

## Review Article

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# Subtitling and Eye Movements: Insights from Proficient Viewers

Rachid Ed-Dali 

## Abstract

**Background/purpose.** The popularity of foreign-language films and shows with subtitles has been driven by their cost-effectiveness in comparison to audio dubbing. The primary objective of this research was to explore the reading and viewing behaviors of proficient learners in the contemporary era, characterized by significant progress in eye-tracking technologies. These advancements have provided researchers with the capability to precisely analyze eye fixation patterns, offering valuable insights into how individuals engage with written and visual content.

**Materials/methods.** The study's focus was on adults between the ages of 20 and 40 years old who watched videos with English language soundtracks and Standard Arabic subtitles, as well as videos with Moroccan Arabic and Standard Arabic soundtracks and subtitles. To assess the impact of different subtitling speeds on reading behavior, participants were exposed to varying speeds. Also, a detailed questionnaire was administered to the participants after the sessions in order to obtain further information and the collected data were then analyzed using descriptive statistics.

**Practical implications.** The findings of this study revealed that doctoral candidates spent less time focusing on the subtitles, and some even completely ignored them. Master's students exhibited similar eye movement patterns to the doctoral candidates, while undergraduates had longer fixation times on the subtitles.

**Conclusion.** This research provides valuable insights into how the speed of subtitles influences viewer behavior and has implications for language learning and the production of audiovisual content. By understanding how different subtitling speeds affect reading behavior, language learners and content creators can make informed decisions to enhance the learning experience and optimize the production of audiovisual materials.

## 1. Introduction

The emergence of significant technological tools in the 20th century facilitated cross-cultural communication and introduced much of the world to new cultures and routines. The advent of television initially enabled local viewers to recognize new cultural habits and broaden their horizons locally. Subsequently, the second part of the 20th century was distinguished by the introduction of novel cultures to these same local spectators. The employment of subtitling and dubbing during this era held immense importance, since it facilitated the acquisition of new cultural aspects on a global scale. Barriers posed by language as an obstacle to effective communication and cultural exchange gradually diminished through the widespread adoption of subtitling, which encouraged viewers to explore new movies and genres.

The impact of subtitling extended beyond facilitating cross-cultural communication, since it also served to enhance individuals' learning abilities. Extensive research conducted during the 1970s underscored the importance of subtitling in language acquisition (Price, 1983). However, learner capacity to divert attention from a video to its subtitles whilst viewing is critical, since it transforms the viewer into a reader (Montero Perez et al., 2013). Psycholinguists have made efforts to elucidate the process through the application of Dual Coding Principle (Paivio, 1986), which posits that inductive tasks are processed separately by distinct channels in the human brain. This approach enhances learning as learners benefit more from reading video subtitles than just mere words (Mayer, 2009).

In a separate study, Winke et al. (2010) unveiled the significance of subtitling, demonstrating that subtitles can enhance the cognitive process and reinforce the acquisition and learning of new lexical items. Similarly, second-language subtitles hold great importance as they contribute to the reduction of the apprehension caused by conventional approaches and encourages learner-viewers to derive additional value from what is predominantly viewer-selected material (Danan, 2004). Frequent exposure to particular content offers several advantages, as the audience not only assumes the role of a listener but also actively seeks to derive benefits from repeated material in an inductive manner (Vanderplank, 2016). In another study, Montero Perez et al. (2013) investigated the effectiveness of subtitles and their contribution to improving listening comprehension, and demonstrated the ability of learners to comprehend second-language videos.

In their research, Mitterer and McQueen (2009) conducted an investigation into the ramifications of regular exposure to subtitled programs. Their findings revealed that individuals who regularly read subtitles exhibited a tendency to rapidly shift their gaze towards the subtitles, in contrast to those who infrequently watched subtitled content. The various psycholinguistic processes were also demonstrated by Danan (2004), who formulated his argument on the Dual Coding Principle, as proposed by Paivio (1986), to signify the existence of three distinct systems encompassing auditory, visual, and textual elements. In 2003, Markham and Peter carried out an investigation to examine the effectiveness of first-language subtitles. Their research emphasized the crucial role that these subtitles play when compared to videos that lack any form of subtitling. Furthermore, their study analyzed the performance of learners at both low and high levels and revealed that first-language subtitling is more suitable for low-level learners, whereas high achievers derive greater benefits from second-language subtitles.

As is typical of many nations worldwide, Morocco imports a significant amount of foreign programs and movies. The First and Second Moroccan Channels bear the responsibility of translating the content (Ed-dali & Elasri, 2020). Dubbing serves as the sole means of translation, with the majority of programs being translated into French. This preference for French translation stems from the country's reliance on French as a second language. The emergence of novel technological instruments has engendered transformations within Moroccan society, endowing individuals with the requisite resources to challenge the monopoly of the Moroccan government.

The advent and proliferation of novel media tools and applications such as TikTok, Instagram Reels, and YouTube Shorts have facilitated numerous professional and non-professional translators in Morocco to reap substantial financial gains. Concise videos, featuring the original soundtrack and subtitles, have captivated the interest of Moroccan viewers keen on exploring the essence of the Western world. These subtitled short videos are viewed by individuals of both lay and intellectual backgrounds. This presents an opportunity to explore whether intellectually inclined viewers, possessing a proficient command of either the English or French languages, also direct their focus towards the subtitles or rely solely on the accompanying soundtrack whilst viewing these types of videos.

## 2. Literature Review

The contemporary world has undergone significant transformation owing to the widespread adoption of a novel digital milieu characterized by the proliferation of visual images and texts (Noar, 2006). These media possess both favorable and unfavorable attributes that affect the convictions, conduct, and ideology of the observer who perceives their ability to regulate the substance of what they view. The proliferation of new media devices, specifically the smartphone and tablet personal computer, has provided users with the essential tools to explore a whole new world, replete with both positive and negative attributes, albeit not always acknowledged (Martinho et al., 2017). As previously mentioned, the widespread adoption of these technological devices has led to a significant increase in research on subtitling and eye movements by both sociologists and psycholinguists, due to their profound social, cultural, and psychological effects (Kruger & Steyn, 2014).

Since 1985, the Belgian scholar d'Ydewalle and his associates have been at the forefront of research on eye movement and subtitling. Their investigations have yielded insights into the benefits and limitations of eye tracking and subtitling in education (d'Ydewalle et al., 1985, 1987, 1991; d'Ydewalle & De Bruycker, 2007). Additional scholars have also illuminated the significance of ocular movement in their research and have exhibited their efficacy in the domains of reading and comprehension, particularly in the context of second language learning and acquisition (Roberts & Siyanova-Chanturia, 2013). Over the course of the previous decade, the act of viewing subtitled programming, particularly movies, was primarily relevant to specific demographics and age groups (De Bruycker & d'Ydewalle, 2003). However, the extensive dissemination of brief videos within the last 4 years has stimulated and inspired a greater number of viewers to become active participants in this process. Short videos, ranging from 1 to 5 minutes in length, have encouraged both young individuals and adults to engage with their preferred genres and to read accompanying subtitles (Wang & Fu, 2020).

In 1983, Carpenter and Just conducted a study on the eye movements of bilingual individuals. Their findings revealed that eye movement direction is influenced by the language being read and the number of characters present. Additionally, their study examined the extent of eye fixation and concluded that viewers tend to favor subtitles with a length of 25-30 characters and commonly used words, as they need to allocate a greater amount of time to unfamiliar vocabulary. Readers are inclined to overlook certain commonplace words while perusing a text, as the brain promptly identifies them automatically owing to their frequent occurrence in the lexicon (Rayner & Well, 1996). Duchowski (2002) and Irwin (2004) conducted additional research on ocular movement and fixation, and revealed that when lexical items are intricate and unfamiliar, the reader-viewer expends more effort attempting to unravel its structure and semantic significance. This procedure often leads to ennui and vexation.

According to Kruger and Steyn (2014), the majority of research conducted in the fields of applied linguistics and psycholinguistics categorizes the screen into two primary divisions, namely

the image area and the subtitling area. The authors further noted that their observations and subsequent remarks were primarily based on the analysis of either the subtitles or the images. The majority of these prior studies have emphasized the quantity of visual consumption and analyzed the various types of ocular fixation (De Bruycker & d'Ydewalle, 2003; Liao et al., 2021; Lin et al., 2016), yet failed to establish whether the subjects under examination actually read the subtitles or merely glanced at them. Consequently, the current study aimed to elucidate this observation and to ascertain whether or not Moroccan advanced learners comprehend subtitles or simply glance at them, as posited by Kruger and Steyn (2014).

Whilst the research pertaining to subtitling and eye movement is intriguing, it remains insufficient in its scope, since it is mostly limited to the endeavors of certain scholars in specific regions and contexts. The majority of scholars in this field have yet to explore this topic in depth, instead opting to rely upon the studies and investigations conducted by the prominent Belgian scholar d'Ydewalle and his associates. It is evident that, in certain instances, an investigation may be suited to a specific nation or culture, yet inappropriate for other contexts or countries owing to significant cultural disparities (Ravindran & Myers, 2012). In addition, research on subtitling and eye tracking and their relationship with the learner's accuracy and age has been overlooked with the focus primarily on eye movement and second language acquisition (Winke et al., 2013).

Kruger et al. (2014) conducted a study in South Africa pertaining to subtitling in Sesotho and English as a second language. Their findings revealed that the majority of viewer-readers tend to eschew subtitles in their primary language, while preferring to concentrate on reading subtitles in their secondary language. The results of the study indicated that more than 50% of participants abstained from utilizing Sesotho, while a mere 20% declined to view English language subtitles. It is notable that the study was conducted in a country with diverse social, cultural, and economic experience, which may have influenced the study's outcome. In the current study, on the other hand, the aim was to investigate the Moroccan context and to determine whether the local audience has a preference for subtitles in their primary or secondary language, or whether they express interest in both options.

Bisson et al. (2014) conducted a study on the eye movement and reading behaviors of individuals who expressed interest in viewing first and second-language subtitles. The study was conducted within a higher education college setting, with Dutch as the target language. The findings of their study indicated that eye fixation levels were comparable for both languages. Additionally, the participants exhibited a preference for discarding certain lexical items in the subtitles of both languages. As previously mentioned, additional research pertaining to subtitling and saccade was conducted by d'Ydewalle and his associates. In the Netherlands, students in grades two, four, and six were observed and presented with subtitles in their native language. The investigation's findings revealed that the second-grade students exhibited a preference for disregarding subtitles due to their perceived lack of precision and smoothness (d'Ydewalle & Van Rensbergen, 1989). In an alternative investigation, fourth-grade students were exposed to videos featuring foreign language soundtracks with subtitles in their native language (d'Ydewalle, 2002). The findings of that study indicated that the foreign language soundtrack was entirely disregarded when the subtitles were presented in their native language. However, the subjects under scrutiny opted to largely ignore the subtitles due to their tender age and limited proficiency.

In 2007, d'Ydewalle and De Bruycker extended their inquiry to encompass both juvenile and mature aged individuals with an investigation conducted as a comparative analysis of the reading patterns exhibited by students in grades five and six, as well as the performance of adults. Their findings indicated that children displayed a proclivity towards longer fixation periods on specific lexical items. Additionally, the researchers noted that eye movement duration among the students was brief, and in certain instances, they did not take into account the presence of subtitles. In 2015,

Laskowska et al. conducted a study aimed at examining the academic performance of Polish students. The study involved exposing the participants to videos featuring soundtracks in both English and Norwegian, accompanied by subtitles in their native language of Polish. The study's findings revealed that the duration of saccades and eye fixation were notably higher when the students were exposed to videos with Norwegian soundtracks, owing to their English language proficiency and precision. Additionally, the results indicated that eye fixation was prolonged when both the soundtrack and subtitles were in the English language, due to the students' inclination towards comparing the content of the soundtrack with the subtitles.

Specker (2008) conducted a qualitative study that focused on the examination of subtitles and their reading process. The study involved the analysis of various cases, with particular attention given to fixation counts and the duration of time allocated to specific words in the subtitles. In 2010, a comparable investigation was conducted by Perego et al. in Italy, which examined the impact of subtitles on 41 participants. The study involved the selection of 28 Italian subtitles and Hungarian language soundtracks in order to assess their effects on the subjects. The investigation was conducted with meticulous attention given to time counts and fixation so as to ensure highly accurate reporting. The findings revealed that 67% of the subjects' time was dedicated to subtitle reading, while only 33% was spent viewing the images. Rajendran et al. (2013) worked with 24 participants who watched 1-minute videos and their eye shifts and time fixation were also considered.

A study was conducted in Italy to investigate the impact of subtitling on ocular movements among intermediate students learning English as a secondary language. The research was undertaken by Ghia (2012), who exposed 13 participants to 6-minute videos containing both literal and non-literal translations. During the viewing of the videos, the researcher focused on the ocular movements of the participants and documented the various fixation types, as is customary among most scholars. Krejtz et al. (2013) conducted a study on saccade that differed in approach from previous research, as they presented the investigated cases with brief videos containing cuts. The data analysis revealed that the majority of participants did not feel compelled to re-read the subtitles following the cuts, while a minority engaged in inductive reading, perceiving the text as containing novel lexical items and semantic meanings.

Jenesma et al. (2000) posited that the utilization of subtitles has a transformative effect on the viewing process. The authors contended that the incorporation of subtitles and captions converts viewers into readers. The study involved six participants, three of whom were deaf, who were exposed to videos with and without subtitles, and their viewing behavior was meticulously monitored. The researchers noted that the participants' focus shifted to the subtitles once they were presented, and the majority of their attention was directed towards the lower (subtitles) part of the screen rather than the entire display. Their findings revealed that a significant proportion of time, specifically 84%, was allocated to the subtitles, while only 14% was dedicated to the image. However, it is important to consider that their study had several limitations. The sample size was relatively small, consisting of only six participants, three of whom were deaf. Furthermore, the videos watched by the participants were only 11 seconds in duration, which is considerably shorter than those used in other studies. Additionally, the video clips lacked any accompanying soundtrack.

Langton et al. (2008) espoused a comparable perspective and proposed that subtitles and captions transform viewers into readers. The presence of subtitles positioned at the lowermost part of the screen subconsciously compels the eyes to shift towards the bottom of the screen, not solely due to the semantic significance sought by the human brain, but also owing to the abrupt alterations in the screen's configuration brought about by the appearance of the subtitles. Szarkowska et al. (2016) conducted a study on the impact of subtitle speed on viewer attention and comprehension. Their findings indicated that faster subtitle speeds resulted in increased time

allocation to their being read. Conversely, slower subtitle speeds enabled viewers to complete their reading quickly and shift their focus back to the visual content. The study also suggested that high-speed subtitles prompted viewers to exert greater effort in reading them, in order to fully comprehend the content in a timely manner.

The role of the viewer's characteristics is considered to be a significant factor in determining the frequency of attention shifts. In a study conducted by Kruger et al. (2015), the difference between deaf and normal-hearing viewers was investigated. The study's findings indicated that deaf viewers more rapidly read subtitles and then shifted their attention back to the visual content, whereas the normal-hearing viewers had a tendency to read the subtitles and then return to the visual content in order to compare it with the soundtrack. In a study by Szarkowska (2011), indistinguishable findings were reported based on deaf participants' reactions and that they also shifted their eye movement to the image swiftly after having read the subtitles. Diao et al. (2007) shed light on viewer fluency and accuracy, and revealed that those with higher fluency did not encounter hardships while reading subtitles and that their fixation time was limited in comparison with those with lower fluency.

Robson (2004) further contrasted the performance and reactions of deaf and normal-hearing participants. Their survey concluded that the comprehension of those with normal hearing was more advanced regardless of their intellectual level due to English being a second language for the deaf participants who were native sign language users. Furthermore, and as previously mentioned, the nature of the viewer and the genre of the visual content are significant factors in determining the amount of devotion and time fixation. In 1989, d'Ydewalle and Van Rensbergen observed that second-grade primary school students did not pay much attention to subtitles when watching an action movie. They concluded that, in general, the proficiency level of second-graders did not completely allow them to follow all the subtitles when the pace of exposition was fast. The second explanation is germane to the genre of the content itself, which included a considerable level of action, and such effects naturally drive viewers to focus on the image rather than the subtitles.

Romero-Fresco and Pérez (2015) conducted a crucial investigation into the genre and speed of subtitles and their actual effects on viewer comprehension. Their study included two recorded television programs from BBC One and BBC Two, plus one live event linked to the 29th Olympic Games held in Beijing in 2008. Their empirical study took place during August to October of that year, and Romero Fresco and Pérez's (2015) observations indicated that more difficulties were encountered by viewers while watching the live program compared with the recorded television program clips. They noted that while studying the viewers' watching behaviors that in most cases they studied, the viewers spent approximately 90% of their time reading the subtitles while only 10% was devoted viewing the image area of the screen.

### 3. The Current Study

As previously mentioned, the proliferation of technology has enabled the general public to gain knowledge about diverse customs and practices. In order to cater to a diverse audience from different nationalities, most television programs are broadcast in the English language or have been translated into this global lingua franca (Dvorghets & Shaturnaya, 2015). Furthermore, media networks are motivated to share the preferences of their subscribers with other advertising entities and individuals who aim to fulfill the subscribers' needs through the use of artificial intelligence and a drive to generate a profitable return (Paek & Pan, 2004). As a result, content filtering techniques are employed that rely upon both interlingual and intralingual methods of translation.

In general, the Moroccan consumer exhibits a keen interest in novel technological advancements and evinces a propensity to procure and utilize them (Amine & Cavusgil, 1983). Media platforms such as Instagram Reels, YouTube Shorts, and TikTok enjoy widespread usage in

the nation and command a substantial viewership and user base (Aderdor, 2022). The current study endeavors to investigate and elucidate the impacts of saccade on advanced Moroccan learners. Previous research conducted in various countries has primarily focused on examining the consequences of viewing and reading subtitles (d'Ydewalle et al., 1985, 1987, 1991; d'Ydewalle & De Bruycker, 2007; d'Ydewalle & Van Rensbergen, 1989; Irwin, 2004; Jensema et al., 2000; Kruger et al., 2014, 2015; Kruger & Steyn, 2014). The participants in the current study, as viewer-readers, were exposed to videos with and without subtitles in order to assess their effects on the subjects under investigation.

The study also scrutinized the diverse tactics employed by proficient Moroccan learners when perusing subtitles in order to sustain their comprehension. It is considered imperative to ascertain whether advanced learners move seamlessly between visual and textual components or selectively omit specific lexical items as a means to upholding their overall grasp of the material. Finally, the study investigated various forms of fixation in order to assess the proficiency level of advanced learners and their ability to rapidly recognize and recall lexical items, including longer words in both the English and Arabic languages.

#### 4. Hypotheses

The bulk of prior research on subtitling and saccade have mainly focused on the reading area and image area of the screen (Bisson et al., 2014; Carpenter & Just, 1983; Krejtz et al., 2013; Langton et al., 2008; Roberts & Siyanova-Chanturia, 2013; Romero-Fresco & Pérez, 2015), and the majority of scholars have examined the reading and viewing behaviors of individuals from various age groups and educational levels (Lin et al., 2016). However, the current study opted to concentrate on the advanced Moroccan learner, whose official language is standard Arabic, alongside other national languages such as Amazigh and Moroccan Arabic. Thus, the current study considers the following hypothesis:

**H1:** Advanced Moroccan learners are more likely to focus on a video image than subtitles.

In order to investigate this hypothesis, the participants were segregated into three primary cohorts. The first cohort involved doctoral students, the second cohort encompassed master's students, and the third cohort consisted of undergraduate students studying in their final semester (semester six). Also, research on eye movement and subtitles was conducted so as to investigate the relationship between saccade and first-language subtitles. For this reason, it is also salient to highlight the following second hypothesis.

**H2:** Advanced Moroccan learners skip subtitles written in their mother tongue.

In this case, it is imperative to assess the use of the native language, specifically Amazigh and Moroccan Arabic, despite the latter's lack of codification, to ascertain whether participants exhibit patterns of ocular fixation or actively avoid them.

#### 5. Methodology

##### 5.1. Participants

The current study was conducted at the Faculty of Letters and Human Sciences in Marrakech, Morocco, and involved a sample of 30 undergraduate students, 20 master's students, and 10 doctoral students. Each cohort was evenly split between the genders, with the undergraduate cohort having 15 male and 15 female students, while the master's group had 10 male and 10 female students, and the doctoral group consisted of five male and five female students. All of the participants were aged between 20 and 40 years old, and were specifically chosen from the English department at the target university. Moreover, the study included a diverse representation of

Moroccan cities, since both the doctoral and master's programs' selection process entails entrance examinations and the consideration of students from various universities across Morocco.

The selection of the different age groups was not arbitrary and took into account the ability to make a smooth comparison between the different age groups. Moreover, the study took into consideration the distribution of a questionnaire at the end of the study along with the deductive observation of the viewing and reading behavior of the participants. The questionnaire aimed at checking the participants' comprehension of the content videos they watched.

## **5.2. Procedure**

The study's 30 undergraduate, 20 master's, and 10 doctoral students were divided into different groups. The academic grades of the undergraduates' first five semesters were considered in the selection of the participants, and the top high achievers in the English Department were selected, subject to their voluntary agreement to participate in the empirical experiment.

The participants were tasked with viewing two 5-minute videos and two 1-minute videos in order to provide each viewer with the opportunity to experience different genres. The soundtracks of two videos were in the English language with Arabic subtitles, and two videos were in Moroccan Arabic with the same language subtitles, although as previously stated Moroccan Arabic is not a codified language.

In order to assess the impact of caption size on the participants' reading behavior, they were each instructed to view the same video three times. This repetition was required since the subtitles had been intentionally designed in different sizes; large, normal, and small. By examining how the participants' reading behavior varied according to the varying caption size viewed, the study aimed to gain insights into the influence of caption size on viewers' overall experience and comprehension of video content.

All of the participants were instructed to sit in close proximity to the viewing screen, at a distance of approximately 1.5 meters, to enable monitoring of their ocular movement during the viewing of four short videos. In addition, a data projector was employed in the experiment owing to the expansive dimensions of its display.

A questionnaire was distributed to the subjects under investigation for them to complete in order to verify their understanding. Prior to viewing the videos, the participants were apprised about the questionnaire's existence to ensure their undivided attention whilst viewing the videos. The study's objective, however, was not disclosed to them in order to regulate their impromptu conduct.

## **5.2. Materials**

The first 5-minute videos were extracts from one of Oprah Winfrey's talk shows and a documentary on animals on National Geographic Wild. The 1-minute videos were taken from a famous Moroccan series entitled "The Daughter's Guard" (bnāt l'sās) and a documentary on the Second World War entitled "Apocalypse." The soundtrack of the first two videos was in American English with Modern Standard Arabic subtitles, while the language of the 1-minute original soundtrack videos was Moroccan Arabic with Moroccan subtitles and Standard Arabic with Modern Standard Arabic subtitles. The selection of the videos was not arbitrary, but rather, it was based on the participants' familiarity with the lexical items in the subtitles and soundtracks, as well as the word count of each video. Specifically, the first and second videos contained two-line subtitles, while the third and fourth videos featured single-line subtitles. It was a mandatory requirement of the study to classify the number of words and subtitle lines in order to gauge the velocity of the participants' ocular movement.

## 6. Results

As previously stated, the participants were classified into discrete groups according to their educational background, age, and gender. The doctoral, master's, and undergraduate students were allocated to three separate groups. During the viewing of the videos, their viewing performance was meticulously monitored and video recorded for subsequent analysis, given the potential challenges associated with reconvening the participant groups due to their demanding schedules and time constraints. The pace of the videos varied depending on their nature and genre, with the first video featuring an approximate rate of 140 words per minute (wpm), the second 114 wpm, the third 200 wpm, and the fourth had a rate of 163 wpm.

Examination of the ocular movements of the subjects revealed that 70% of the doctoral candidates perused the captions and observed the visual content, whereas 30% disregarded the captions. In contrast, 75% of the master's students viewed the visual content and read the captions, while 25% watched the videos without looking at the captions. Finally, 76.66% of the undergraduate students watched the videos and perused the subtitles, while 10% refrained from reading the subtitles altogether, and 13.33% solely read the subtitles without viewing the accompanying content. Moreover, it is imperative to take into account the frequency and proportion of the instances during the examination to circumvent ambiguity. Table 1 illustrates that the majority of the respondents were undergraduates, with 33.3% being master's students, and 16.7% were doctoral students.

**Table 1.** Eye movement by participants' educational background

|           |                        |                       | Eye movement |          |                      | Total  |
|-----------|------------------------|-----------------------|--------------|----------|----------------------|--------|
|           |                        |                       | On subtitles | On image | On subtitles & image |        |
| Education | Doctoral students      | Count                 | 0            | 3        | 7                    | 10     |
|           |                        | % of eye movement     | 0.0%         | 27.3%    | 15.6%                | 16.7%  |
|           |                        | Standardized Residual | -0.8         | 0.9      | -0.2                 |        |
|           | Master's students      | Count                 | 0            | 5        | 15                   | 20     |
|           |                        | % of eye movement     | 0.0%         | 45.5%    | 33.3%                | 33.3%  |
|           |                        | Standardized Residual | -1.2         | 0.7      | 0.0                  |        |
|           | Undergraduate students | Count                 | 4            | 3        | 23                   | 30     |
|           |                        | % of eye movement     | 100.0%       | 27.3%    | 51.1%                | 50.0%  |
|           |                        | Standardized Residual | 1.4          | -1.1     | 0.1                  |        |
| Total     | Count                  |                       | 4            | 11       | 45                   | 60     |
|           | % of eye movement      |                       | 100.0%       | 100.0%   | 100.0%               | 100.0% |

As previously mentioned, the literature has provided insight into saccades and their effects (Kruger & Steyn, 2014; Liao et al., 2021; Mestres & Pellicer-Sánchez, 2019). Jenesma et al. (2000) discovered in their investigation that 84% of cases focused on subtitles, while only 14% concentrated on the video image itself. In a different context, Perego et al. (2010) reported that 67% of participants read the subtitles, while the remaining solely watched the video image. The

study carried out by Kruger et al. (2014) revealed that 43% of participants focused their attention on the subtitles, while 43% directed their attention towards the speaker and slides, and the remaining 14% solely viewed the video image. Furthermore, analysis of the entire participant pool indicated that 6.7% dedicated their time to reading the subtitles, 75% viewed the image while simultaneously reading the subtitles, and 18.3% solely viewed the video image with the original soundtrack.

However, it is of paramount significance to scrutinize whether the genre of the video clip affected the eye movement of the participants or whether their behavior was a habitual movement performed by the brain. Analysis of the first 5-minute videos indicated approximate results with some differences. In total, 11 (18.3%) of the participants watched just the video image without reading the subtitles at all, and the majority of these were postgraduate (doctoral or master's) students. However, in the majority of cases, the participants devoted 2-3 seconds to the subtitles before returning to viewing the image. The analysis also revealed that all of the participants were capable of reading the subtitles before the end of the first 4-5 seconds because of the slow speed of the subtitles and the soundtrack.

The third and fourth videos were very short, at just 1 minute each, and presented with Moroccan and Standard Arabic soundtracks and subtitles. Analysis of the participants' saccade showed that most participants did not look at the subtitles while watching the third video ("The Daughter's Guard" or *bnāt l'sās*). In 81.7% of the cases, the participants did not read the subtitles at all, and 16.7% devoted less than 1 second to reading the subtitles, as can be seen in Table 2. It is evident, therefore, that the participants reduced their dependence on the subtitles when both the soundtrack and subtitles were presented in the participant's mother tongue.

**Table 2.** Participants' eye fixation time when viewing video three

|       |      | Frequency | %     | Valid % | Cumulative % |
|-------|------|-----------|-------|---------|--------------|
| Valid | 1.00 | 49        | 81.7  | 81.7    | 81.7         |
|       | 2.00 | 10        | 16.7  | 16.7    | 98.3         |
|       | 3.00 | 1         | 1.7   | 1.7     | 100.0        |
| Total |      | 60        | 100.0 | 100.0   |              |

Examination of the participants' subtitle reading conduct during observation of the fourth short (1 minute) video revealed that 76.6% focused solely on the video image, whereas 20% allocated less than a second to reading the subtitles, and 3.3% of the participants dedicated less than 2 seconds. In the third video, all of the doctoral students viewed only the video image, and in the fourth video, one student spent less than 1 second reading the subtitles.

Age is another crucial factor that has been investigated in the literature. d'Ydewalle and Van Rensbergen (1989) examined primary school students and found that second graders devoted less time to reading subtitles compared with fourth and sixth graders, depending on the genre of the video clip they viewed. In 2007, d'Ydewalle and De Bruycker expanded this research to incorporate adults as well. Their study investigated the saccade and eye fixation of participants and discovered that children's eye fixation on subtitles was longer compared with the reading behavior of the adult participants.

**Table 3.** Eye movement by participants' age

|             |                   |                   | Eye movement |          |                      |       |
|-------------|-------------------|-------------------|--------------|----------|----------------------|-------|
|             |                   |                   | On subtitles | On image | On subtitles & image |       |
| Age (years) | 19-21             | Count             | 4            | 3        | 23                   | 30    |
|             |                   | % of eye movement | 100.0%       | 27.3%    | 51.1%                | 50.0% |
|             | 21-25             | Count             | 0            | 5        | 12                   | 17    |
|             |                   | % of eye movement | 0.0%         | 45.5%    | 26.7%                | 28.3% |
|             | 25-40             | Count             | 0            | 3        | 10                   | 13    |
|             |                   | % of eye movement | 0.0%         | 27.3%    | 22.2%                | 21.7% |
| Total       | Count             | 4                 | 11           | 45       | 60                   |       |
|             | % of eye movement | 100.0%            | 100.0%       | 100.0%   | 100.0%               |       |

In the current study, the analysis of the participants' age and their eye movement revealed age to be a significant agent, as can be seen in Table 3. Participants aged 25-40 years old viewed both the subtitles and video images rather than just the subtitles. Furthermore, in the case of participants aged 21-25 years old, they were more proficient in considering just the video image without reading the subtitles compared to participants of other ages. Both Miller (1969) and Rayner (1998) demonstrated in their respective studies that children's duration of attention towards video images was extended as a result of the video's inherent characteristics and their level of competence.

## 7. Discussion

Advanced and proficient learners, especially doctoral students, were revealed to frequently exhibit a heightened level of fluency in the language of the films watched, leading to their decreased dependence on subtitles. This enhanced language proficiency enabled them to better understand the spoken words, allowing them to become fully engaged in the visual and auditory aspects of the film, without the need to rely on reading subtitles. Moreover, owing to their advanced cognitive abilities, the doctoral students were shown to possess superior contextual comprehension and inference skills. This helped them to effortlessly grasp the meaning conveyed through the films' dialogue by being able to rely upon contextual cues, tone, and visual indicators, without the need to read every presented subtitle.

Furthermore, as doctoral candidates, they often have the opportunity to attend international conferences and to collaborate with scholars from different countries (Hauss, 2021), thereby fostering cross-cultural communication and providing a platform for discussion and knowledge exchange about foreign films and media. These kinds of interactions can result in a deeper understanding of different cultural practices and societal norms, enabling doctoral candidates to better appreciate the context of foreign films and media on a much more profound level.

Moreover, academic research undertaken during doctoral studies often involves the studying of foreign literature, theories, and philosophies (Choy et al., 2015). This exposure to diverse intellectual traditions not only enriches their own academic work, but also exposes them to different ways of thinking and interpreting the world. As a result, when they subsequently engage with foreign films and media, they are better placed to spot cultural nuances, metaphors, and symbolism that might otherwise be missed by those with more limited exposure to other languages

and cultures. The critical and analytical skills developed during doctoral studies also enables candidates to distinguish the underlying messages and themes conveyed through foreign films and media. As such, doctoral students may be said to be better able to identify and appreciate the director's artistic choices, narrative techniques, and cinematic devices used, which may not be so immediately apparent to the casual viewer. This more comprehensive level of understanding allows doctoral students to engage with foreign films and media on a more intellectual and esthetic level, transcending the need for subtitles to comprehend a film's plot or dialogue.

On the other hand, most university undergraduates utilize subtitles for a variety of reasons, as demonstrated by their feedback in the current study. Challenges such as accents, dialects, or rapid speech can often hinder the understanding of spoken conversation, even if presented in the viewer's mother tongue. Subtitles are essential in elucidating the dialogue, since it allows audiences to track along while hearing and thereby strengthens the link between the spoken word and its accompanying written text, which enhances their grasp of the language. Visual learners also tend to comprehend and retain information better through reading (Woolley, 2010). Subtitles not only aid in viewer understanding, but also provide additional details like character names, sound effects, and song lyrics, offering a more comprehensive understanding of the content. Captions act as a visual guide, keeping viewers engaged and enhancing their viewing experience. Another factor was found to relate to viewers' reading habits. Numerous people acquire the practice of watching content with subtitles due to their prolonged exposure to subtitled foreign language films and videos. The current study's findings demonstrated this behavior, emphasizing the importance of captions in facilitating comprehension and memory retention.

## 8. Conclusion

The objective of this exploratory investigation was to scrutinize and analyze the viewing and reading patterns of advanced learners. The study exclusively focused on university students from the English department of a Moroccan higher education institution, owing to the genres and languages of the soundtracks. The study aimed to underscore the importance and impact of certain determinants such as age, education, and gender on the viewers' reading behaviors. Numerous prior studies have addressed the issue of subtitling and eye movement in specific social and pragmatic contexts (De Bruycker & d'Ydewalle, 2003; Jensema et al., 2000; Kruger & Steyn, 2014; Laskowska et al., 2015; Vanderplank, 2016; Winke et al., 2013). The author of the current study considered it imperative to contemplate this topic of study from the context of Moroccan advanced learners.

Examination of the ocular movement patterns of the subjects revealed a number of significant discoveries. First, the educational background and level of expertise of the participants were found to be pivotal factors in this investigation. The majority of doctoral candidates exhibited a tendency to devote less time to reading subtitles due to their elevated level of proficiency in comparison to the other participants, with some of them disregarding the subtitles altogether. Additionally, the saccadic behavior of the master's students was found to be comparable to that of the doctoral candidates, while the undergraduate students displayed longer fixation times in relation to the other groups, having allocated more time to the reading of the subtitles.

An additional discovery is pertinent to the duration, velocity, and dialect of the captions. Single-line captions expedited ocular movement and reduced fixation duration, irrespective of the degree of expertise. The undergraduate students were able to effortlessly and expeditiously peruse the single-line text and then revert back to viewing the visual content. Furthermore, saccade was also observed even when the soundtrack and captions were presented in the same language. One third of the subjects shifted their gaze towards reading the captions, despite the use of Moroccan Arabic

and Modern Standard Arabic languages having been used for both the captions and the video soundtracks.

## 8. Suggestions

The current study, like many others, is not without certain limitations. The sample size of the doctoral students was constrained by their limited representation within the English department at the researcher's university. Also, the scope of the study was restricted to the English language department at the Faculty of Letters and Human Sciences and excluded participants such as those studying natural sciences or medicine. This was necessitated by the study's focus on investigating the behavior of advanced language learners. Several scientific students were known to possess a high level of proficiency; however, their ability to participate in such experimental research was hindered by time constraints due to their schedules. Consequently, future research could focus on scrutinizing the eye movement and reading behaviors of scientific learners in order to evaluate the extent of saccade and eye fixations across different academic areas.

## Declarations

**Author Contributions.** The article was written by a single author, who read and approved the final published version of the article.

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## References

- Al-Omari, A. (2024). The impact of artificial intelligence on the school management: a study of opportunities and challenges in Jordan. *INTED2024 Proceedings*, 5478-5486. <https://doi.org/10.21125/inted.2024.1418>
- Aderdor, R. (2022). *The Use of Social Media by Rural Moroccan Women: Communication, Learning and Identity* [Master's thesis, Hamad Bin Khalifa University, Qatar]. <https://www.proquest.com/openview/799d73042f1bac8db2fc790341e2fe8b/1?pq-origsite=gscholar&cbl=2026366&diss=y>
- Amine, L. S., & Cavusgil, S. T. (1983). Mass media advertising in a developing country: the case of Morocco. *International Journal of Advertising*, 2(4), 317-330. <https://doi.org/10.1080/02650487.1983.11104985>
- Bisson, M. J., Van Heuven, W. J., Conklin, K., & Tunney, R. J. (2014). Processing of native and foreign language subtitles in films: An eye tracking study. *Applied Psycholinguistics*, 35(2), 399-418. <https://doi.org/10.1017/S0142716412000434>
- Carpenter, P. A., & Just, M. A. (1983). What your eyes do while your mind is reading. In K. Rayner (Ed.), *Eye movements in reading* (pp. 275-307). Academic Press. <https://doi.org/10.1016/b978-0-12-583680-7.50022-9>
- Choy, S., Li, M., & Singh, P. (2015). The Australian doctorate curriculum: Responding to the needs of Asian candidates. *International Journal for Researcher Development*, 6(2), 165-182. <https://doi.org/10.1108/IJRD-08-2014-0024>
- Danan, M. (2004). Captioning and subtitling, undervalued language learning strategies. *Meta*, 49(1), 67-77. <https://doi.org/10.7202/009021ar>
- De Bruycker, W., & d'Ydewalle, G. (2003). Reading native and foreign language television subtitles in children and adults. In J. Hyönä, R. Radach, & H. Deubel (Eds.), *The Mind's Eye* (pp. 671-684). Elsevier. <https://doi.org/10.1016/B978-044451020-4/50036-0>

- Diao, Y., Chandler, P., & Sweller, J. (2007). The effect of written text on comprehension of spoken English as a foreign language. *The American Journal of Psychology*, 120(2), 237-261. <https://doi.org/10.2307/20445397>
- Dvorghets, O. S., & Shaturnaya, Y. A. (2015). Developing students' media literacy in the English language teaching context. *Procedia-Social and Behavioral Sciences*, 200, 192-198. <https://doi.org/10.1016/j.sbspro.2015.08.051>
- D'Ydewalle, G. (2002). Foreign-language acquisition by watching subtitled television programs. *Journal of Foreign Language Education and Research*, 12, 59-77.
- D'Ydewalle, G., & De Bruycker, W. (2007). Eye movements of children and adults while reading television subtitles. *European Psychologist*, 12(3), 196-205. <https://doi.org/10.1027/1016-9040.12.3.196>
- D'Ydewalle, G., Muylle, P., & Van Rensbergen, J. (1985). Attention shifts in partially redundant information situations. In R. Groner, G. W. McConkie, & C. Menz (Eds.), *Eye movements and human information processing* (pp. 375-384). North-Holland.
- D'Ydewalle, G., Praet, C., Verfaillie, K., & Rensbergen, J. V. (1991). Watching subtitled television: Automatic reading behavior. *Communication Research*, 18(5), 650-666. <https://doi.org/10.1177/009365091018005005>
- D'Ydewalle, G., & Van Rensbergen, J. (1989). 13 Developmental Studies of Text-Picture Interactions in the Perception of Animated Cartoons with Text. *Advances in Psychology*, 58, 233-248. [https://doi.org/10.1016/S0166-4115\(08\)62157-3](https://doi.org/10.1016/S0166-4115(08)62157-3)
- D'Ydewalle, G., Van Rensbergen, J., & Pollet, J. (1987). Reading a message when the same message is available auditorily in another language: The case of subtitling. In J. K. O'Regan & A. Levy-Schoen (Eds.), *Eye movements from physiology to cognition* (pp. 313-321). Elsevier. <https://doi.org/10.1016/B978-0-444-70113-8.50047-3>
- Ed-Dali, R., & Elasri, K. (2020). Influence and Dissemination of Solecism among Moroccan High School and University Students. *International Journal of Cognitive and Language Sciences*, 14(9), 747-754.
- Ghia, E. (2012). The impact of translation strategies on subtitle reading. In E. Perego (Ed.), *Eye tracking in audiovisual translation* (pp. 157-182). Aracne.
- Hauss, K. (2021). What are the social and scientific benefits of participating at academic conferences? Insights from a survey among doctoral students and postdocs in Germany. *Research Evaluation*, 30(1), 1-12. <https://doi.org/10.1093/reseval/rvaa018>
- Irwin, D. E. (2004). Fixation location and fixation duration as indices of cognitive processing. In J. Henderson & F. Ferreira (Eds.), *The interface of language, vision, and action: Eye movements and the visual world* (Chap. 3, pp. 105-133). Psychology Press.
- Jensema, C. J., El Sharkawy, S., Danturthi, R. S., Burch, R., & Hsu, D. (2000). Eye movement patterns of captioned television viewers. *American Annals of the Deaf*, 145(3), 275-285. <https://doi.org/10.1353/aad.2012.0093>
- Krejtz, I., Szarkowska, A., & Krejtz, K. (2013). The effects of shot changes on eye movements in subtitling. *Journal of Eye Movement Research*, 6(5), Article 3. <https://doi.org/10.16910/jemr.6.5.3>
- Kruger, J.-L., Hefer, E., & Matthew, G. (2014). Attention distribution and cognitive load in a subtitled academic lecture: L1 vs. L2. *Journal of Eye Movement Research*, 7(5), Article 4. <https://doi.org/10.16910/jemr.7.5.4>
- Kruger, J.-L., & Steyn, F. (2014). Subtitles and eye tracking, reading and performance. *Reading Research Quarterly*, 49(1), 105-120. <https://doi.org/10.1002/rrq.59>
- Kruger, J.-L., Szarkowska, A., & Krejtz, I. (2015). Subtitles on the moving image: An overview of eye tracking studies. *Refractory: A Journal of Entertainment Media*, 25, 1-14.

- Langton, S. R., Law, A. S., Burton, A. M., & Schweinberger, S. R. (2008). Attention capture by faces. *Cognition*, 107(1), 330-342. <https://doi.org/10.1016/j.cognition.2007.07.012>
- Laskowska, M., Szarkowska, A., Pilipczuk, O., & Oliver, A. (2015, March 5-6). *The influence of the original language of the film on subtitle reading* [Conference presentation]. III Polish Eye tracking Conference, Warsaw, Poland.
- Liao, S., Yu, L., Reichle, E. D., & Kruger, J. L. (2021). Using eye movements to study the reading of subtitles in video. *Scientific Studies of Reading*, 25(5), 417-435. <https://doi.org/10.1080/10888438.2020.1823986>
- Lin, J. J., Lee, Y.-H., Wang, D.-Y., & Lin, S. S. (2016). Reading subtitles and taking enotes while learning scientific materials in a multimedia environment: Cognitive load perspectives on EFL students. *Journal of Educational Technology & Society*, 19(4), 47-58. [https://www.j-ets.net/collection/published-issues/19\\_4](https://www.j-ets.net/collection/published-issues/19_4)
- Markham, P., & Peter, L. (2003). The influence of English language and Spanish language captions on foreign language listening/reading comprehension. *Journal of Educational Technology Systems*, 31(1), 331-341. <https://doi.org/10.2190/BHUH-420B-FE23-ALAO>
- Martinho, G., Magalhães, D., & Pires, A. (2017). Consumer behavior with respect to the consumption and recycling of smartphones and tablets: An exploratory study in Portugal. *Journal of Cleaner Production*, 156, 147-158. <https://doi.org/10.1016/j.jclepro.2017.04.039>
- Mayer, R. E. (2009). *Multimedia learning* (2nd ed.). Cambridge University.
- Mestres, E. T., & Pellicer-Sánchez, A. (2019). Young EFL learners' processing of multimodal input: Examining learners' eye movements. *System*, 80, 212-223. <https://doi.org/10.1016/j.system.2018.12.002>
- Miller, L. R. (1969). Eye movement latency as a function of age, stimulus uncertainty, and position in the visual field. *Perceptual and Motor Skills*, 28(2), 631-636. <https://doi.org/10.2466/pms.1969.28.2.631>
- Mitterer, H., & McQueen, J. M. (2009). Foreign subtitles help but native-language subtitles harm foreign speech perception. *PlosOne*, 4(11). Article e7785. <https://doi.org/10.1371/journal.pone.0007785>
- Montero Perez, M., Van Den Noortgate, W., & Desmet, P. (2013). Captioned video for L2 listening and vocabulary learning, A meta-analysis. *System*, 41(3), 720-739. <https://doi.org/10.1016/j.system.2013.07.013>
- Noar, S. M. (2006). A 10-year retrospective of research in health mass media campaigns: where do we go from here? *Journal of Health Communication*, 11(1), 21-42. <https://doi.org/10.1080/10810730500461059>
- Paek, H.-J., & Pan, Z. (2004). Spreading global consumerism: Effects of mass media and advertising on consumerist values in China. *Mass Communication & Society*, 7(4), 491-515. [https://doi.org/10.1207/s15327825mcs0704\\_7](https://doi.org/10.1207/s15327825mcs0704_7)
- Paivio, A. (1986). *Mental representations, A dual coding approach*. Oxford University.
- Perego, E., Del Missier, F., Porta, M., & Mosconi, M. (2010). The cognitive effectiveness of subtitle processing. *Media Psychology*, 13(3), 243-272. <https://doi.org/10.1080/15213269.2010.502873>
- Price, K. (1983). Closed-captioned TV, an untapped resource. *Massachusetts Association of Teachers of Speakers of Other Languages (MATESOL) Newsletter*, 12(2), 1/8.
- Rajendran, P., Rengarajan, T., Thangavel, J., Nishigaki, Y., Sakthisekaran, D., Sethi, G., & Nishigaki, I. (2013). The vascular endothelium and human diseases. *International Journal of Biological Sciences*, 9(10), 1057-1069. <https://doi.org/10.7150%2Fijbs.7502>
- Ravindran, N., & Myers, B. J. (2012). Cultural influences on perceptions of health, illness, and disability: A review and focus on autism. *Journal of Child and Family Studies*, 21, 311-319. <https://doi.org/10.1007/s10826-011-9477-9>

- Rayner, K. (1998). Eye movements in reading and information processing: 20 years of research. *Psychological Bulletin*, 124(3), 372-422. <https://psycnet.apa.org/doi/10.1037/0033-2909.124.3.372>
- Rayner, K., & Well, A. D. (1996). Effects of contextual constraint on eye movements in reading: A further examination. *Psychonomic Bulletin & Review*, 3(4), 504-509. <https://doi.org/10.3758/BF03214555>
- Roberts, L., & Siyanova-Chanturia, A. (2013). Using eye-tracking to investigate topics in L2 acquisition and L2 processing. *Studies in Second Language Acquisition*, 35(2), 213-235. <https://doi.org/10.1017/S0272263112000861>
- Robson, G. D. (2004). *The closed captioning handbook*. Elsevier.
- Romero-Fresco, P., & Pérez, J. M. (2015). Accuracy rate in live subtitling: The NER model. In R. B. Piñero & J. D. Cintas (Eds.), *Audiovisual translation in a global context* (pp. 28-50). Palgrave Macmillan.
- Specker, E. A. (2008). *L1/L2 eye movement reading of closed captioning: A multimodal analysis of multimodal use* [Doctoral dissertation, University of Arizona]. <https://www.proquest.com/openview/c93734f7b91765c93e411d72960effc3/1?pq-origsite=gscholar&cbl=18750>
- Szarkowska, A. (2011). Text-to-speech audio description: towards wider availability of AD. *The Journal of Specialised Translation*, 15, 142-162. [https://jostrans.soap2.ch/issue15/art\\_szarkowska.php](https://jostrans.soap2.ch/issue15/art_szarkowska.php)
- Szarkowska, A., Krejtz, I., Pilipczuk, O., Dutka, Ł., & Kruger, J. L. (2016). The effects of text editing and subtitle presentation rate on the comprehension and reading patterns of interlingual and intralingual subtitles among deaf, hard of hearing and hearing viewers. *Across Languages and Cultures*, 17(2), 183-204. <https://doi.org/10.1556/084.2016.17.2.3>
- Vanderplank, R. (2016). 'Effects of' and 'effects with' captions. How exactly does watching a TV programme with same-language subtitles make a difference to language learners? *Language Teaching*, 49(2), 235-250. <https://doi.org/10.1017/S0261444813000207>
- Wang, S., & Fu, R. (2020). Research on the influencing factors of the communication effect of TikTok short videos about intangible cultural heritage. In E. Markopoulos, R. Goonetilleke, A. Ho, & Y. Luximon (Eds.), *Advances in Creativity, Innovation, Entrepreneurship and Communication of Design: AHFE 2020* (pp. 275-282). Springer.
- Winke, P., Gass, S., & Sydorenko, T. (2010). The effects of captioning videos used for foreign language learning activities. *Language Learning & Technology*, 14(1), 65-86. <http://llt.msu.edu/vol14num1/winkegasssydorenko.pdf>
- Winke, P., Sydorenko, T., & Gass, S. (2013). Factors influencing the use of captions by foreign language learners, an eye-tracking study. *The Modern Language Journal*, 97(1), 254-275. <https://doi.org/10.1111/j.1540-4781.2013.01432.x>
- Woolley, G. (2010). Developing reading comprehension: Combining visual and verbal cognitive processes. *The Australian Journal of Language and Literacy*, 33(2), 108-125. <https://doi.org/10.1007/BF03651827>

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