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Watch me!

Comprehensibility of, and customer attitude
towards Same Language Subtitling in
instruction videos

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Abstract

Videosharing websites such as Youtube have created a new dimension in online marketing and content creation. Companies can now easily share their instruction videos. However, since a lot of companies operate multinationally and therefore have customer groups with different native languages, they have to find ways to make the instruction videos available and comprehensible to all of those consumers. Dubbing is a widely used, yet costly solution for companies. Subtitling is less costly, but still time-consuming when companies have to translate their instruction video into different languages. Since earlier learning and television studies found positive effects on Same Language Subtitling (SLS), this study further investigates whether SLS could be a possible solution for companies to make their instruction videos comprehensible without receiving a negative attitude from different customer groups, by conducting a Lego building task among Dutch participants. Because some foreign languages are better understood than others, a distinction between languages the audiences were used to (English) and less used to (French) was made. During the experiment, participants watched an instruction video about how to build a Lego house and were expected to actually build the house themselves with the Lego bricks provided by the researcher. The instruction video the participants got to watch could be English or French spoken, and with or without SLS. Before and after the instruction video, the participants filled in a short questionnaire. Although the outcomes of this study should be interpreted with caution due to a small sample size, the results of the experiment show that SLS did not have any influence on the comprehensibility or attitude of the audience. Language, however, did: those participants who watched the instruction video in English made significantly fewer mistakes than those who watched the video in French.

Introduction

Video marketing

The emergence of videosharing websites such as Youtube has led to a new dimension in online marketing and content creation. Thanks to Youtube, companies can easily share instruction videos on their websites and social media channels. Video marketing gives companies the opportunity to develop instruction videos in order to explain the use of their products or services, while at the same time create brand awareness, improve the customer service experience, satisfy customer needs, and improve customer engagement as a part of their marketing strategy. Nowadays, instruction videos are broadly shared by companies and, since many companies operate in multiple countries, reach a heterogeneous and global customer group. However, the use of instruction videos also brings difficulties that companies have to deal with. When companies want to address different customer groups living in different countries and speak different languages, an important question is how to make the instruction videos available and comprehensible to all of those customers, regardless of national or regional differences such as linguistic backgrounds.

One possible solution would be to translate the videos for each country. But due to cost–benefit and profit-making considerations, companies are always searching for new ways to reach large groups of customers all over the world with as little time and cost as possible. Creating online video content still remains a costly matter, especially when the instruction videos have to be translated. Therefore the challenge is to make instruction videos that are understandable for every customer, but at the same time keep down the costs. Of course, companies could also choose not to translate their videos. A lot of instruction videos on the World Wide Web are in English. Since English is seen as a lingua franca these days and many people do have a certain basic knowledge of the English language (Koolstra, Peeters and Spinhof, 2002), providing the instruction videos in English without any translation seems to be a viable option. However, many companies do not have an English-speaking market as their main market. They might, for example, have a predominantly Spanish market, which is why they might opt to create their videos in Spanish rather than English. Therefore, a translation of the video materials would probably be required for the non-Spanish speaking countries that import their products.

Given the relatively high costs involved in producing translations of video material, companies might want to seek out more cost-reducing options when trying to make their instruction videos available for every consumer. Even when they do not have the same native tongue as the language spoken in the original video. This explorative study investigates one of these alternative options, namely ‘same-language subtitling’ (SLS). The following sections will first sketch an overview on the topic of online instruction videos in general. Various language adaptation methods will be discussed. Subsequently more detailed information on SLS will be provided, before concluding with the research questions of the current study.

Online instruction videos versus other type of instructions

Before the introduction of online instruction videos, paper instructions and instructions on DVD did exist. However, these were not used as a marketing communication material with profit-making potential. Contrary to paper instructions or instructions on DVD, online instruction videos are easy to share online, are easy to save without taking up space and mostly take little time to watch. Instead of rummaging through an old shoe box full of paper instructions, these days the instructions (either a text or a video) can be easily found online and, if desired, they can be saved on the computer.

In addition to this ease of accessibility, online instruction videos can be a better source to share information than paper instructions. Paper instructions give readers the opportunity to "scan" the pages and look for the information that seems most relevant for them. However, this can cause of mistakes, since readers might miss out on important information. This is one of the great pitfalls of assembling Ikea furniture. Online instruction videos can be fast-forwarded, but since it is difficult to scan the information. The customer is thus more likely to watch the video as a whole, which might induce a more efficient information transfer.

Also, the use of instruction videos improves usability because it is easier to follow instructions when they are demonstrated realistically, especially when they concern detailed and complex actions. This is because they make use of both audio and visual instructions (Salomon, 1984). While watching instruction videos, customers also have the opportunity to multitask, for example to listen to the instructions and assemble an object at the same time. Instruction videos probably also require less memory effort because listening and watching is perceived “easier” than reading and trying to visualize, for example because is more realistic (Salomon, 1984).

Finally, instruction videos provide the opportunity to communicate a lot of information in a short period of time. Therefore, instruction videos have become an important element of the marketing communication of companies, rather than paper instructions or DVD instructions. Given these advantages, online video instructions can be considered very successful when they are broadly watched and shared on the internet. At the same time, however, language adaptation issues have emerged since companies have to serve a wide range of customers with different language backgrounds. The following section will give an overview of the various adaptation methods that have been used.

Adaptation methods and their (dis)advantages

In general, subtitling and dubbing are the two most commonly used adaptation methods to translate exported movies and television programs (Koolstra, Peeters, & Spinhof, 2002). In the Netherlands, subtitling in Dutch is commonly used as an adaptation method for movies and television programs in a foreign language. Subtitles are usually found on the lower part of the screen and their use can be defined as a way of translating that presents a written text which attempts to cover the original dialogue of the speakers (Díaz Cintas & Remael, 2007). Discursive elements such as “letters, inserts, graffiti, inscriptions, placards, (...) songs, and voices off” can be part of subtitles as well (Díaz Cintas & Remael, 2007, p.8).

When talking about subtitling, the term is mostly used in cases where the audio is available in a language the audience cannot understand and the text on the screen is in the native tongue of the audience. But subtitling in the same language as the spoken audio is possible as well. This is also known as same language subtitling (SLS). Mostly, SLS is used for the deaf or hard of hearing (in this case it also includes descriptions of sound effects and is often referred to as ‘closed captioning’) or as a method to increase literacy. This is widely done in Bollywood movies (Kotharie, Pandey, and Chudgar, 2004).

An alternative adaptation method is dubbing. In countries like Germany, France, and Spain, dubbing is commonly used to translate foreign movies. Dubbing is an adaptation method where the original soundtrack of the video – including all spoken dialogues – has been replaced by another soundtrack with similar dialogues in the native language of the audience (Díaz Cintas & Remael, 2007). Given the divergent nature of these adaptation methods, various advantages and disadvantages can be pointed out. These will be discussed in the following section.

Advantages and disadvantages of the most common adaptation methods

Research of Koolstra, Peeters and Spinhof (2002) about movies and television programs shows that both adaptation methods, subtitling and dubbing, each have their advantages and disadvantages. Of these advantages and disadvantages the following apply to instruction videos. First of all, dubbing and subtitling require a different way of information processing. For dubbed materials, the audience is required to listen in order to receive information, whereas for subtitled materials they have to read to be able to follow the program. So in the case of subtitling, the audience needs a certain ability and reading speed. Second, in contrast to dubbed materials, the audience is hindered from performing other tasks at the same time. Such as assembling parts of a piece of furniture or, in the case of Microsoft's 'Virtual Academy', switching to another window while leaving the video on. Because they have to focus on the screen to read the subtitles. Furthermore, there is a certain amount of viewer distraction, as subtitles take the attention away from the screen (Koolstra, Peeters & Spinhof, 2002) which makes it harder to follow the visual instructions demonstrated on the screen.

In addition, the use of subtitles causes a decrease in screen capacity and could therefore cover the visual instructions on the screen. On the other hand, dubbed television materials are less easier to follow than subtitled programs where there is a noisy environment (Koolstra, Peeters & Spinhof, 2002, p. 332), for instance if the instructions require the use of noisy tools.

Dubbing is much more expensive than subtitling, since it requires more time and has more technical adaptation difficulties. According to Díaz Cintas and Anderman (2009) dubbing is five to ten times more expensive than subtitling. This would make subtitled instruction videos significantly cheaper.

This is especially true in case that the company chooses a SLS instruction video, because then they do not have to hire translators to translate their subtitles into a different language. Also the audience could experience dubbed television material as unnatural and distracting, especially when they are not used to dubbing, since perfect lip-synchronization is hardly possible (Koolstra, Peeters & Spinhof, 2002). This could decrease customer satisfaction. Both in the case of dubbing and subtitling, loss of information takes place, for example when translated sentences get too long, or when a pun is difficult to translate. While for subtitled programs the audience is able to hear and see the redundancy, in the case of dubbing the audience "does not dispose of redundant information" (Koolstra, Peeters & Spinhof, 2002). According to d'Ydewalle, Praet, Verfaillie and Van Rensbergen (1991), subtitling is more efficient in terms of information processing, since "reading is usually faster than listening".

(Possible) effects of SLS

Taking into account the existing body of research, it can be concluded that both adaptation methods, subtitling and dubbing, each have their benefits and drawbacks. Yet, most existing research on dubbing and subtitling, note that this does not include SLS, found no significant difference in effectiveness between these both language adaptation methods in case of movies and television programs (e.g. Wissmath, Weibel & Groner, 2009; d'Ydewalle et al., 1987; Mangnus, Hoeken, & van Driel, 1994; Poolman, 2011).

Existing research on SLS predominantly concentrates on learning, foreign language acquisition and the effects on illiteracy, but never specifically on comprehension. A study by Mitterer and McQueen (2009) aimed to investigate the comprehension of foreign speech and whether subtitling in the native and foreign language contributed to this understanding or not. In their experiment they used Australian and Scottish regional accents, with which the Dutch participants were unfamiliar. They have posited that the difficulty of understanding foreign speech is partly due to the fact that the audience is not used to the mappings between the words used and the sounds used to pronounce the words. In their study, native-language subtitles in combination with foreign-language audio hindered the comprehension of foreign accents (Australian and Scottish) while SLS was beneficial.

Neuman and Koskinen (1992) conducted an experiment on bilingual seventh and eighth graders to investigate the effect of SLS on television and foreign language learning (English, in this case). From their research they concluded that longer-term use of SLS had a positive effect on word knowledge and recall of information, making this method more beneficial than reading while listening or traditional television watching without translation. Also, the higher the level of English proficiency of the student, the more words were learned from the context. So a certain basic knowledge of the language was needed in order to benefit from SLS.

This is further confirmed by research by Taylor (2005), who conducted an experiment on the effects of captioning with beginning and intermediate Spanish students. In his research, Taylor found that beginning learners get confused or distracted by SLS. Thus under certain circumstances SLS might have a negative effect.

Research among Japanese EFL students however found that SLS (in English) had a positive effect on the listening comprehension of low, intermediate, and high levels of English (Hirose & Kamei, 1993). Especially in the case of easy materials, using SLS significantly improved recall. Besides the researches

just mentioned, a lot of other researches also confirm the positive effect of SLS in movies and television programs on learning (e.g. Bird and Williams (2002), Vanderplank (1988), Krashen (1982)). Research by Kotharie, Pandey, and Chudgar (2004) and Kothari and Bandyopadhyay (2008) shows that SLS has a huge potential in reducing illiteracy. They conclude that SLS has the potential of reinforcing the reading skills of children as well as adults when adding SLS to television programs or film songs.

Of course, it should be noted that the preferred adaptation method also depends on the adaptation method the audience is used to (Kilborn, 1993). When generally used to dubbing, the audience has to get used to watching movies with subtitling, and the other way around. When it comes to preference, the choice of adaptation method (dubbing/subtitling) is therefore usually more of an emotive issue rather than primarily a pragmatic one. Moreover, most research is done on movies and television programs. It is not clear if the same outcomes will be found for SLS and instructional videos as well, since instruction videos are a different genre and SLS is different from regular subtitling. Movies as well as most television programs contain a certain level of entertainment, but instruction videos are primarily informative. Also, instruction videos require active participation because the audience has to gain knowledge about a subject or assemble an object themselves after watching. This might cause a difference in how the audience comprehends the content and the way they receive the audiovisual aspects of instruction videos.

Effect of adaptation on information processing

As mentioned above, instruction videos can be seen as a beneficial resource with regards to efficient information transfer when compared to written instructions. However when looking at the processing of all the information, there might be a negative interference when the videos are translated. According to Miller (1956), only a few elements can be processed at the same time without causing an overload in working memory. The question in the case of SLS instruction videos is whether the combination of the various element cause an overload of the working memory or not.

According to Bisson, Van Heuven, Conklin, and Tunney (2014) in case of normal (i.e., different-language subtitling) the viewer has three sources of information to process (the subtitles, the audio, and the dynamic images) and has to deal with the multilingual situation of the audio and the subtitles differing from each other. This can make reading of the subtitles less powerful. In the case of SLS instruction videos, there is no multilingual situation involved, thereby reducing the number of information elements. In case of instruction videos, however the viewer also has to assemble or fix an object while watching, reading and listening which requires a high level of multitasking skills.

Kalyuga, Chandler, and Sweller (1999, p. 352) assume that a viewer has "a limited working memory capacity" and "any increase in cognitive resources required to process split-attention materials decreases resources". This means that if a viewer has to process too many elements of information, it may overload the viewer's working memory, and therefore cause a decrease in the effectiveness of processing (Miller, 1956). However, they also state that when textual information is presented in auditory form it may not overburden the working memory capacity.

A study about effective computer-based instructions investigated different ways of instructing how a bicycle pump works by audio-only explanation, visual animation only, both audio and visual explanation at the same time, and no explanation at all (Mayer & Anderson 1992). Their research showed that the group that received both audio and visual instructions simultaneously had the best results.

On the other hand, Kalyuga, Chandler, and Sweller (1999, p. 362) state that "having auditory textual explanations duplicated in a visual form significantly inhibited learning due to an increase in cognitive load". Therefore it is still unclear what kind of effect the subtitling of instruction videos may cause. In order to decrease memory working capacity, companies could choose to present audio and (same language) subtitling information at the same time. In the case of English instruction videos the customers are expected to mostly have some English skills, so it may be helpful if the same information is provided in English for audio as well as subtitles (Neuman & Koskinen, 1992).

Mitterer and McQueen (2009) concluded from their television study experiment that English spoken videos with English subtitles were better received than English spoken videos with Dutch subtitles. And subtitling in general was better than no subtitling at all. However, the question is how this would work out for companies that operate in non-English countries and which have to create their videos in a language the audience is less able to understand. Would SLS still be beneficial to listening comprehension? This is possible, since viewers can see the visual animated instructions on the screen. They might recognize words that are basically the same as in their L1, but which sound different due to pronunciation. In the study of Mitterer and McQueen, 2009, they stress the benefits of SLS, since the audience might have the lexical knowledge, but lack in understanding the spoken audio since they are not used to the mappings between word and sound. In both cases, L2 videos with or without SLS, the written words are "not affected by intonation, accents, or background noise; thus, having access to both the soundtrack and subtitles allows for easier word segmentation by indicating which words are being spoken" (Bisson, Van Heuven, Conklin & Tunney, 2014, p. 401). However, no specific research is done about same language subtitling (SLS) in this type of instruction videos and therefore in this literature overview assumptions in

regard to SLS and instruction videos are made that need to be investigated. Therefore, the following research questions were formulated:

RQ1: Is there a difference in participants' abilities to understand an instruction video when language and translation choice differ from their mother tongue?

RQ1a: Will instruction videos in a foreign language the audience is used to (English) be better understood than instruction videos in a foreign language the audience barely is used to (French)?

RQ1b: Will SLS instruction videos in a foreign language the audience is used to (English) be better understood than SLS instruction videos in a foreign language the audience barely is used to (French)?

RQ1c: Will SLS instruction videos in a foreign language the audience barely is used to (French) be better understood than the same instruction videos without subtitles?

RQ1d: Will SLS instruction videos in a foreign language the audience is used to (English) be better understood than the same instruction videos without subtitles?

RQ2: Is there a difference in participants' attitudes about the instruction video and the corresponding task among the different versions?

Method

Research design

In this quantitative study, a between subject design was used in which 69 Dutch participants performed a Lego building task while watching an instruction video. There were four versions of the instruction video which were identical, except for the language spoken in the video. In total, 17 participants watched the English spoken version of the instruction video, and another 17 participants watched the French spoken version of the instruction video. The remaining two versions contained subtitling: 18 participants watched the English spoken and English subtitled version of the instruction video and 17 participants watched the French spoken and French subtitled version of the instruction video. Because the Levene's test was violated in some cases, one participant was deleted randomly from the English spoken and English subtitled version of the instruction video to make the n's equal so the outcomes could still be used.

Materials

In order to compare French and English with and without subtitles, an instruction video of 'how to build a simple Lego house' was created. The Lego house consisted of 39 Lego bricks in total. Each layer from the eight layers contained one color, and two types of bricks were used: a square brick (with four knobs), and a rectangular brick (with eight knobs). The instructions were given visually by an instructor showing how to build the Lego house, and via audio by a voice over.

The first layer of the house was shown as a whole on the video. The instructions how to build the first layer for the color and type of the brick were given by audio only. The second layer of the house did not contain any specific audio instructions about the type of bricks used. The participants had to build the third layer of the house by the visual instructions only for the type of bricks. For the fourth layer in the back, two square bricks had to be placed in the middle.

However, the participants were not able to see this on the video since the instructor's hand was blocking the view. These two type of bricks could also only be built by understanding the audio instructions. For the last layer of the house, the chimney, a red brick was used in the video. However, the audio instructions explained that a red brick was used because the instructor did not have any other colors left, but that the participant had to use a green brick instead of a red brick. So for the last layer of the house, the color of the brick could have only been chosen right by understanding the audio. The other layers provided information about the colors and the type of bricks by both audio and visual instructions.

The instruction video was originally made in Dutch, and for the experiment the spoken instructions were translated in English and French by academics and checked by native speakers of the language. After

translating, the spoken instructions were also back-translated, to check the accuracy of the original translation. In a studio, the voice over audio instructions were recorded in French and English by native speakers. Then, four types of the instruction video were made. Two with a French voice over, one one subtitled and the other not, and two with an English voice over, again one subtitled and the other not. The subtitling was identical to the voice over and not shortened, since the audio instructions were rather short and simple.

Figure 1: A film still of the English version of the instruction movie, with subtitles



Figure 2: A film still of the French version of the instruction movie, with subtitles



Subjects

The Dutch participants were randomly divided into four separate groups, consisting of 17 participants each (18 in the English spoken and English subtitled version of the instruction video group, before deleting one). The participants were aged between 17 and 63, the majority of the participants were in their twenties (82.3%). In total, 73.3% of the participants were female while 26.7 % were male ($M=1.62$, $SD=.49$). All Dutch educational levels were represented among the participants, but the majority of the participants had a "WO" (university) level (82.4%). In total, 16,2% of the participants was raised up in a multilingual environment. The participants were asked to self-asses their language proficiency in English or French, dependent on which instruction video they would watch. Language proficiency consisted of four items (reading/speech/listening/writing). The Cronbach's alpha for these items was almost perfect ($\alpha = .96$). The participants differed significantly in their language proficiency ($t(66)=3.09$, $p < .001$), as the participants rated themselves less proficient in French than the other participants did for English ($M=-1.52$, $SD=.18$).

Regarding the use of instruction videos in general, 76.5% of the participants makes or has made use of instruction videos ($M=-1.24$, $SD=.427$), mostly a few times a year (42.3%) till monthly (32.7), and even weekly (21.2%, $M=3.29$, $SD=.118$). All participants who watched the instruction videos used the internet as a medium, but besides that some participants also made use of instruction videos on TV (5.8%) or DVD (1.9%). The instruction videos were mostly watched in English (96.2% of the cases), as well as in Dutch (80.8%). Remarkably, 5.8% of the participants also watched instruction videos in French. Other languages listened to were German (19.2%), Chinese and Arabic (both 1.9%).

Instruments

In this present study, understanding of the instruction video and the participants' attitude about the instruction video were measured.

Comprehension of the instruction video was measured by looking at the participant's ability to build the Lego house correctly, as explained in the instruction video. This was measured by calculating how much of the Lego house was build right by the participants in percentages. Correctness of the right type of bricks in total and right color of the layers in total were calculated. Next to that, correctness for the audio, visual, and audiovisual instructions were distinguished and measured as well.

The participants' attitude about instruction videos in a non-native language, with and without subtitling, was measured by an online questionnaire that measured enjoyment, satisfaction and difficulty on a Likert scale. Each version group answered an almost identical questionnaire, except for variations depending on the specific version (e.g. "How do you rate your English proficiency" versus "How do you rate your

French proficiency"). Enjoyment was measured by one item, namely "How much did you enjoy this task?". Satisfaction was measured by one item as well, namely "How satisfied do you feel about this task?". Difficulty was measured by several items, namely: difficulty of picking the right color, difficulty of picking the right type of brick, difficulty of choosing the right place, difficulty of understanding the visual instructions, difficulty of understanding the audio instructions, and difficulty of multitasking. The difficulty of reading the subtitles was treated as a separate item, since not all versions of the questionnaire contained this question. The reliability of difficulty was adequate ($\alpha = .74$). The full questionnaire can be found in Appendix X.

Procedure

The participants from this study were recruited from public buildings such as libraries and the Radboud University Nijmegen. Participants were also recruited from amongst the acquaintances of the researcher. Participants were asked to fill in the first half of the questionnaire on a laptop, which contained questions about their background and French or English sufficiency. Then they were asked to put on the headphones, watch the instruction video and build the Lego house at the same time. The Lego bricks were sorted out in groups based on color beforehand by the researcher and arranged on the table arbitrary. After building the Lego house, the researcher inquired about the participants first reaction about the task and made a short note if something worth mentioning came up; e.g. the participant heard something about a green brick, but was not able to understand the instructions well enough to build the chimney correctly. Then, participants were asked to fill in the second half of the questionnaire, which contained questions about enjoyment, satisfaction, difficulty, use of the different type of instructions (visual, audio, and in some occasions subtitling), and the use of instruction videos by the participants in general (frequency, the source of the instruction videos, the language of the instruction videos, and if they contained subtitling). During the experiment, free chocolate cookies were available as a token of appreciation.

Statistical treatment

Several ANOVA tests and regression tests were run using the statistics software SPSS21 to indicate significant main and interaction effects of the dependent and independent variables. Levene's test was violated in some cases, however, since the n's were equal this did not influence the outcomes.

Results

The main purpose of this study was to investigate comprehension of, and attitude towards, instruction videos in French and English with and without subtitles. Comprehension was measured by how much of the Lego house was built correctly (in percentages). Concerning attitude, task difficulty, task enjoyment and task satisfaction were measured.

Correctness and version

An ANOVA with as factors Correct_Type_Brick_Total (in percentages) and Version (French, French with subtitling, English, and English with subtitling) showed that there was a significant main effect of Version ($F(3,64) = 7.35, p < .001$) on the participants' ability to build the Lego house with the right type of Lego bricks correctly as explained in the instruction video. Results according to a post-hoc test showed that the English spoken instruction video without subtitles ($M = 95.47, SD = 6.76$) evoked significantly ($p = .021$) less mistakes in building the Lego house correctly than the French version without subtitling ($M = 81.59, SD = 15.15$). The English version with subtitling is positioned between these two groups, namely they evoke the correct building of the Lego house, but not significantly more or less than the English ($p = .974$) and French version without subtitling ($p = .061$). On its turn, the English spoken instruction video with subtitling ($M = 84.92, SD = 8.77$) evoked significantly ($p = .005$) less mistakes in building the Lego house correctly than the French version with subtitling ($M = 81.59, SD = 15.15$).

Table 1. The participants' ability to build the Lego house correctly with the right type of Lego bricks as explained in the French and English instruction videos with and without subtitling (0 = all wrong, 100 = all correct)

Version (n=17)	<i>M</i>	<i>SD</i>
French + subtitling	81.59	15.15
French	84.92	8.77
English + subtitling	93.97	8.55
English	95.47	6.76
Total	88.99	11.69

An ANOVA with as factors Correct_Color_Brick_Total (in percentages) and Version (French, French with subtitling, English, and English with subtitling) showed that there was a significant main effect of all Versions ($F(3,64) = 2.83, p = .045$) on the participants' ability to build the Lego house with the right colors of Lego bricks correctly as explained in the instruction video. However, results according to a post-hoc test show no significant differences between the four versions.

Table 2. The participants' ability to build the Lego house correctly with the right color of Lego bricks as explained in the French and English instruction videos with and without subtitling (0 = all wrong, 100 = all correct)

Version (n=17)	<i>M</i>	<i>SD</i>
French + subtitling	88.97	17.61
French	88.24	14.30
English + subtitling	97.06	5.47
English	97.06	5.47
Total	92.83	12.47

For an ANOVA with as factors Correct_Type_Audiovisual (in percentages) and Version (French, French with subtitling, English, and English with subtitling), the Levene's Test was violated ($p = .006$). However, since the n's were equal this did not influence the outcomes. The results showed that there was no significant main effect of Version ($F(3,64) = 1000, p = .399$) on the participants' ability to build the Lego house with the right type of Lego bricks correctly as explained by the audiovisual instructions in the video.

Table 3. The participants' ability to build the Lego house correctly with the right type of Lego bricks as explained with audio and visual instructions in the French and English instruction videos with and without subtitling (0 = all wrong, 100 = all correct)

Version (n=17)	<i>M</i>	<i>SD</i>
French + subtitling	95.72	17.64

French	100	.00
English + subtitling	100	.00
English	100	.00
Total	98.93	8.82

An ANOVA with as factors Correct_Type_Audio (in percentages) and Version (French, French with subtitling, English, and English with subtitling) showed that there was a significant main effect of Version ($F(3,64) = 10.80, p < .001$) on the participants' ability to build the Lego house with the right type of Lego bricks correctly as explained in the layers consisting audio only instructions in the video. Results according to a post-hoc test showed that both the English spoken instruction video with ($M = 80.21, SD = 29.67$) and without subtitles ($M = 82.35, SD = 25.61$) evoked significantly (respectively $p = .001$ and $p = .002$) less mistakes in building the Lego house correctly than the French version with ($M = 43.85, SD = 21.62$) and without subtitling ($M = 42.25, SD = 32.77$). No significant differences were found between the two different language variables ($p = .998$ for French with and without subtitles, and $p = .996$ for English with and without subtitles).

Table 4. The participants' ability to build the Lego house correctly with the right type of Lego bricks as explained with audio instructions in the French and English instruction videos with and without subtitling (0 = all wrong, 100 = all correct)

Version (n=17)	<i>M</i>	<i>SD</i>
French + subtitling	43.85	21.62
French	42.25	32.77
English + subtitling	80.21	29.67
English	82.35	25.61
Total	62.17	33.27

An ANOVA with as factors Correct_Type_Visual (in percentages) and Version (French, French with subtitling, English, and English with subtitling) showed that there was no significant main effect of

Version ($F(3,64) = 1000, p=.399$) on the participants' ability to build the Lego house with the right type of Lego bricks correctly as explained in the layers consisting visual instructions only in the video.

Table 5. The participants' ability to build the Lego house correctly with the right type of Lego bricks as explained with visual instructions in the French and English instruction videos with and without subtitling (0 = all wrong, 100 = all correct)

Version (n=17)	<i>M</i>	<i>SD</i>
French + subtitling	96.08	16.18
French	100	.00
English + subtitling	100	.00
English	100	.00
Total	99.02	8.09

Correctness and language proficiency

A linear regression analysis of Correct_Type_Brick_Total (in percentages) showed that the variables entered in the model explained 13.2% of the variance in the participants' ability to build the Lego house with the right type of Lego bricks correctly as explained in the instruction video ($F(2,65) = 10.39, p < .001$). Version was shown to be a significant predictor ($\beta = .425, p = .008$), however, language proficiency was not ($p=.574$).

A linear regression analysis of Correct_Colour_Brick_Total (in percentages) showed that the variables entered in the model explained 10.3% of the variance in the participants' ability to build the Lego house with the right colour Lego bricks correctly as explained in the instruction video ($F(2,65) = 3.73, p = .029$). However, version and language proficiency were not shown to be significant predictors respectively, $p = .296$ and $p = .326$).

A linear regression analysis of Correct_Type_Audio (in percentages) showed that the variables entered in the model explained 31.3% of the variance in the participants' ability to build the Lego house with the right type of Lego bricks correctly as explained with the audio instructions in the video ($F(2,65) = 14.82, p < .001$). Version ($\beta = .304, p = .044$) and language proficiency ($\beta = .299, p = .047$) were both shown to be a significant predictor.

For the audiovisual and visual instructions, a linear regression analysis showed that the version and language proficiency were no significant predictors.

Correctness and difficulty

A linear regression analysis of the correctness of building and the difficulty of the task rated by the participants of the version with subtitling (English and French) showed that difficulty (difficulty of reading the subtitles included) was no significant predictor for the type of Lego bricks, the color of the Lego bricks, the audiovisual instructions, the audio instructions, and the visual instructions.

A linear regression analysis of the correctness of building and the difficulty of the task rated by the participants of the version without subtitling (English and French) also showed that difficulty was no significant predictor for the type of Lego bricks, the color of the Lego bricks, and the audio instructions. The variables of the linear regression analyses can be found in Appendix E, table E.1 and E.2.

Correctness and reading speed

A linear regression analysis about the self-estimated reading speed of the participants that watched the versions with subtitling showed that the self-estimated reading speed was no significant predictor for the correctness of building (for type of Lego bricks, the color of the Lego bricks, the audiovisual instructions, the audio instructions, and the visual instructions). The variables of the linear regression analysis can be found in Appendix E, table E.3.

Enjoyment and Satisfaction

An ANOVA with as factors Task_Enjoyment (on a five point scale) and Version, showed no significant main effects of the version on the self-rated enjoyment of the task by the participants ($p=.37$). The same counts for an ANOVA on Task_Satisfaction (on a five point scale) and Version ($p=.56$). The variables of the two ANOVA test can be found in Appendix E (table E.4 for the effect of version on enjoyment and table E.5 for the effect of version on satisfaction).

Conclusion and discussion

The aim of this study was to investigate the effect of foreign instruction videos with same language subtitling. Because some foreign languages, such as English, are probably better understood in the Netherlands than other foreign languages, such as for example French, the effect of an instruction video in English (easier to understand or probably more used to in everyday life) and the effect of an instruction video in French (more difficult to understand or probably less used to in everyday life) were investigated. Both languages had a version with and a version without SLS, to measure the added value of SLS compared to listening to the audio instructions. First, the research questions will be answered and discussed. Then, a more overall conclusion and discussion about this study will be given.

RQ1: Is there a difference in participants' abilities to understand an instruction video when language and translation choice differ from their mother tongue?

RQ1a: Will instruction videos in a foreign language the audience is used to (English) be better understood than instruction videos in a foreign language the audience barely is used to (French)?

The results of this experiment show that participants made significantly less mistakes building the Lego house when the information was provided in English than when they watched the same instruction video in French. This difference was found for the audio-only parts of the task, and not for choosing the right color and other audiovisual and visual information. This seems logical, since the information that could be retrieved visually did not differ among the different versions. The information that only could be retrieved by the audio instructions was perceived significantly different between the English and French version. So when there was a lack of visual support language choice did matter and English was indeed better understood than French.

RQ1b: Will SLS instruction videos in a foreign language the audience is used to (English) be better understood than SLS instruction videos in a foreign language the audience barely is used to (French)?

SLS in English instruction did not render better comprehension of the instructions than SLS in French videos. The results of this experiment show that participants in the English with English subtitles group made significantly fewer mistakes building the Lego house than the French with French subtitles group. The reason why participants from the English with English subtitles group made less mistakes than the French with French subtitles group was that the participants from the first group gained better understanding from the audio parts than the French with French subtitles group. Adding SLS did not render better comprehension, since there was no significant difference between the

English with English subtitles group and the English without subtitles group. The same holds true for the French with French subtitles group and the French without subtitles group.

RQ1c: Will SLS instruction videos in a foreign language the audience barely is used to (French) be better understood than the same instruction videos without subtitles?

The participants who watched the French SLS instruction video during the experiment did not significantly make more or fewer mistakes building the Lego house compared to the participants who watched the French instruction video without subtitles. This means that in this experiment, adding SLS to the instruction video did not have any (positive or negative) effect on the comprehension of the participants.

RQ1d: Will SLS instruction videos in a foreign language the audience is used to (English) be better understood than the same instruction videos without subtitles?

The participants who watched the English SLS instruction video during the experiment did not significantly make more or less mistakes building the Lego house compared to the participants who watched the English instruction video without subtitles. Analogously to the results found for RQ1c, adding SLS to the instruction video did not have any effect on the performance of the participants.

To sum up the overall findings for the first research question, language choice does make a great difference in participants' ability to understand an instruction video. It was shown that it is important to make a difference between familiar and unfamiliar languages, since performance significantly differed in the different language conditions. In this study, language proficiency was only a significant predictor for the audio only instructions given in the video. However, difficulty of the task and the reading speed did not significantly influence the outcomes.

RQ2: Is there a difference in participants' attitude about the instruction video and the corresponding task among the different versions?

The outcomes of the questionnaire showed that the participants did not rate their enjoyment differently among the different versions of the instruction video. Overall, their attitude was quite positive towards the instruction video and the task. Probably the focus of the participants was more on the experience and the task on its whole instead of the language and SLS. It is an important finding that language or adaptation choice did not influence the participants' attitude in this case. Companies might find further investigation useful. Since participants' attitude about the instruction video did not change, they might have a positive attitude towards the video (and maybe also the product/service, company and brand) regardless of language choice. It is uncertain, however, whether their attitude will not change negatively in real life

cases. When customers buy a product, they might have a certain expectation about the service. So when a video is not adapted to their native tongue or a language they understand well enough, this might have a negative effect on their perception of the brand. Also, the participants in this study were recruited with the question if they wanted to build a Lego house (which might be a fun task for the participants) and at the same time help the researcher finishing her Master's degree. This might have had an influence on the attitude of the participants and how they rated their enjoyment and satisfaction, since most people feel better about themselves and the situation they are in when helping others.

Overall, the results of this study seem to be in line with findings on dubbing and subtitling (e.g. Wissmath, Weibel & Groner, 2009; d'Ydewalle et al., 1987; Mangnus, Hoeken, & van Driel, 1994; Poolman, 2011) that claim that these adaptation methods did not significantly differ in effectiveness. The results of the present study have shown that SLS also does not render a better understanding of foreign instruction videos, neither in a language the audience understands well (English), nor in a language the audience probably does not understand (French).

The suggestion that it seems possible for participants to watch instruction videos in English without any translation, because English is a lingua franca these days (Koolstra, Peeters and Spinhof, 2002), seems to be borne out by the present findings; most participants were able to build the Lego house with fewer mistakes when watching the English instruction video than when watching the French instruction video.

Mitterer and McQueen (2009) state that SLS can aid in the comprehension of video content since the audience might have the lexical knowledge to grasp the content, but they might have deficiencies in understanding the spoken audio because they are not used to the mappings between word and sound. This hypothesis is not confirmed by the findings of the present study, seeing that adding SLS (and thereby obviating the requirement to map sounds to lexical items in the foreign language) did not significantly improve participants' performance.

An alternative explanation might be that the visual instructions already provide enough information and that the participants therefore mainly focus on the visual instructions on the screen, instead of the SLS. Another possible explanation for the present findings is that the different sources of information might cause the reading of the subtitles less imperative (Bisson, Van Heuven, Conklin and Tunney, 2014) so that the participants ignored the subtitling in order to reduce cognitive load, seeing that they had to multitask as well. Mitterer and McQueen (2009) also concluded from their television study experiment that English spoken videos with English subtitles were better received than English spoken videos with Dutch subtitles,

and subtitling in general was better than no subtitling at all. The first assumption was not tested in this study, but the second assumption is not confirmed by the present findings.

Of course it should be noted that Mitterer and McQueen (2009) conducted a television study, while the current study with instruction videos requires more attention from the participants, a different (active) attitude, and a different kind of information processing. But the different outcomes make clear that in the case of instruction videos as marketing communication materials, it is necessary to do more research about the language and adaptation choices. since one cannot rely on earlier researches about television or movie experiments or dubbing and native language subtitling.

Neuman and Koskinen (1992) concluded from their SLS and foreign language learning study that the language proficiency of the participant (English, in this case) did influence the amount of words that were learned from the context. The higher the language proficiency, the more words were learned. Their research aim differs from this study, however. When companies decide to share their videos in a language their customers are less used to (like French), they have to make sure that their audience at least has a certain basic knowledge about this language. When this is the case, they can probably expect the audience to quickly adapt to this new way of adapting and sharing video materials, just like most people nowadays expect (international) videos on the internet to be in English. When this is not the case, in order to avoid the “rich get richer effect”, companies should make sure to have a sufficient amount of useful visual assistance that helps the customer enough to understand the instructions without using the audio.

Taylor (2005) concluded from his research among beginning and intermediate Spanish students that the beginning learners got confused or distracted by the SLS. This does not coincide with the results in this study when participants had to watch an SLS instruction video in a language they did not understand. Neither does it coincide with the findings of Hirose and Kamei (1993), who concluded that SLS in English had a positive effect on the listening comprehension of low, as well as intermediate, and high levels of English. A possible explanation for this difference in findings might be the fact that in this current experiment, the participants had to build the Lego house while watching the instruction video. Since they did not look at the screen the whole time, this multitasking might have affected the amount of attention that the participants paid to the SLS on the screen, so that it did not render either a positive or a negative effect on comprehension.

This explanation is supported by how participants listed their own watching behavior. In the questionnaire they were asked to rank the different elements (visual, audio and, in some groups, SLS). Use of visual elements, SLS and audio elements did not differ among the different participant groups: in general, the

participants said they used the visual instructions most. Overall the participants in the French groups (with and without SLS) were more convinced than the English language group participants that they would be able to complete the task better if the video was in Dutch. From this it can be concluded that although participants did not rate their enjoyment and satisfaction differently among groups, there still was some uncertainty among the participants.

Thinking about a real-world situation, we can assume this that could affect the way customers could perceive the fact that companies offer them instruction videos about the products or services they bought, without translation it in their native tongue and adding subtitling in the same language as heard in the audio in terms of customer satisfaction and brand appreciation. Therefore, further investigation of this topic is recommended.

Limitations and further research

The results and conclusion of this study have to be processed with caution due to the limitations of the experiment. First of all, the experiment is conducted with a small group of participants. Besides a risk of hasty generalization, his small sample group may not represent all Dutch customers making use of instruction videos. Most participants were recruited from around the university campus and they therefore had quite advanced English language skills and a certain basic knowledge of French as well, since Dutch secondary schools offer at least three years of French language. Also, most of the participants were aged between 18 and 25 years, so they are probably more used to online video platforms and English content on the internet. Due to time restrictions, the participants rated their own French/English and reading skills, but it is not sure if they made right estimations. Some participants might have overrated their understanding, especially the English instruction video participants, or some might have underrated their ability, for example the French instruction video participants who maybe understand more of the language than they thought. Last, a condition for participating in the experiment was Dutch nationality, so no conclusion can be made regarding an international group of customers or customers living in the Netherlands without a Dutch passport. Therefore, more research on this topic has to be done instead of drawing precipitous conclusions on such a small sample that may not represent Dutch customers in general.

It is not sure if the effects in this study would be the same for an audience with certain disabilities, like for example defective color vision, dyslexia, hearing impairments or low literacy. One participant in this experiment had color blindness but his outcomes of the experiment did not differ from other participants. The same counts for the few participants with dyslexia. However, since dyslexia and color blindness are frequent deficiencies among people, further research would be interesting in order to draw legitimate conclusions about an this type of audience and take account of their needs.

It is also not sure whether this experiment is close enough to the real life situation. First of all, while watching the video, participants were not allowed to rewind the video. In a real life it would be quite likely to repeat certain especially when one is not sure if the sentence or instruction was understood right, for example at the end of the Lego building instruction video when most participants were confused about the right color of the chimney. Next to that, most participants enjoyed doing the task despite the language struggle, and maybe the fact that they could help someone with their thesis, play with Lego or procrastinate a moment could have played a major role. But as consumers who bought a product they might have a different attitude towards an instruction video in a foreign language without any translation into their native language. Therefore it would be valuable to conduct experiments involving real life products and brands to measure and draw conclusions about brand experience and customer experience.

In this study, the participants had to multitask between watching the video, reading the SLS, listening to the instructions and building a Lego house. The participants rated their attention distribution themselves, but it is not sure whether they estimated correctly that they made primarily use of the visual instructions (more than SLS or audio instructions). Next to that, since eye-tracking studies have shown that the attention of the audience is always drawn to subtitles when they are displayed on the screen, it might be possible that the participants attention was drawn to the SLS subtitles on the screen, but because they did not read it consciously these subtitling might have done some harm to the focus of the participants. Further research using eye-tracking could indicate the distribution of the participants' attention to when multitasking and investigate whether they look at the SLS subtitles.

The language choice for this study was English, since English is seen as a lingua franca these days, and French, because of the feasibility of the study. However, it would be interesting to see the outcomes of a similar experiment with participants from another country, or conduct the experiment using other languages like Spanish, since there is a large Spanish market, or even with languages the audience cannot understand at all, such as Chinese or Sinhala. Also, it would be interesting to add an additional participant group to this current experiment with an instruction video in Dutch, in order to compare the difference attitude and customer experience between an instruction video the audience completely understands and the instruction videos in a language they are not or less used to. Another possibility for further research would be comparing SLS instruction videos with regular subtitling.

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