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of the subtitles on the screen. Since the other eye-tracking measurements did not vary significantly, I consider this to be a plausible explanation. Further research will be needed in order to test this hypothesis.

The significant difference between the professional and non-professional versions in terms of the number of attention shifts between the text and the image supports the professionally accepted guideline that a time span of four frames is needed between subtitles. According to Carroll and Ivarsson (1998), this span allows the human eye to realize there has been a change. The eye-tracking data in this study indicate that the time span between subtitles makes it possible for viewers to have a smoother reading process, alternating their fixations between the image and the subtitles. On the other hand, a shorter period between subtitles caused the participants to remain on the subtitle area for longer periods of time.

Surprisingly, the results for *Reception capacity* varied, with poorer score performances for the Iberian non-professional version only. The scores for the participants when watching the two other versions of the subtitles were similar, but they gave fewer correct answers to the content questionnaire after watching the Iberian non-professional subtitles. This means the hypothesis was only partially confirmed. Taking a closer look at the results, only the *Verbal attention* questions were lower: the *Narrative* and *Iconic attention* variables did not vary significantly according to the type of subtitle. This suggests the difference in scores is indeed related to the content of the subtitles and not to the other factors that constitute *Reception capacity*. Further, these results offer thought-provoking initial insights into viewers' performance as an indicator of quality.

Additionally, one main hypothesis was proposed based on the comparison between the two non-professional versions. H_3 stated: *Participants' reception scores will be higher with the non-professional subtitles produced in Spain (their own country) than with the non-professional subtitles produced in Latin America.* Three sub-hypotheses, related to self-reported questions and recall testing, were formulated guided by the assumption that the participants, being speakers of Iberian Spanish, would identify more and obtain better results with the Iberian version than with the Latin-American version.

Surprisingly, the results were the opposite: the scores for the Latin-American neutral version were higher than those for the Iberian version, and there were no significant differences in terms of the self-reported measurements, namely *Subtitle-reading effort* and *Self-reported comprehension*.

Table 105. Confirmation of sub-hypotheses for H_3: Type of non-professional subtitles

	Variable	Confirmation	
$H_{3.11}$	Reception capacity	✘	
$H_{3.12}$	Subtitle-reading effort	✘	H3: not confirmed
$H_{3.13}$	Self-reported comprehension	✘	

Does the users' level of proficiency in L2/L3 affect the reception of professionally and non-professionally subtitled audiovisual material?

This question was related to H_2: *Participants with a high level of proficiency in L2/L3 will be less dependent on subtitles than will participants with a low level of L2/L3.* In order to provide an answer, three sub-hypotheses were postulated based on the rationale that the participants with a high level of proficiency in English would look less at the subtitle area. The sub-hypotheses involved the variables *Attention allocation*, *Mean fixation duration*, and *Audience enjoyment*. The *Attention allocation* and *Audience enjoyment* hypotheses were confirmed, while only the *Mean fixation duration* on the image was significantly affected. Thus, based on the data for this research, the level of proficiency in L2/L3 does affect the reception of subtitled content, regardless of the subtitles, as suggested by the results for H_1.

Table 106. Confirmation of sub-hypotheses for H_2: Level of L2/L3

	Variable	Confirmation	
$H_{2.8}$	Attention allocation	✓	
$H_{2.9}$	Mean fixation duration	(✓)	H2: confirmed
$H_{2.10}$	Audience enjoyment	✓	

The participants in the high level of English and low level of English groups had very different behaviors. The participants with a low level of English fixated more and for longer on the subtitle area, as expected, and they skipped almost no subtitles. Additionally, these participants had a more homogeneous behavior. On the other hand, the participants in the high level of English group had more variation in their reading, with some participants exhibiting a behavior similar to that of the low level of English participants, and others displaying a completely opposite behavior, spending almost no time on the subtitles. In general, they had a lower average of fixations and duration of fixations on the subtitle area and they skipped almost a quarter of the subtitles.

However, this did not affect the mean fixation duration, which did not vary significantly between the two groups. One of the most relevant findings is that the level of L2/L3 affects the mean fixation duration on the image area but not that on the subtitle

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area. Since they fixate mostly on the image, the gaze of the participants with a high level of English remain at the center of the screen. They make more fixations but also allocate more time to the image area. On the other hand, the participants with a low level of English are constantly shifting their focus, which indicates a more segmented visualization. This points to one additional effect of subtitle reading: when participants fixate for longer on the subtitles, they make significantly shorter fixations on the image.

Although the participants' level of proficiency in English did not affect their self-reported comprehension, it did affect enjoyment. The scores for audience enjoyment are lower for participants in the low level of English group. Reading subtitles is seen as a bothersome action in this group and reduced the participants' enjoyment. During the interviews, the participants commented that they think the subtitles were cognitively demanding.

A subgroup of the high level of English group behaved in a manner different from all other participants. They managed to skip a large amount of the subtitles and looked at the subtitle area only on specific occasions, possibly to gather information that was undiscernible to them from the audio track. This group of viewers showed there is a degree of control on the viewer's side (d'Ydewalle et al. 1989). Interestingly, the group comprised participants who said they never used subtitles when watching audiovisual materials.

Do participants notice any difference between professional and non-professional subtitles?

Two sub-hypotheses were postulated based on the assumption that participants would feel more inclined towards the professional version and, when comparing the non-professional versions only, towards the Iberian non-professional version. One of the most surprising outcomes from the study was the participants' inability to identify the provenance of the subtitles. In terms of language, the Iberian versions (both professional and non-professional) and the Latin-American versions are clearly marked as belonging to the two language varieties. For instance, the Iberian version uses *vosotros* for translating *you*, while the Latin-American version uses *ustedes*. However, the participants did not point this out during the interviews. Some of them did comment that there are different versions of subtitles in Spanish on the Internet, namely the *Latin-*

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American version and the *Iberian* version, but they did not liken that situation to the subtitles they had just seen.

Table 107. Confirmation of Quantitative data sub-hypotheses: H_{14} and H_{15}

	Variable	Confirmation	
H_{14}	Inclination towards professional subtitles	✘	H14: not confirmed
H_{15}	Inclination towards Iberian non-professional subtitles	✘	H15: not confirmed

7.2. Complementary findings

Other quantitative variables included in the study as well as the qualitative data from the interviews provided additional results that could help advance not only research on non-professional subtitling, but also the field of reception studies in audiovisual translation.

First of all, this research has shown there are different type of subtitle-reading behaviors related to different variables that affect the way in which the participants read subtitles. All of these factors help shape the subtitle reading behavior. The most relevant one, as discussed above, is the level of proficiency in the source language. However, one element that also provided interesting insights was the participants' use of subtitling. As shown, the frequency with which participants used subtitles in everyday life correlated with different patterns of eye movements. Up to now, studies on reception resort to a crude classification of participants into two groups: viewers who are used to subtitles and viewers who are used to dubbing. The findings of this study indicate that a more detailed analysis of these variables could help explain participants' behavior.

The eye-tracking measurements also indicate differences in behavior related to the audiovisual input. Interestingly, the analyzed variables consistently showed the participants had more difficulty understanding one of the clips than the other two. This difficulty was reflected in an increased allocation of attention to the subtitle area.

Among participants with a high level of English, those who never use subtitles and fixated the least on the subtitle area had longer fixations when they looked at the subtitles. Most of the time their gaze was fixated on the image, but their deflections to the subtitle area, probably prompted by a difficulty in understanding the audio track, accounted for longer mean fixation durations. This might support the assumption that longer and more fixations can be used as indicators of cognitive effort (Saldanha and O'Brien 2013; Kruger et al. 2015).

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In line with the new patterns of behavior in the consumption of audiovisual material, this study has shown that the traditional division between dubbing and subtitling countries no longer holds, as previously pointed out by Chaume (2013) and Casarini (2014). Although in most cases the participants said that subtitling was not their preferred audiovisual translation modality, they were willing to put up with it in daily life due to a set of social and personal conditions, such as availability of the content, interest in language learning, or social engagement. Their decision-making process when choosing which translation mode to use has become more complex; having access to both dubbed and subtitled products, they are now more conscious of how to use them to their advantage or according to their needs.

Most of the participants had a negative image of non-professional subtitling but recognized there are varying degrees of quality. Some even mentioned they would try different subtitles if the ones they found first had spelling mistakes or were badly synchronized. It could thus be said that these viewers have some of the characteristics described as being typical of more active and proficient users of audiovisual content, and that this is affecting their general consumption habits.

7.3. Limitations of the research

Defining the research design is always a trade-off process. Including or excluding a method or a variable can help the researcher have a more solid design, while at the same time limit the generalizability of the findings. The scope of this study and the selected methodology constitute the first limitations of the study. This research explores the reception of only one type of subtitling: professional-amateur (pro-am) subtitles. The wide range of non-professional subtitling practices and the different types of communities make it almost impossible to generalize the findings. As shown by the subtitles in this study, one non-professional version achieved results similar to those of professional subtitles, while the other was ranked lower.

I decided to exclude the participants with a mid-level of proficiency in English in order to compare the extremes and reduce the number of people required for the study. However, looking back and considering the interesting findings provided by the differences in behavior, I can but wonder how those participants in the middle would have compared to those at the extremes. I nevertheless consider that this self-imposed limitation allowed me to see more clearly the differences in the behavior of the two

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extreme types of participants. Another element that could have yielded interesting results is the inclusion of a control group of native speakers of English. This would provide a point of comparison when analyzing eye movements, comprehension of content and degree of enjoyment.

Both the number of participants and the analyses performed are affected by the decision to include eye tracking among the methods. As thoroughly explained in Section 4.2, eye-tracking data provide detailed and mostly accurate measurements of the participants' eye movements. Such comprehensive logging of gaze information also means an onerous amount of raw data. The manipulation and processing of that data are challenging and time-consuming. Given that in audiovisual translation we still do not have specific software to assist in this process, most of the data manipulation, processing and analysis has to be done manually. Eye-tracking software is more advanced for the analysis of static input such as text, than dynamic input such as films. The demands of the data processing affect the number of participants that can be included in a given study, since the larger the sample, the larger the data the researcher has to process.

Considering the number of participants, I managed to include a fairly large sample. When compared with other eye-tracking studies in the field, it is one of the largest samples to date. Additionally, the data quality of the eye-tracking data was in general good, since I only had to exclude about 5% of the eye-tracking data due to poor quality. Nevertheless, here again the trade-off problem surfaces: in order to process the data for all my participants, I decided to rely on the distribution of attention measurements only. This is criticized by Kruger and Steyn (2014) since it lacks a detailed analysis of the individual subtitles.

Attention allocation measurements are based on the assumption that the fixations within the subtitle area should be considered attention dedicated to the subtitles. With this approach, the researcher draws two areas on the screen, one for the image and one for the subtitles. Both of them are kept active from the beginning to the end of the recordings. Kruger and Steyn (2014) disapprove of this because in most cases it involves a crude definition of the areas of interest and does not exclude the measurements obtained from the subtitle area when no subtitles are shown on the screen. Taking this into account, I ruled out the possible misleading effects of maintaining the subtitle area always active by testing the differences in the results between a subtitle area which is active from the beginning to the end of the recording

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and one that is activated and deactivated with the onset and offset of every subtitle. The differences between the two options were minimal. Further, due to parameters such as re-reading and latency, even if there is no subtitle shown on the screen, in some circumstances it could be argued that the viewer's gaze is directed to the subtitle area with the intention of reading the subtitles or that the gaze remained on the subtitle area waiting for the next subtitle to appear. More research is needed to test how this affects the measurements and to define whether it constitutes a limitation or not.

The analysis of individual subtitles was not considered viable for this study. As reported again by Kruger and Steyn (2014), this kind of analysis entails incredibly demanding manual work. Even checking a subsample of subtitles per participant could take a considerable amount of time and effort. Although it could yield interesting results, it is unfeasible in a project with a large sample and only one researcher. Hopefully, in the future, better tools will help explore specific features and make more detailed analyses, such as isolating those subtitles that are read by the participants with a high level of English in order to search for a pattern in their deflections.

In order to keep the *Clip* variable as controlled as possible, I decided to focus on one audiovisual genre only. As shown by the results, this goal was actually threatened by the fact that one of the clips turned out to be more cognitively demanding for the participants. This shows that even the selection of excerpts from the same product does not imply straightforward comparability. I still think that including excerpts from different genres or products would entail even more disparity and could pose a challenge when interpreting the results. Based on the outcome for the *Clip* variable, I now think a stricter selection process is necessary. Perhaps a set of pre-selected clips could be tested with people who fit the profile of the participants of the study. The participants in this pre-testing would watch the clips and rate how difficult they are to understand. Additionally, they could describe the content of the clip and pinpoint the salient narrative, verbal and iconic elements they can recall. These initial results would offer the researcher initial data to make a more informed decision when selecting videos for the experiment and preparing comprehension questionnaires.

The number of recall questions included in the questionnaire is also a limiting factor. Each type of information, namely *Narrative*, *Verbal* and *Iconic*, was tested based on two questions only, one open-recall question and one cued-recall question. The reduced number of questions responded mainly to the time constraints imposed. Each session combining the eye-tracking experiment and the interview lasted for about 45

minutes per participant. Including a longer questionnaire for each clip would have increased the duration of the session. Since the participants did not receive any payment, it would have been difficult to achieve the number of participants required had I asked them to give me more than one hour of their time.

The aim of this research was to approach the reception of the subtitles from the participants' point of view. It did not include an assessment of the subtitles according to professional standards or theoretical considerations. This choice could be seen as a limitation, depending on where you stand. In my case, I was more interested in discovering how the participants would assess and react to the translations. My goal was to draw some conclusions based on the results of the participants' performance and assessment.

Finally, it is necessary to recognize the inherent limitation of this type of experiment, the "observer's paradox" (Labov 1972). For the design of the project I wanted to test the use of subtitling in conditions similar to the participants' experience. In doing so, I decided to use a popular TV series that could be familiar to the participants. However, it is only safe to assume some participants do not feel at ease under experimental conditions. This was one of the reasons for randomizing the presentation of the subtitles. Additionally, after the pilot study and considering the feedback indicating a potentially higher awareness of the experimental conditions at the beginning of the session, I decided to include a short video clip from the same series with a twofold purpose: checking the calibration of the eye tracker and giving the participants some time to become used to the setting. The participants did not mention the setting or the eye tracker as stressful elements. Further, the main differences in measurement were caused by the excerpt that was in the second position, not the first one.

7.4. Applicability

This research aligns in various ways with Tymoczko's (2005) predictions about the trajectory of research in Translation Studies: it assumes the concept of translation can be extended to non-professional practices of translation that were fueled by the expansion and democratization of technology, while at the same time looks at translation as a result of an international social phenomenon. With that in mind, I hope to have contributed to Translation Studies in several ways:

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- Based on previous research, I have adopted and tested a methodology that allows for a holistic exploration of the reception of subtitled material. The addition of interviews to the more traditional combination of eye tracking and questionnaires has proved to provide insights into the social conditions that surround the consumption of translated audiovisual products. The data collected through the interviews support or question the findings from the other methods, which makes the overall conclusions more robust.

- Again in terms of methodological aspects, I have tried to be as meticulous as possible in the description of the methods deployed for the preparation, collection and processing of the eye-tracking data. One of the biggest problems I had was the lack of studies explaining the data collection and processing methods in detail. In order to fill this gap, I have covered the technical aspects extensively, with special emphasis on the eye-tracking quality assessment techniques and their application to research in audiovisual translation.

- The study has shown that professional and non-professional subtitles can be compared and that there is variation between non-professional subtitles, at least from the perspective of the users of the translation. These results come to complement the already growing literature that supports a range of applications of non-professional subtitling features to mainstream translation, translator training and Translation Studies. These applications range from translator training and the possibility of adapting and integrating non-professional mechanisms to professional translation practices, to the re-definition of the translation profession and of translation practice.

- Companies have decided to use optional glosses in anime DVDs to explain culture-bound terms for those users who are interested in them. In the same way, knowing that there are people with high proficiency in the source language who are capable of identifying what type of information they want to recover from the subtitles, it becomes possible to create different types of subtitles depending on the users' needs.

7.5.   Implications and avenues for future research

The present study constitutes the first attempt to explore the reception of professional and non-professional subtitles using a triangulation of methods. In that sense, it offers a new approach to non-professional subtitling and adds another layer of understanding. At the same time, it enlarges the field of reception studies.

I hope the findings motivate more systematic analyses of non-professional subtitling practices. The non-professional subtitling panorama is wide (O'Hagan 2009, 2012; Fernández Costales 2012; O'Hagan 2013) and includes many areas that are still uncharted. One of them is the adaptation of non-professional subtitling mechanisms and tools for translator training (Orrego-Carmona 2013). The development of translator competence could also benefit from the study of non-professional subtitling. Given that one of the non-professional subtitles in this study produced results similar to those of the professional subtitle version, future studies could analyze how non-professional translators actually develop translator competence (Harris 1977). The difference in the scores for the two non-professional subtitles included in this study, and the variation within non-professional subtitling communities in general commented on by many scholars seems to indicate that some conditions support the development of translator competence better than others. The identification of these aspects or circumstances could help advance our understanding of how translators can be trained.

Taking into account that the participants' performance in the test with one version of the non-professional subtitles was similar to their performance with the professional version, regardless of their subjective opinion on non-professional subtitling, one possible area for research is the exploration of the effects of people's negative predispositions or implicit theories. Would participants behave in the same way and obtain the same results it they knew the subtitles were non-professional?

From a general perspective on reception, there are some aspects that could be developed further in future studies. The differences in behavior between participants who are highly proficient in the source language of the content and the participants who have a low level of proficiency in the source language open up a completely new area for research. First, as mentioned, this research does not provide information about participants with a middling level of competence in English, even though they made up the biggest group of my initial sample. Exploring their behavior could provide interesting insights. Second, a detailed analysis of the fixations of the participants with a

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high level of English could yield information on the elements that trigger their deflections to the subtitle area. Learning about this could help in the development of subtitles tailored to viewers who are highly proficient in the source language but still require some degree of support. At the same time, it could benefit language learning by providing information on the needs of learners. This could be used to create subtitles that are more suitable to specific learning goals. Third, while I was collecting the data, I had the impression that participants in both groups reacted differently to the audio track. Having learned that reading subtitles actually affected self-reported comprehension, I think it would be interesting to explore the kind of cues that both groups take from the audio track. Even if they do not understand the linguistic information, the mere fact that there is some sound might have an effect on the participants. This is an unexplored area in Translation Studies.

One solution for overcoming the limitation on the number of participants imposed by eye tracking methods would be to combine questionnaires and eye tracking in a reception study structured in two complementary phases: a first stage using questionnaires with a large sample and a second stage collecting eye-tracking data from a sub-sample. The questionnaire stage would analyze the responses and repercussions of the material while the eye tracking would provide information on their reactions.

One variable that I did not expect would have an effect but that I now think is important is the layout of the subtitles. On the one hand, the participants commented on the layout of the subtitles as being one of the salient elements when judging the professionalism of the translation. On the other, it seems the layout also influenced the eye-tracking measurements. This could explain the cases in which the two non-professional versions give similar results but are different from the professional version. As shown in Figure 49, the layout is one aspect the two non-professional translations have in common. Future research could explore the effect of the subtitle layout on the participants' eye movements.

Finally, although it might look like a far-fetched assumption since it is out of the scope of this thesis, I think the participants' performance on reception capacity testing could be extended to be used as a type of quality assessment. The findings indicate the performance of participants in the verbal attention test hints at differences between the subtitles. The results were robust enough to show differences between the three types of subtitles the participants were exposed to. This adds yet another aspect that could be taken into account as part of quality assurance or translation assessment: user reception.

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Verbal attention was tested with only two questions, so the results should be taken with care. However, these initial results could help shape a quality-assessment process that involves the target users as raters of the translations. Much like the system put in place by Facebook to test its crowdsourced translation, testing audience reactions could confirm translation choices or decide among different options.

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Appendices

Appendix 1.   Consent form

Estudio sobre recepción de material audiovisual
Consentimiento informado del participante en la investigación
Código de Ética

El presente documento presenta en líneas generales el contexto del proyecto de investigación, así como los derechos de los participantes que aceptan colaborar con en el estudio. También expone las normas de recolección, manejo y archivo de los datos para que el participante tenga asegurados sus derechos fundamentales de confidencialidad.

Persona responsable del proyecto: David Orrego Carmona

Contacto: david.orrego.carmona@gmail.com, +34 633 770 930

Contexto general del proyecto

El proyecto de investigación para el cual pedimos su colaboración tiene una duración estimada de tres años. Corresponde a la investigación doctoral cuyos resultados serán presentados en forma de una tesis y artículos que se desprendan de ella. La investigación se desarrolla dentro del Intercultural Studies Group del Departamento de Estudios Ingleses y Alemanes de la Universitat Rovira i Virgili.

Objetivo del proyecto

Este proyecto tiene por objetivo el estudio del comportamiento de los espectadores en relación con material audiovisual producido en los Estados Unidos y distribuido ampliamente en España. Con este fin, los datos se recolectarán por medio de la monitorización y grabación de los movimientos oculares de los espectadores, la grabación de las respuestas a unos cuestionarios de comprensión y la grabación de una entrevista posterior al experimento.

Confidencialidad y condiciones de archivo de los datos

Datos personales: Los datos personales (nombre, edad, contacto, residencia) de los participantes sólo serán gestionados por David Orrego Carmona y únicamente para efectos de contacto urgente. Tales datos serán salvaguardados en todo momento y no se compartirán con ninguna persona ajena al proyecto o institución. Para efectos de procesamiento y análisis de los datos, los participantes serán identificados con una referencia numérica. Dichas referencias se mantendrán en archivos independientes.

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Grabación del experimento: La grabación del experimento siempre se mantendrá en su formato original y no será divulgada por ningún otro medio (como la Internet) o compartida con ninguna otra persona ajena al proyecto o institución.

Utilización de los datos

Los datos serán recogidos únicamente con fines científicos y sólo serán utilizados para efectos de la investigación científica en el marco del proyecto que se acaba de describir.

Derechos del participante

- El participante tiene el derecho a retirarse del experimento en cualquier momento, tanto durante como después de la recolección de datos.

- El participante tiene derecho a acceder a los datos del experimento en cualquier momento y a solicitar una copia de todos los documentos (reportes, artículos, carteles, etc.) producidos con base en los datos recolectados.

- El participante tiene derecho a presentar una queja oficial en caso de que se sienta afectado o lesionado en cualquiera de los experimentos o por la conducta del investigador. Para ello, el participante debe ponerse en contacto con David Orrego Carmona por correo electrónico (david.orrego.carmona@gmail.com). En caso de que quiera presentar una queja relativa a la conducta de David Orrego Carmona, el participante tiene derecho a dirigirse por escrito al profesor Dr. Anthony Pym (anthony.pym@urv.cat)

_____

Comprendo y acepto todos los parámetros expuestos en este documento, por lo que acepto participar en el experimento de recogida de datos para el estudio sobre recepción de productos audiovisuales.

Firmando este documento consiento mi participación en el estudio.

Tarragona, _____ de _____ de ـ____

Nombre: _____

Firma: _____

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Appendices

Appendix 2.   Subtitles used for the eye-tracking session

Clip 1: The Big Bang Theory, season 2, episode 4 "The Griffin Equivalency"

Transcription	DVD version	Argenteam Version	TusSeries Version
Let's see, Raj was the *kung pao* chicken.	Para Raj el pollo Kun Pao...	Veamos, Raj tenía el pollo Kung Pao.	Veamos, el pollo kung pao era para Raj.
-I'm the dumplings. -Yes, you are.	- El cerdo para mí. - Cuando tú quieras.	- Yo tenía los bollitos. - Sí que los tienes.	- Los raviolis chinos son míos. - Sí que los son.
Creepy, Howard.	Me das escalofríos.	Das miedo, Howard.	Asqueroso, Howard.
Creepy good or creepy bad?	¿En el buen sentido o en el malo?	¿Miedo bueno o miedo malo?	¿Para bien o para mal?
-Who was the shrimp with lobster sauce? -That would be me.	¿Para quién son las gambas en salsa de langosta? Son para mí.	¿Quién tenía camarones con salsa de langosta? Yo. Ven con papá, deleite anti kosher.	¿Para quién eran las gambas con salsa de langosta? Para mí. Ven con papá, delicia inapropiada.
Come to papa, you un-kosher delight.	Venid con papá, delicias no kosher.		
I'm not necessarily talking to the food.	No creas que solo me estoy refiriendo a la comida.	No necesariamente estoy hablándole a la comida.	No estoy hablando necesariamente con la comida.
Sit over there.	Siéntate allí.	Siéntate allá.	Siéntate ahí.
Sit over there.	Siéntate aquí.	Siéntate allá.	Siéntate ahí.
-Baby wipe? -Why do you have?	- ¿Toallita de bebé? - ¿Por qué haces...?	¿Toallas para bebé? - ¿Por qué tienes-- - ¡No, no preguntes!	- ¿Una toallita de bebé? - ¿Por qué tienes...?
-No, don't ask. -No, don't, don't.	- No, no le... - ¡No, no, no!		- ¡No preguntes! - ¡No, no, no!
I'll tell you why.	Te lo diré.	Te diré por qué.	Te diré por qué.
I had to sanitize my hands because the university...	Tengo que desinfectarme las manos porque en la universidad	Tuve que higienizarme las manos porque la universidad...	Tuve que desinfectar las manos porque la universidad
...replaced the paper towels in the restrooms with hot-air blowers.	...han sustituido el papel del lavabo por secadores de aire.	...cambió las toallas de papel de los baños por secadores de aire caliente.	reemplazó las toallas de papel de los servicios por secadores de aire caliente.
I thought the blowers were more sanitary.	Creía que los secadores eran más higiénicos.	Pensé que los secadores eran más higiénicos.	Creía que los secadores eran más higiénicos.
-Why? -Really, don't.	- Por favor, no... - ¿Por qué sigues?	- En serio, no lo hagas. - ¿Por qué?	- De verdad, no... - ¿Por qué...?
Hot-air blowers are incubators and spewers of bacteria and pestilence.	Los secadores son incubadoras... ...que escupen ciertos de bacterias y pestilencia.	Los secadores de aire caliente son incubadoras que escupen... ...bacterias y pestilencia.	Los secadores de aire caliente son incubadores y lanzadores de bacterias y pestilencia.
Frankly, it'd be more hygienic if they had a plague-infested gibbon...	La verdad, sería más higiénico que un mono con la peste...	Sería más higiénico si hicieran que un simio apestado...	Francamente, sería más higiénico
...sneeze my hands dry.	...me secara la mano a estornudos.	...estornude para secarme las manos.	si tuviesen para secar las manos el estornudo de un gibón.
Hey, guys, I just got the most amazing new--	Hola, chicos. Acabo de oír una cosa increíble.	Hola, chicos, tengo una noticia increíbl--	Hola, chicos, acabo de recibir la noticia más increíble...
Gosh, Raj do you think you'll ever be able to talk in front of me without being drunk?	¿Crees que algún día podrás hablar delante de mí... ...sin tener que estar borracho?	Dios, Raj, ¿crees que alguna vez podrás hablar frente a mí sin estar ebrio?	Dios, Raj, ¿crees que alguna vez serás capaz de hablar delante de mí sin estar borracho?
Okay, well, I'll just go eat by myself.	Bueno, entonces me iré a comer a mi casa.	Bien, me iré a comer sola.	Vale, bueno, me voy a comer sola.
-Penny, you don't have to do that. -Oh, it's okay.	- No tienes por qué hacer eso. - No, tranquilo.	Penny, no hace falta. Está bien, entre él que no habla, él que habla y él...	Penny, no tienes que hacerlo. No, está bien, entre que él no habla, él habla y él...
Between him not talking,	Entre él que no habla, él que sí		

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him talking, and him...	habla y él...		
...I'm better off alone.	...estaré mejor sola.	...estoy mejor sola.	Estoy mucho mejor sola.
So goodbye, you poor, strange little man.	Adiós, pobre y extraño pequeño.	Adiós, pobre hombrecito raro.	Adiós, pobre y extraño hombrecito.
-She's so considerate.	- Es muy considerada.	Es tan considerada.	Qué considerada.
-So, what's your news?	- ¿Qué has oído?	¿Cuál es la noticia?	¿Y qué noticias tienes?
Remember that little object I spotted beyond the Kuiper belt?	¿Recordáis el objeto planetario que vi más allá del cinturón de Kuiper?	¿Recuerdan ese objeto planetario que descubrí cerca del Cinturón de Kuiper?	¿Recordáis aquel pequeño objeto planetario que avisté más allá del Cinturón de Kuiper?
Oh, yeah, 2008-NQ sub-17.	Ah, sí. El 2008-NQ sub-17	Sí, 2008-NQ Sub-17.	Sí, 2008-NQ Sub-17.
Or as I call it, Planet Bollywood.	Yo lo llamo "Planet Bollywood".	O, como yo lo llamo, "Planeta Bollywood".	O como yo lo llamo, Planet Bollywood.
Anyway, because of my discovery...	A causa de ese descubrimiento...	En fin, por mi descubrimiento, la revista People me nombrará...	Bueno, por mi descubrimiento, la revista People va a nombrarme
...*People Magazine* is naming me one of their 30 Under 30 to Watch.	...la revista *People* me tiene entre los 30 de menos de 30 para observar.	...uno de los 30 de menos de 30, para observar.	uno de sus 30 por debajo de 30 a vigilar.
-Raj, that's incredible. -Congratulations.	- ¡Raj, es estupendo! - ¡Enhorabuena!	- Felicitaciones. - Eso es increíble.	- Felicidades. - Es increíble.
Excuse me, the 30 what under 30 what to watch what?	Disculpa. ¿Los treinta qué de menos de treinta qué para observar qué?	Disculpa...	Perdona,
		...¿30 qué de menos de 30 qué para observar qué?	¿30 qué por debajo de 30 qué a vigilar qué?
30 visionaries under 30 years of age to watch	Treinta visionarios de menos de treinta años para observar...	30 visionarios de menos de 30 años...	30 visionarios por debajo de 30 años de edad a vigilar
...as they challenge the preconceptions of the fields.	...cómo desafían las ideas preconcebidas de su campo.	...para observar como desafían las ideas preconcebidas de sus campos.	cómo desafían las preconcepciones de sus campos.
If I had a million guesses, I never would have gotten that.	Ni en un millón de años lo habría adivinado.	De un millón de posibilidades nunca habría adivinado eso.	Si lo hubiera intentado un millón de veces, nunca se me habría ocurrido eso.
It's pretty cool. They've got me in with a guy doing something about hunger in Indonesia...	Y es muy guay, estaré con un tío que intenta eliminar el hambre en Indonesia...	Es genial, comparto con un tipo... ...que hace algo por el hambre en Indonesia...	Está chulísimo. Me metieron con un tipo que está haciendo algo por el hambre en Indonesia,
...and a psychotherapist who's using dolphins to rehabilitate prisoners...	...y con un psicólogo que usa delfines para rehabilitar a los presos...	...y un psicoterapeuta que usa delfines para rehabilitar prisioneros...	y una psicoterapeuta que usa delfines para rehabilitar prisioneros,
...and Ellen Page, star of the charming independent film *Juno*.	...y con Ellen Page, la estrella de la preciosa película independiente *Juno*.	...y Ellen Page... ...estrella de la encantadora película independiente "Juno."	y Ellen Page, protagonista de la encantadora película adolescente, Juno.
I'd so do her.	Me encantaría hacérselo.	Yo se lo haría.	Me encantaría tirármela.
You'd do the dolphins.	Tú se lo harías a los delfines.	Tú se lo harías a los delfines.	Tú hasta te tirarías a los delfines.
Do I get an honorable mention	¿Mencionarás que...	¿Tendré una mención honorífica por diseñar...	¿Voy a tener una mención de honor por diseñar
for designing the telescope camera mounting bracket you used?	...yo diseñé el soporte en el que va montado el telescopio que usaste?.	...el soporte para la cámara del telescopio que usaste?	el soporte de montaje de la cámara del telescopio que usaste?
Sorry, it's not part of my heartwarming and personal narrative...	Lo siento, no es parte de mi desgarradora historia personal...	Lo siento pero no entra en mi enternecedora historia personal...	Lo siento, no es parte de mi alentadora y personal historia
...in which a humble boy from New Delhi...	...en la que un niño humilde de Nueva Delhi...	...en la cual un chico humilde de Nueva Delhi...	en la cual un humilde chico de Nueva Delhi superó la pobreza
...overcame poverty and prejudice...	...supera la pobreza y los prejuicios...	...superó la pobreza y los prejuicios...	

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...and journeyed to America to reach for the stars.	...y viaja hasta Estados Unidos para alcanzar las estrellas.	...y viajó a Estados Unidos para alcanzar las estrellas.	y los prejuicios y viajó a Estados Unidos para alcanzar las estrellas.
Poverty? Your father's a gynecologist. He drives a Bentley.	¿Pobreza?. Tu padre es ginecólogo y tiene un Bentley.	¿Pobreza? Tu padre es ginecólogo... ...y tiene un Bentley.	¿Pobreza? Tu padre es ginecólogo. Conduce un Bentley.
It's a lease.	Es un *leasing*.	Es alquilado.	Es alquilado.
I'm confused. Was there some sort of peer-review committee...	Estoy confuso. ¿No hubo una especie de comité de sabios...	Estoy confundido. ¿Hubo algún tipo de comité científico...	Estoy confuso. ¿Había algún tipo de jurado de notables
...to determine which scientists would be included?	... para decidir qué científicos se incluirían?.	...para determinar qué científicos serían incluidos?	para determinar qué científicos debían ser incluidos?
Peer review? It's *People Magazine*. People picked me.	¿Comité de sabios?. Es la revista *People*. Me eligieron ellos.	¿Comité científico? Es la revista People. La gente me seleccionó.	¿Jurado de notables? Es la revista Gente. Me escogió la gente.
-What people? -The people from *People*.	- ¿Ellos, quiénes?. - Las personas de *People*.	- ¿Qué gente? - La gente de People.	- ¿Qué gente? - La gente de Gente.
What? Yeah, but exactly who are these people?	Pero ¿quienes son esas personas exactamente?.	Sí, pero ¿quién es esa gente?	Sí, ¿pero quién es exactamente esta gente?
What are their credentials? How are they qualified?	¿Y cuáles son sus credenciales?. ¿Están cualificadas?.	¿Cuáles son sus referencias? ¿Cómo están calificados?	¿Cuáles son sus credenciales? ¿Cómo están cualificados?
What makes accidentally noticing a hunk of rock...	¿Cómo es que ver accidentalmente un trozo de roca...	¿Por qué el hallazgo casual de un pedazo de roca...	¿Qué hace accidentalmente destacable un trozo de roca
...that's been traipsing around the solar system for billions of years...	... que lleva cruzando el sistema solar millones de años...	...que lleva millones de años dando vueltas por el sistema solar...	que ha estado dando vueltas alrededor del Sistema Solar
...more noteworthy than any other scientific accomplishment made by someone under 30?	...es más importante que cualquier... ...otro descubrimientno científico hecho por otro menor de 30 años?.	...se destaca más que cualquier otro logro científico... ...de alguien de menos de 30?	durante miles de millones de años más digno de mención que cualquier otro logro científico conseguido por alguien menor de 30 años?
Boy, I'll bet Ellen Page's friends aren't giving her this kind of crap.	¡Vaya! Seguro que los amigos de Ellen Page no le irán con gilipolleces.	Seguro que los amigos de Ellen Page no la tratan así.	Tío, apuesto a que los amigos de Ellen Page no le están dando este coñazo.
You proud of yourself?	¿Estás orgulloso de ti mismo?.	¿Estás orgulloso de ti mismo?	¿Estás orgulloso de ti?
In general, yes.	En general, sí.	En general, sí.	Por lo general, sí.

Clip 2: The Big Bang Theory, season 2, episode 11 "The Bath Item Gift Hypothesis"

Transcription	DVD Version	Argenteam Version	TusSeries
Your argument is lacking in all scientific merit.	Tu argumento carece de cualquier mérito científico.	A tu argumento le falta mérito científico.	Tus razones carecen totalmente de mérito científico.
It is well established	Ha quedado demostrado...	Está establecido que Superman limpia su uniforme volando hacia el Sol...	Está bien establecido que Superman limpia su uniforme
...Superman cleans his uniform by flying into Earth's yellow sun...	... que Superman limpia su uniforme volando hacia nuestro amarillo sol...		volando al interior del sol amarillo de la Tierra,
...which incinerates any contaminate matter...	...que incinera la materia contaminante...	...que incinera cualquier materia contaminante...	que incinera cualquier materia contaminante
...and leaves the invulnerable Kryptonian fabric unharmed and daisy fresh.	...dejando el invulnerable tejido kryptoniano ileso y con olor a fresco.	...y deja la tela kryptoniana impecable y suave.	y deja la invulnerable tela kryptoniana indemne y oliendo a rosas.
What if he gets something Kryptonian on it?	¿Y si se mancha con algo kryptoniano?	¿Y qué si tiene algo kryptoniano en ella?	¿Y si le cae algo kryptoniano encima?
-Like what? -I don't know. Kryptonian mustard.	- ¿Como qué? - ¿Qué sé yo? Mostaza kryptoniana.	¿Cómo qué? No lo sé. Mostaza kryptoniana.	¿Como qué? No sé. Mostaza kryptoniana.
I think we can safely assume that all Kryptonian condiments were destroyed...	Podemos suponer que los condimentos kryptonianos se destruyeron...	Creo que podemos asumir que todos los condimentos kryptonianos...	Creo que podemos asumir sin temor a equivocarnos que todos los condimentos kryptonianos fueron destruidos
...when the planet Krypton exploded.	...al explotar el planeta Kryptón.	...fueron destruidos cuando el planeta Krypton explotó.	cuando el planeta Krypton explotó.
Or it turned into mustard Kryptonite.	O se convertiría en mostaza kryptoniana.	O se volvió kryptonita mostaza, la única forma...	O se convirtió en kryptonita de mostaza,
The only way to destroy a rogue Kryptonian hot dog threatening Earth.	La única forma de destruir a un perrito caliente kryptoniano que nos amenazara.	...de destruir a una salchicha kryptoniana amenazando la Tierra.	la única forma de destruir un perrito caliente kryptoniano hostil que amenaza la Tierra.
Raj, please, let's stay serious here.	Raj, por favor, estamos hablando en serio.	Raj, por favor, mantengámonos serios.	Raj, por favor, seamos serios.
Superman's body is Kryptonian, therefore his sweat is Kryptonian.	Superman es kryptoniano, por lo que su sudor es kryptoniano.	El cuerpo de Superman es kryptoniano, por lo que su sudor es kryptoniano.	El cuerpo de Superman es kryptoniano, por tanto su sudor es kryptoniano.
Yeah, what about Kryptonian pit stains?	Sí. ¿Y las manchas de los sobacos?	¿Qué hay de las manchas de sudor kryptoniano?	Sí, ¿qué pasa con las manchas de sudor en las axilas?
Superman doesn't sweat on Earth.	Superman no suda en la Tierra.	Superman no suda en la Tierra.	Superman no suda en la Tierra.
Okay. He's invited for dinner in the Bottle City of Kandor.	Vale, va a cenar a la ciudad embotellada de Kándor.	Lo invitan cenar en la Ciudad Botella de Kandor.	Vale, lo invitan a cenar a la Ciudad Embotellada de Kandor.
He miniaturizes himself, enters the city where he loses his superpowers.	Se hace diminuto, entra en la botella y pierde sus súper poderes.	Se miniaturiza, entra a la ciudad y pierde sus superpoderes.	Se miniaturiza a sí mismo, entra en la ciudad donde pierde sus superpoderes.
Now, before dinner, his host says, "Who's up for a little Kryptonian tetherball"?	Antes de cenar, el anfitrión dice, "¿Un partido de "kryptoból? "	Antes de cenar, su anfitrión pregunta si alguien quiere jugar pelota.	Ahora, antes de cenar, su anfitrión dice: ¿Quién se apunta a un poco de tetherball?
Superman says "Sure", works up a sweat, comes back to Earth,	Superman juega, suda y vuelve a la Tierra con el traje manchado...	Superman acepta, suda un poco, regresa a la Tierra...	Superman dice: "Claro", suda, vuelve a la Tierra,
his uniform now stained with indestructible Kryptonian perspiration.	...de indestructible sudor kryptoniano.	...con el uniforme sudado con indestructible sudor kryptoniano.	ahora su uniforme está manchado con transpiración kryptoniana indestructible.
Boo ya.			Chúpate ésa.

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Superman would have taken his uniform to a Kandorian dry-cleaner...	Superman llevaría su traje a una tintorería andorina...	Superman habría llevado su uniforme a una lavandería kandoriana...	Superman habría llevado su uniforme
...before he left the Bottle.	...antes de salir de la ciudad.	...antes de dejar la botella.	a una tintorería kandoriana antes de abandonar la Botella.
Kandorian dry-cl... I give up. You can't have a rational argument with this man.	¿A una tintorería kandori...? No se puede tener una discusión racional con él.	Lavandería kando-- Me rindo.	Tintorería kand... Me rindo.
		No se puede tener una discusión racional con este hombre.	No se puede tener una discusión racional con este hombre.
Hey, isn't that the guy who won the MacArthur Genius Grant last year?	Oye, ¿no es el tío que ganó el premio McArthur al genio el año pasado?	¿No es ese el tipo que ganó la beca MacArthur el año pasado?	Oye, ¿ése no es el tío que ganó la Beca Genio MacArthur el año pasado?
No, not all at once.	¡No, no le miréis todos!	No, no todos a la vez.	No, todos a la vez no.
- Then how? - Leonard.	- ¿Y qué hacemos? - Leonard.	- ¿Entonces cómo? - Leonard.	- ¿Entonces cómo? - Leonard.
Now, Raj.	Ahora Raj.	Ahora, Raj.	Ahora, Raj.
Now, Sheldon.	Y ahora Sheldon.	Ahora, Sheldon.	Ahora, Sheldon.
I didn't get a good look. Can I go again?	- No le he visto bien, ¿puedo repetir?	No lo vi bien. ¿Puedo ir de nuevo?	No lo vi bien. ¿Puedo volver a mirar?
No.	- No.	No.	No.
-It's David Underhill. So what? -So what?	- Es David Underhill. ¿Y qué? - ¿Y qué?	Es David Underhill. ¿Y qué? ¿Y qué?	Es David Underhill. ¿Y qué? ¿Y qué?
His observation of high-energy positrons has provided the first conclusive evidence...	Su observación de los positrones de alta energía proporcionó la prueba...	Su observación de los positrones de alta energía fue la primera evidencia...	Su observación de positrones de alta energía ha proporcionado la primera prueba concluyente
...for the existence of galactic dark matter.	...de que hay materia oscura galáctica.	...conclusiva de la existencia de materia oscura galáctica.	de la existencia de materia oscura galáctica.
I have two words for you. The first is "big," the other's "whoop."	Solo diré dos palabras. Una es "vaya" y la otra "bobada".	Tengo dos palabras para ti: "gran" y "cosa".	Tengo dos palabras para ti. La primera es "qué", la otra es "pasada".
It is a big whoop. It made almost all the work you've done...	No es una bobada. Hizo que casi todo tu trabajo resultara prácticamente inútil.	Es una gran cosa.	Sí que es una pasada.
...since you've been here completely useless.		Hizo que casi todo el trabajo que has hecho...	Hizo que casi todo el trabajo que has hecho
		...desde que estás aquí sea complemente inútil.	desde que estás aquí sea completamente inútil.
- Did not. - Did, too.	- No. - Claro que sí.	- No lo hizo. - Sí lo hizo.	- No. - Sí.
Did... Okay, maybe some of it, but...	Vale, puede que un poquito, pero...	No lo... Bueno, quizás en parte, pero...	No... Vale, puede que un poco, pero...
Look, the guy was just in the right place, at the right time...	Estaba en el sitio adecuado en el momento justo...	El tipo estaba en el lugar indicado en el momento indicado...	Mirad, el tío estaba en el lugar adecuado, en el momento adecuado,
with the right paradigm-shifting reinterpretation of the universe.	...con la correcta reinterpretación paradigmática del universo.	...con la reinterpretación del universo que cambiaría el paradigma indicada.	con la reinterpretación del universo que cambia un paradigma adecuada.
He got lucky.	Tuvo suerte.	Tuvo suerte.	Tuvo suerte.
In more ways than one.	Y no solo eso.	En más de una forma.	En más de un sentido.
He's a very handsome man.	- Es un hombre muy guapo.	Es un hombre muy apuesto.	Es un hombre muy guapo.
Doesn't do anything for me.	- A mí no me gusta nada.	No me hace nada.	No es mi tipo.
If I was gonna go that way, I'm more of a Zac Efron kind of guy.	Si me decidiera por eso, me iría más Zack Efron, la verdad.	Si fuese por ese camino, me gusta más el estilo de Zac Ephron.	Si fuera de esos, soy más del tipo de Zac Ephron.
Oh, yeah, like you have a shot with Zac Efron.	Como si Zack Efron fuera a mirarte.	Claro, como si tuvieses una oportunidad con Zac Ephron.	Sí, como que fueses a tener una oportunidad con Zac Ephron.
Excuse me. Are you Leonard Hofstadter?	Disculpad. ¿Eres Leonard Hofstadter?	Disculpa, ¿eres Leonard Hofstadter?	Disculpa... ¿Eres Leonard Hofstadter?

- Yeah. - I'm David Underhill.	- Sí. - Soy David Underhill.	- Sí - Soy David Underhill.	- Sí. - Soy David Underhill.
- Yeah. Heh, heh.	Claro.	Sí.	Sí...
Yeah, Dr. Gablehauser said if I wanted to...	El doctor Gablehauser dijo que si quería trabajar en el laboratorio...	El Dr. Gablehauser me dijo que si quería preparar algo en el laboratorio...	Sí, el Dr. Gablehauser dijo que si quería
...set something up in the photomultiplier lab,		...fotomultiplicador, me podrías dar una mano.	montar algo en el laboratorio del tubo fotomultiplicador
...that you'd be able to give me a hand?	... podrías echarme una mano.		que me echarías una mano.
-You wanna work with me?	- ¿Quieres trabajar conmigo?	¿Quieres trabajar conmigo?	¿Quieres trabajar conmigo?
Well, if you have a little time, yeah.	- Si tienes tiempo, sí.	Si tienes un poco de tiempo, claro.	Bueno, si tienes un poco de tiempo, sí.
Wow, yeah, sure. Yeah, no problem.	¡Vaya! Claro. No hay problema.	Sí, claro. Sí, no hay problema.	Sí, claro. Sí, sin problema.
Here's my home number. Here's my cell.	Ten el teléfono de mi casa y mi móvil, el de mi despacho...	Este es el número de mi casa. El de mi teléfono móvil. El de mi oficina.	Éste es el número de mi casa. Éste es el de mi móvil.
Here's my office.			Éste es el de mi despacho.
Here's my parents' number up in New Jersey.	...el teléfono de mis padres en Nueva Jersey.	El de mis padres en Nueva Jersey.	Éste es el número de mis padres en Nueva Jersey.
They always know how to reach me.	- Saben dónde encontrarme. - Vale.	Siempre saben dónde encontrarme.	Siempre saben cómo encontrarme.
- So... - Okay.			- Así que... - Vale.
Congratulations on the MacArthur Grant, by the way. Big fan.	Enhorabuena por el premio McArthur, por cierto. Soy tu admirador.	Felicitaciones por la beca MacArthur. Soy un gran admirador.	A propósito, felicidades por la Beca MacArthur. Soy un gran admirador.
Thanks. I'll call you.	Gracias. Te llamaré.	Gracias. Te llamaré.	Gracias. Ya te llamaré.
Okay. Bye-bye!	Vale. Hasta pronto.	Bien. ¡Adiós!	Vale. ¡Adiós!
What are you looking at? You've never seen a hypocrite before?	¿Qué miráis? ¿Es que nunca habéis visto a un hipócrita?	¿Qué? ¿Nunca han visto a un hipócrita?	¿Qué estáis mirando? ¿Nunca habíais visto antes un hipócrita?

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Clip 3: The Big Bang Theory, season 2, episode 15 "The Maternal Capacitance"

Transcription	DVD Version	Argenteam Version	TusSeries Version
So, Dr. Hofstadter, Leonard rarely talks about	Bueno, doctora Hofstadter... ...Leonard rara vez habla del increíble éxito que tienen sus hermanos.	Así que, Dra. Hofstadter, Leonard raramente habla...	Dra. Hofstadter, Leonard habla poco
his incredibly successful brother and sister.		...sobre sus increíblemente exitosos hermanos.	de sus increíblemente exitosos hermanos.
Please, don't go there, Howard.	- Por favor, no, Howard. - Yo tengo entendido que...	Por favor, no vayas allí Howard.	Por favor, no sigas, Howard.
I understand that, unlike Leonard,		Entiendo que...	Entiendo que, a diferencia de Leonard,
they're at the top of their respective fields.	...a diferencia de Leonard, están en la cumbre de sus respectivas carreras.	...a diferencia de Leonard, están en lo más alto de sus respectivos campos.	son punteros en sus campos.
Boy, you suck.	Me das asco.	Vaya, apestas.	Tío, das asco.
Well, Leonard's younger brother, Michael, is a tenured law professor at Harvard,	Bueno, su hermano pequeño, Michael, es catedrático de derecho en Harvard...	El hermano menor de Leonard, Michael... ...es profesor titular de leyes en Harvard...	Bueno, Leondard es el pequeño, Michael es profesor titular de Harvard,
and his sister just successfully grew a human pancreas in an adolescent gibbon.	...y su hermana acaba de hacer crecer un páncreas humano en un gibón.	...y su hermana acaba de hacer crecer con éxito... ...un páncreas humano en un simio adolescente.	y su hermana acaba de crear con éxito un páncreas humano en un gibón adolescente.
So, she's close to curing diabetes?	Entonces está a punto de curar la diabetes.	¿Entonces está cerca de curar la diabetes?	¿Así que está cerca de curar la diabetes?
Why else would you grow a pancreas in a tenaged gibbon?	¿Por qué iba a hacer crecer un páncreas en un gibón si no?	¿Por qué otro motivo harías crecer un páncreas humano en un simio adolescente?	¿Por qué si no haría crecer un páncreas en un gibón adolescente?
Wow, you must be very proud.	Vaya, estará usted muy orgullosa.	Debe estar muy orgullosa.	Vaya, tiene que estar muy orgullosa.
Why? They're not my accomplishments.	¿Por qué? Sus éxitos no son míos.	¿Por qué? No son mis logros.	¿Por qué? No son mis logros.
I have to urinate.	Tengo que ir a orinar.	Tengo que orinar.	Tengo que orinar.
Why are you doing this?	- ¿Por qué me estás haciendo esto? - Sabes las reglas...	- ¿Por qué estás haciendo esto? - Ya conoces las reglas.	¿Por qué haces esto?
You know the rules. You brought your mom to work. You must suffer.	...si traes a tu madre al trabajo debes sufrir.	Trajiste a tu madre al trabajo. ¡Debes sufrir!	Conoces las reglas. Trajiste a tu madre al trabajo. Tienes que sufrir.
Leonard, I had no idea your siblings were so much more successful than you.	No tenía ni idea de que tus hermanos tuvieran mucho más éxito que tú.	No tenía idea que tus hermanos fueran tanto más exitosos que tú.	Leonard, no tenía ni idea que tus hermanos tenían mucho más éxito que tú.
Yeah, you're like the Jar Jar Binks of the Hofstadter family.	Sí, eres como el Jar Jar Binks de la familia Hofstadter.	Sí. Eres como el Jar Jar Binks de la familia Hofstadter.	Sí, eres como el Jar Jar Binks de la familia Hofstadter.
Meesa think yousa lookin' so, so sad.	Misa piensa tusa mucho triste estás.	Oh, misa cree que tú tives mu mu triste.	Misa piensa que tusa pareces muy muy triste.
You know, rather than mock me, my friends might realize that this is difficult	En lugar de burlarse... ...mis amigos deberían ver lo difícil que es esto para mí e intentar ayudarme.	En vez de burlarse de mí, mis amigos podrían darse cuenta...	Mejor que burlarse, mis amigos podrían darse cuenta que esto es difícil
and try to help me through it.		...que esto es difícil y tratar de ayudarme a atravesarlo.	y ayudarme a superarlo.
Nope, I think mocking you is more fun.	No, burlarse es mucho más divertido.	No, creo que burlarnos de ti es más divertido.	No, creo que reírse de ti es más divertido.

Next time, don't yousa bring mama to work. Okee-day?	Otra vez tusa no traes mamá al trabajo, ¿deee acueeerdo?	Próxima vez, vosa no traigasi madre al trabajo. ¿Di acuerdo?	La próxima vez, tusa no traigas a mamá al trabajo. ¿Vale?
That was fast.	Qué rapidez.	Eso fue rápido.	Fuiste rápida.
The middle stall was occupied. I'll have to try again later.	El retrete del medio estaba ocupado, tendré que volver luego.	El compartimiento del centro estaba ocupado. Tendré que intentarlo de nuevo más tarde.	El compartimento del medio estaba ocupado. Lo intentaré luego.
That's totally understandable.	Es comprensible. Al vaciar la vejiga, como en el negocio inmobiliario...	Es totalmente comprensible.	Es totalmente comprensible.
In bladder voiding, as in real estate, it's location, location, location.	...lo fundamental es situación, situación, situación.	En el vaciado de vejiga, así como en bienes raíces... ...todo es ubicación, ubicación, ubicación.	En una vejiga vacía, como en bienes inmuebles, posición, posición, posición.
So, where were we?	¿Por dónde íbamos?	- Bien, ¿en qué estábamos? - Howard vive con su madre...	¿Dónde estábamos?
Howard lives with his mother and Raj can't speak	Howard vive con su madre y Raj no puede...	...y Raj no puede hablarle a las mujeres a menos que esté ebrio. Ve.	Howard vive con su madre y Raj no puede hablarle con
to women unless he's drunk. Go.	...hablar con una mujer sin estar borracho.		las mujeres si no está borracho. Adelante.
That's fascinating. Selective mutism is quite rare.	Es fascinante. El mutismo selectivo es algo poco frecuente.	Eso es fascinante. El mutismo selectivo es muy raro.	Esto es fascinante. El mutismo selectivo es muy raro.
On the other hand, an adult Jewish male living with his mother	Por otra parte, el que un judío adulto viva con su madre es tan común...	Por otro lado, un hombre judío adulto viviendo con su madre es tan común...	Por otro lado, un macho judío adulto viviendo con su madre
is so common it borders on sociological cliché.	... que es casi un cliché sociológico.	...que bordea el cliché sociológico.	es tan común que raya el cliché sociológico.
It's just temporary. I pay rent.	Es temporal y pago un alquiler.	Es temporal, pago renta.	Es temporal. Pago un alquiler.
He lives in the same room where his bassinet was.	Vive en el mismo cuarto donde estuvo su cuna.	Vive en la misma habitación donde estuvo su cuna.	Vive en la misma habitación donde tiene su moisés.
You know, both selective mutism and an inability to separate from one's mother...	Tanto el mutismo selectivo como la incapacidad de separarse de una madre...	Tanto el mutismo selectivo... ...como la incapacidad para separarse de la madre...	Tanto el mutismo selectivo como la incapacidad de separarse de la madre
...can stem from a pathological fear of women.	...pueden provenir de un miedo patológico a las mujeres.	...pueden provenir de un miedo patológico a las mujeres.	pueden provenir de un miedo patológico a las mujeres.
It might explain why the two of you have created an ersatz homosexual marriage...	Eso explicaría por qué habéis creado una especie de matrimonio homosexual...	Eso podría explicar por qué han creado una réplica de matrimonio homosexual...	Eso podría explicar por qué habéis creado un matrimonio homosexual artificial
...to satisfy your need for intimacy	...para satisfacer la necesidad de intimidad.	...para satisfacer su necesidad de intimidad.	para satisfacer vuestra necesidad de tener relaciones íntimas.
Say what?	¿Qué ha dicho?	¿Qué dijo?	¿Qué dices?
That's basically what I just said.	Eso es lo que yo he preguntado.	Es básicamente lo que dije.	Eso es básicamente lo que he dicho.
You brought your husband to work. You know the rules.	Has traído a tu esposo al trabajo, conoces las reglas	Trajiste a tu marido al trabajo. Conoces las reglas.	Has traído a tu marido al trabajo. Conoces las reglas.
Meesa thinking yousa looking pretty sad now too, betcha, betcha.	Misa piensa tusa mucho triste estás ahora, ¿verdad que sí?	Misa cree que ustedes se ven muy tristes ahora, seguri, seguri.	Misa piensa que tusa también parece bastante triste ahora, a que sí.
Leonard, it's 1:00.	Leonard, es la una en punto.	Leonard, es la 1:00. ¿No ibas a	Leonard, es la una.

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Weren't you going to show me your laboratory at 1:00?	¿No ibas a enseñarme tu laboratorio a la una?	mostrarme tu laboratorio a la 1:00?	¿No me ibas a enseñar tu laboratorio a la una?
There's no hurry, Mother. Tell them more about their secret love for each other.	No hay prisa, madre, háblales más de su secreto amor mutuo.	No hay apuro. Dime más sobre el amor secreto de ellos dos.	No tenemos prisa, Madre. Diles algo más sobre su amor secreto.
But it's 1:00. You were going to show me your laboratory at 1:00.	Pero ya es la una, e ibas a enseñarme tu laboratorio a la una en punto.	Pero es la 1:00. Ibas a mostrarme tu laboratorio a la 1:00.	Pero es la una. Ibas a enseñarme tu laboratorio a la una.
Her reasoning is unassailable. It is 1:00.	Su razonamiento es indiscutible, ya es la una en punto.	Su razonamiento es irrebatible. Es la 1:00.	Su razonamiento es irrefutable. Es la una.
Fine. Let's go.	Vale, vamos.	Bien, vamos.	Vale. Vamos.
I think you'll find my work pretty interesting.	Encontrarás mi trabajo muy interesante.	Creo que encontrarás mi trabajo bastante interesante.	Creo que encontrarás mi trabajo bastante interesante.
I'm attempted to replicate the dark matter signal	Intento replicar los destellos de materia oscura...	Estoy intentando replicar la señal de materia oscura...	Estoy intentando reproducir la señal de la materia oscura
found in sodium iodide crystals by the Italians.	...hallados con los cristales de yoduro de sodio por los italianos.	...que los italianos encontraron en los cristales yodados de sodio.	que los italianos encontraron en cristales de yoduro de sodio.
So, no original research?	¿No haces estudios originales?	¿Así que no es una investigación original?	¿No es una investigación original?
No.	No.		No.
Well, what's the point of my seeing it?	Y, ¿para qué voy a verlo?	¿Para qué voy a verlo entonces?	¿Qué sentido tiene que lo vea?
I could just read the paper the Italians wrote.	Podría leer el trabajo de esos italianos.	Podría sólo leer el artículo que escribieron los italianos.	Simplemente puedo leer el artículo que han escrito los italianos.
Just for the record, we're not in an ersatz homosexual relationship.	Para que conste, no tenemos una especie de matrimonio homosexual.	Para que conste, no estamos en una réplica de relación homosexual.	Solo para que conste, no estamos en una relación homosexual artificial.
Well, then why didn't you say that to her?	Y, ¿por qué no se lo has dicho a ella?	¿Entonces por qué no se lo dijiste a ella?	¿Entonces por qué no se lo has dicho a ella?
Why is it always my responsibility?	- ¿Por qué todo es responsabilidad mía?	¿Por qué es siempre mi responsabilidad?	¿Por qué siempre es mi responsabilidad?
It's not always your responsibility.	- No todo es responsabilidad tuya.	No es siempre tu responsabilidad.	No siempre es tu responsabilidad.
I swear, this is the same thing you did at the comic book store last week.	Esto es lo mismo que hiciste en la tienda de cómics el otro día.	Lo juro, es lo mismo que hiciste en la tienda de historietas la semana pasada.	Lo juro, es lo mismo que me hiciste en la tienda de cómics la semana pasada.
I can't believe you're bringing that up.	Ya estás sacando ese tema otra vez.	No puedo creer que menciones eso.	No me puedo creer que saques a relucir eso.
I didn't bring it up. You did. We'll talk about this later.	- No lo he sacado yo. - Ya hablaremos de eso luego.	- No fui yo. Tú lo hiciste. - Hablaremos de eso después.	No lo saco a relucir. Lo hiciste. Hablaremos de esto luego.
You always say that, but we never do.	Eso dices siempre, pero nunca hablamos.	Siempre dices eso pero nunca lo hacemos.	Siempre dices lo mismo, pero nunca lo hacemos.
You went to the comic book store without me?	¿Fuisteis a la tienda de cómics sin mí?	¿Fueron a la tienda de historietas sin mí?	¿Fuisteis a la tienda de cómics sin mí?

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Appendix 3.   Pre-experiment questionnaire

Pág.1.- ¡Bienvenido a esta encuesta!

Muchas gracias por participar en esta investigación. El estudio sobre la recepción de material audiovisual es parte de la investigación para mi tesis doctoral y se desarrolla dentro del Intercultural Studies Group de la Universitat Rovira i Virgili. Esta encuesta indagará sobre tus conocimientos en idiomas y tus hábitos audiovisuales. En total, te tomará unos 10 minutos aproximadamente. Toda la información recolectada es estrictamente confidencial y no se usará para ningún otro propósito diferente al de la presente investigación. Si tienes alguna duda o comentario, no dudes en contactarme a la dirección de correo davidorregocarmona@gmail.com
De nuevo, gracias por tu participación. David Orrego Carmona

Pág.2.- Datos personales

Gracias por aceptar participar en nuestro estudio. Por favor, responde las siguientes preguntas de la forma más precisa posible.

Preg.1.- Información personal

(* Esta pregunta es obligatoria)

Nombre y apellidos : _____

Ciudad de residencia : _____

Lugar de nacimiento : _____

Grado :   _____

E-mail :   _____

Móvil :   _____

Preg.2.- Sexo

(* Esta pregunta es obligatoria)
(* Marque una sola opción)

☐ Femenino
☐ Masculino

Preg.3.- Edad

_____

Preg.4.- Nivel universitario

(* Esta pregunta es obligatoria)
(* Marque una sola opción)

☐ Primer curso de grado
☐ Segundo curso de grado
☐ Tercer curso de grado
☐ Cuarto curso de grado
☐ Máster

Preg.5.- Idiomas hablados (enuméralos en orden del que más usas al que menos usas):

1. : _____

2. : _____

3. : _____

4. : _____

5. : _____

6. : _____

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Preg.6.- ¿Cuál de los idiomas que acabas de mencionar consideras tu lengua materna? En caso de considerarte bilingüe, escribe los dos idiomas.

1. : _____

2. : _____

Pág.3.- Parte 2: Uso de material audiovisual

Gracias por aceptar participar en nuestro estudio. Por favor, responde las siguientes preguntas de la forma más precisa posible.

Preg.7.- En promedio, ¿cuántas horas a la semana ves material audiovisual (series, películas, documentales, comerciales, vídeos musicales, videojuegos) usando los siguientes medios?
(* Esta pregunta es obligatoria)
(* Marque una sola opción por fila)

	Menos de 1 hora	1-3 horas	4-6 horas	7-9 horas	Más de 10 horas
Televisión	☐	☐	☐	☐	☐
Internet (descargas y en línea)	☐	☐	☐	☐	☐
DVD/Blu-ray	☐	☐	☐	☐	☐
Cine	☐	☐	☐	☐	☐

Preg.8.- Indica la frecuencia con la que has usado los siguientes tipos de traducción en los últimos seis (6) meses al ver material audiovisual producido originalmente en idiomas extranjeros:
(* Esta pregunta es obligatoria)
(* Marque una sola opción por fila)

	Nunca	Alguna vez	A veces	Muy a menudo	Siempre
Voces superpuestas (típico de los documentales y se escuchan la voz original y la traducción)	☐	☐	☐	☐	☐
Doblaje (las voces de los personajes se doblan al idioma del país/región)	☐	☐	☐	☐	☐
Subtitulación (texto insertado en la parte inferior de la pantalla)	☐	☐	☐	☐	☐
Closed caption (texto que aparece en la parte inferior de la pantalla que presenta los diálogos y todos los demás sonidos del vídeo)	☐	☐	☐	☐	☐

Preg.9.- En promedio, ¿cuántas horas al día usas la Internet (correo electrónico, consultas en línea, redes sociales, música, videos, etc.)?
(* Esta pregunta es obligatoria)
(* Marque una sola opción)

☐ Menos de una hora
☐ 1-2 horas
☐ 3-4 horas
☐ 5-6 horas
☐ Más de 7 horas

Appendix 4.   Listening-comprehension test

Encuesta: Cuestionario previo al experimento

Datos personales
--
Gracias por aceptar participar en nuestro estudio.

Preg.1.- Información personal
(* Esta pregunta es obligatoria)

Nombre : _____

Ahora que ya has visto el vídeo, deberás contestar las preguntas que aparecen a continuación. Por favor, responde las siguientes preguntas de la forma más precisa posible.

Test de comprensión
--
Gracias por aceptar participar en nuestro estudio. Por favor, responde las siguientes preguntas de la forma más precisa posible.

Preg.2.- ¿Por qué no usan un ordenador para resolver el problema?
(* Esta pregunta es obligatoria)
(* Marque una sola opción)

☐ El ordenador tardaría mucho tiempo porque hay muchas variables
☐ No tienen todas las variables necesarias
☐ No les ayudaría a resolver el problema
☐ Prefieren solucionarlo ellos mismos
☐ NS/NC

Preg.3.- ¿Por qué Sheldon rechaza la primera propuesta de Raj?
(* Esta pregunta es obligatoria)
(* Marque una sola opción)

☐ La calidad de la imagen
☐ La calidad de los asientos
☐ La calidad del sonido
☐ La disponibilidad de comidas y bebidas
☐ NS/NC

Preg.4.- ¿Cuánto tiempo dicen que les tomará cenar?
(* Esta pregunta es obligatoria)
(* Marque una sola opción)

☐ Media hora
☐ Menos de una hora
☐ Por lo menos una hora
☐ Mucho más de una hora
☐ NS/NC

Preg.5.- ¿Por qué no pueden cenar después de haber ido a cine?
(* Esta pregunta es obligatoria)
(* Marque una sola opción)

☐ Sheldon llegaría tarde al trabajo el día siguiente.
☐ Sheldon no podría cumplir su rutina en la mañana.
☐ Sheldon tiene hambre y los sonidos de su estómago no lo dejarían concentrarse en la película.
☐ Sheldon no podría ir al trabajo en la mañana.
☐ NS/NC

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Preg.6.- Raj propone:
(* Esta pregunta es obligatoria)
(* Marque una sola opción)

☐ Comprar las bebidas y tomarlas en casa antes de marchar.
☐ Tomar las bebidas en el restaurante.
☐ Comprar las bebidas que venden en el cine, aunque sean de otra marca.
☐ Entrar las bebidas a la sala de cine sin que nadie lo note.
☐ NS/NC

Preg.7.- ¿Qué hace Sheldon cuando los demás se van?
(* Esta pregunta es obligatoria)
(* Marque una sola opción)

☐ Sigue analizando el problema.
☐ Encuentra opción posible.
☐ Les da la razón.
☐ Dice que él tiene la razón.
☐ NS/NC

Preg.8.- ¿Cuál es la película que quieren ver?
(* Esta pregunta es obligatoria)
(* Marque una sola opción)

☐ The Time Machine
☐ Red Line
☐ The X-men
☐ No se menciona
☐ NS/NC

¡Muchas gracias por tu participación!

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Appendix 5.   Experiment questionnaire

1. SEK01 ¿Cuál dirías que es tu nivel de inglés?

0	1	2	3	4	5
Nulo	Básico	Inicial	Intermedio	Avanzado	Experto

2. SEK02 ¿Con qué frecuencia te comunicas activamente en inglés (por ejemplo en clase, en conversaciones, por teléfono, por e-mail, en el chat, etc.)?

> a) diariamente
>
> b) varias veces a la semana
>
> c) varias veces al mes
>
> d) varias veces al año
>
> e) casi nunca
>
> f) nunca

3. SEK03 ¿Con qué frecuencia usas el inglés de forma pasiva (por ejemplo al leer libros, ver películas, leer en Internet, etc.)?

> a) diariamente
>
> b) varias veces a la semana
>
> c) varias veces al mes
>
> d) varias veces al año
>
> e) casi nunca
>
> f) nunca

3. On-screen short description of the show, taken from the DVD case.

> Los físicos Leonard y Sheldon son capaces de comprender todo sobre la ineludible fuerza gravitacional de un agujero negro en la compleja estructura del átomo. Pero es coger esos átomos y unirlos conformando una mujer, y su comprensión y facultades chirrían hasta quedar bloqueadas. Es entonces cuando Penny, una mujer que aúna todos esos átomos colocados en todos y cada uno de los sitios más perfectos donde pueden estar, se muda al apartamento de enfrente y hace que, el universo cuántico de Leonard y Sheldon comienza a expandirse hacia límites insospechados que jamás hubieran soñado imaginar.

Question codes: VAQ1.2.5=VAQ (Verbal Attention Question) 1 (clip number) 2 (question number within the category) 5 (question number for clip) Pre-experiment questions: Self-reported English Knowledge

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Clip 1	Segment: TBBT 0204_1_intro	Season: 2	Episode: 4
Code	**General Questions**		
GEQ1.1.1	¿Cómo es tu compresión del vídeo que acabas de ver?	6-point Likert Scale 0=Nula 5=Muy buena	
GEQ1.2.2	¿Ya habías visto este episodio antes?	Open-ended question	
GEQ1.3.3	¿De qué trata el vídeo?	Open-ended question	
	Verbal Attention Questions		
VAQ1.1.4	¿Por qué a Sheldon no le gustan los secadores para las manos de los lavabos?	a) Consumen mucha energía b) El aire que expulsan es demasiado caliente c) No son higiénicos d) No secan bien e) No lo sé	
VAQ1.2.5	¿Cómo se llama la revista que se menciona en la discusión?	Open-ended question	
	Iconic Attention Questions		
IAQ1.1.6	¿Qué están haciendo los personajes cuando llega Raj?	Open-ended question: eating/having lunch	
IAQ1.2.7	¿Qué tipo de comida están comiendo?	a) Comida árabe b) Comida tailandesa c) Comida italiana d) Comida francesa e) No lo sé	
	Narrative Attention Questions		
NAQ1.1.8	¿Cuál es la noticia que tiene Raj?	a) Acaban de regalarle una revista b) Saldrá en una revista c) Escribirá un artículo para una revista d) Trabajará en una revista e) No lo sé	
NAQ1.2.9	¿Cómo reacciona Sheldon ante la noticia de Raj?	Open-ended question: He questions the selection process	
GEQ1.4.10	¿Cómo calificarías el segmento que acabas de ver?	Aburrido 2 3 Muy divertido	
GEQ1.5.11	¿Qué te parece la imagen del vídeo (colores, iluminación)?	6-point Likert Scale 0=Muy desagradable 5=Muy agradable	
GEQ1.6.12	¿Por qué te parece agradable/desagradable?	Open-ended question	
GEQ1.7.13	¿Cómo te resultó seguir la traducción del vídeo?	6-point Likert Scale 0=Muy difícil 5=Muy fácil	
GEQ1.8.14	¿Por qué te parece que la traducción es fácil o difícil?	Open-ended question	
GEQ1.9.15	¿Cómo te parece el diálogo del vídeo?	6-point Likert Scale 0=Muy aburrido 5=Muy divertido	
GEQ1.10.16	¿Por qué te parece que el diálogo es aburrido o divertido?	Open-ended question	

Clip 2	Segment: TBBT_0211_1		Season: 2	Episode: 11
	General Questions			
GEQ2.1.1	¿Cómo es tu compresión del vídeo que acabas de ver?	6-point Likert Scale 0=Nula 5=Muy buena		
GEQ2.2.2	¿Ya habías visto este episodio antes?	Open-ended question		
GEQ2.3.3	¿De qué trata el vídeo?	Open-ended question		
	Verbal Attention Questions			
VAQ2.1.4	¿Qué dice Sheldon sobre Superman al principio del video?	a) Superman no suda en Kriptón b) Superman no suda en la Tierra c) Superman suda en la Tierra d) Superman solo suda en el sol e) No lo sé		
VAQ2.2.5	¿Qué números de contacto le entrega Leonard al científico que acaba de llegar?	Open-ended question: Home number, cell phone number, office number, parent's number in New Jersey		
	Iconic Attention Questions			
IAQ2.1.6	Según la ambientación del vídeo, ¿qué festividad se celebra o qué época del año es?	Open-ended question: Christmas		
IAQ2.2.7	¿Qué están haciendo los personajes?	a) Desayunando b) Comiendo c) Merendando d) Cenando e) No lo sé		
	Narrative Attention Questions			
NAQ2.1.8	Según la discusión inicial de los personajes, se puede decir que	a) Sheldon está de acuerdo con lo que dicen los demás b) Raj y Leonard prefieren a Batman c) Todos se toman en serio el universo de Superman d) Todos son fanáticos de todos los superhéroes e) No lo sé		
NAQ2.2.9	Después de hablar con David (el nuevo científico), ¿cuál es la actitud de Leonard?	Open-ended question: He really wants to work with him.		
GEQ2.4.10	¿Cómo calificarías el segmento que acabas de ver?	Aburrido 2 3 Muy divertido		
GEQ2.5.11	¿Qué te parece la imagen del vídeo (colores, iluminación)?	6-point Likert Scale 0=Muy desagradable 5=Muy agradable		
GEQ2.6.12	¿Por qué te parece agradable/desagradable?	Open-ended question		
GEQ2.7.13	¿Cómo te resultó seguir la traducción del vídeo?	6-point Likert Scale 0=Muy difícil 5=Muy fácil		
GEQ2.8.14	¿Por qué te parece que la traducción es fácil o difícil?	Open-ended question		
GEQ2.9.15	¿Cómo te parece el diálogo del vídeo?	6-point Likert Scale 0=Muy aburrido 5=Muy divertido		
GEQ2.10.16	¿Por qué te parece que el diálogo es aburrido o divertido?	Open-ended question		

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Clip 3	Segment: TBBT_0215_1		Season: 2	Episode: 15
	General Questions			
GEQ3.1.1	¿Cómo es tu compresión del vídeo que acabas de ver?	6-point Likert Scale 0=Nula 5=Muy buena		
GEQ3.2.2	¿Ya habías visto este episodio antes?	Open-ended question		
GEQ3.3.3	¿De qué trata el vídeo?	Open-ended question		
	Verbal Attention Questions			
VAQ3.1.4	¿Cuántos hermanos tiene Leonard según lo que dice su madre?	a) dos hermanas b) dos hermanos varones c) un hermano y una hermana d) tres hermanos e) No lo sé		
VAQ3.2.5	¿Cómo se siente la madre de Leonard respecto a los logros de sus hijos?	Open-ended question: She does not feel proud since these are not her accomplishments.		
	Iconic Attention Questions			
IAQ3.1.6	Según la ambientación del vídeo, ¿en qué lugar se encuentran los personajes?	Open-ended question: University cafeteria		
IAQ3.2.7	En la escena, ¿qué hacen los personajes mientras hablan?	a) Van a empezar a comer b) Están comiendo el postre c) Están tomando el café d) Están comiendo helado e) No lo sé		
	Narrative Attention Questions			
NAQ3.1.8	Durante la discusión, Howard y Leonard imitan la forma de hablar de	a) un personaje de La Guerra de las Galaxias b) un personaje de los X-Men c) un personaje de Star Trek d) un personaje de El Señor de los Anillos e) No lo sé		
NAQ3.2.9	¿Con qué tipo de relación asociarías la discusión final entre Howard y Raj?	Open-ended question: A couple's argument		
GEQ3.4.10	¿Cómo calificarías el segmento que acabas de ver?	Aburrido 2 3 Muy divertido		
GEQ3.5.11	¿Qué te parece la imagen del vídeo (colores, iluminación)?	6-point Likert Scale 0=Muy desagradable 5=Muy agradable		
GEQ3.6.12	¿Por qué te parece agradable/desagradable?	Open-ended question		
GEQ3.7.13	¿Cómo te resultó seguir la traducción del vídeo?	6-point Likert Scale 0=Muy difícil 5=Muy fácil		
GEQ3.8.14	¿Por qué te parece que la traducción es fácil o difícil?	Open-ended question		
GEQ3.9.15	¿Cómo te parece el diálogo del vídeo?	6-point Likert Scale 0=Muy aburrido 5=Muy divertido		
GEQ3.10.16	¿Por qué te parece que el diálogo es aburrido o divertido?	Open-ended question		

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Appendix 6.   Eye-tracking data quality

Participant	Level	Tobii Sample Rate	Clip 1			Clips 2			Clip 3		
			GTS	M.FixSub	M.FixIma	GTS	M.FixSub	M.FixIma	GTS	M.FixSub	M.FixIma
P01	High	93%	94.0	170.11	268.12	94.1	170.44	260.07	93.4	173.82	289.25
P02	Low	94%	93.2	225.23	288.17	96.3	231.08	293.26	97.4	217.36	261.81
P03	High	76%	90.6	121.39	309.83	87.5	155.04	361.09	41.4	195.14	365.97
P04	High	94%	98.8	187.11	532.62	97.6	268.89	523.67	96.3	198.39	484.82
P05	Low	93%	90.3	141.11	177.26	91.6	151.54	185.18	91.5	157.69	188.55
P06	Low	89%	94.0	232.71	276.86	94.2	178.02	216.37	92.5	214.26	253.91
P07	Low	92%	91.6	179.57	374.96	92.0	151.19	324.00	93.2	170.87	324.23
P08	High	95%	97.8	215.25	452.73	98.8	173.99	558.83	98.4	199.41	802.80
P09	Low	91%	97.2	202.64	309.24	96.8	227.10	325.97	96.0	195.57	301.22
P10	Low	88%	91.7	163.31	256.41	95.9	165.04	335.79	94.3	162.51	282.84
P11	High	91%	96.9	178.79	321.02	97.4	140.94	311.06	94.4	191.17	304.86
P12	High	89%	88.1	190.37	572.35	90.1	268.63	582.77	86.2	211.57	661.70
P13	High	94%	97.8	201.14	374.91	98.2	211.33	358.54	98.1	187.75	341.98
P14	Low	97%	98.2	201.50	301.02	99.8	211.01	268.20	99.6	205.51	277.93
P15	High	90%	93.9	156.75	286.30	93.8	178.15	317.28	98.1	172.82	342.73
P16	High	88%	87.8	134.54	336.55	86.2	125.07	259.32	88.8	129.25	316.63
P17	High	87%	80.5	162.95	387.46	91.8	186.61	405.19	89.6	179.10	348.87
P18	High	67%	79.6	215.50	333.11	82.1	145.50	321.88	75.2	169.69	366.88
P19	High	75%	88.7	185.95	333.83	88.9	133.23	328.88	90.5	191.18	400.45
P20	Low	76%	86.5	162.19	282.53	98.0	204.62	301.17	97.9	194.36	303.61
P21	High	93%	99.7	274.75	601.58	99.1	477.33	534.62	98.9	117.00	483.91
P22	Low	80%	78.0	154.94	313.06	91.0	135.80	381.03	84.8	146.80	334.70
P23	Low	79%	89.4	190.58	261.51	87.7	167.91	209.41	89.1	214.50	232.66
P24	Low	95%	96.6	150.00	251.57	98.0	174.01	291.24	98.1	171.44	324.72
P25	Low	89%	98.8	234.90	382.81	96.4	223.75	337.52	95.5	208.20	299.39
P26	Low	81%	91.2	199.87	307.26	94.8	197.94	296.30	94.9	172.82	315.12
P27	Low	88%	97.5	168.46	269.31	98.9	195.13	284.05	98.1	186.04	277.69
P28	Low	95%	99.3	222.11	343.71	99.2	182.25	317.45	99.1	227.80	345.85
P29	Low	88%	94.2	163.15	232.21	94.3	136.24	228.70	94.8	167.49	264.34
P30	High	88%	93.8	228.16	444.77	95.0	243.43	412.73	92.1	207.73	405.31
P31	Low	88%	91.4	186.94	275.35	95.6	227.28	303.54	90.9	217.86	302.21
P32	High	83%	91.9	210.06	494.30	92.2	209.07	488.00	95.2	184.63	504.89
P33	High	91%	97.7	215.58	264.43	98.3	190.96	264.62	99.1	208.54	272.26
P34	Low	94%	97.6	177.56	305.13	98.5	182.34	293.07	97.8	172.66	305.54
P35	Low	95%	97.3	203.20	354.95	98.1	204.87	311.75	98.4	186.47	320.52
P36	Low	93%	97.7	168.23	323.92	98.5	197.98	324.57	88.1	190.48	322.32

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P37	High	92%	96.2	153.89	347.40	95.5	130.31	312.26	95.0	175.45	367.51
P38	Low	90%	97.2	177.80	307.36	98.3	146.08	288.78	96.1	157.56	312.12
P39	High	94%	94.2	199.67	383.84	96.3	227.21	418.46	97.2	205.56	397.04
P40	High	97%	97.6	215.28	393.15	98.2	234.72	353.91	97.6	215.38	307.04
P41	High	88%	90.1	182.51	307.11	93.0	178.60	282.81	90.9	182.16	315.81
P42	Low	86%	93.6	212.91	353.27	92.5	181.63	262.64	90.4	196.84	305.57
P43	High	96%	98.9	214.46	451.10	98.5	163.52	365.62	98.1	191.41	360.36
P44	High	77%	85.5	165.60	336.03	86.2	184.60	359.78	89.3	179.44	339.00
P45	High	88%	93.1	184.33	373.06	94.1	136.16	337.61	94.8	176.23	366.00
P46	High	96%	97.0	207.52	572.64	98.0	196.55	606.29	98.1	184.80	528.74
P47	High	95%	96.2	173.87	305.89	96.5	190.45	338.16	95.5	188.30	341.98
P48	High	93%	96.6	220.61	374.88	96.4	196.82	386.12	97.0	220.28	407.13
P49	Low	91%	97.0	144.81	312.26	90.4	161.96	317.86	90.7	167.01	309.42
P50	Low	96%	96.3	185.12	382.62	98.1	194.52	383.32	98.3	176.99	380.57
P51	Low	89%	97.4	175.61	252.82	96.7	141.00	219.16	96.8	178.99	252.14
P52	Low	96%	99.1	164.09	357.99	99.1	184.07	348.06	98.8	192.49	357.28