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The American University in Cairo
School of Humanities and Social Sciences

**The Influence of Bolded Keywords in Online News Texts on Reading Speed
and Comprehension for Heritage+ Learners of Arabic**

A thesis submitted to
The Department of Applied Linguistics
In Partial Fulfillment of the Requirements for
The Degree of Master of Arts in
Teaching Arabic as a Foreign Language

By Marwah Khost AlJarkas

Under the supervision of Dr. Raghda El Essawi

June 2023

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Abstract

Learners and readers of Arabic, especially Heritage Language Learners, suffer more than ever from the lack of focus while reading online texts. This becomes a challenge that negatively impacts their overall learning process. This paper explores the influence of one salience feature - bolded keywords - over reading speed and comprehension amongst Heritage+ Learners of Arabic. Heritage+ refers to Arabs living in the Arab world, but who have minimum exposure to the language. Thirty-two students, who are Heritage+ Learners of Arabic, currently studying at the American University in Cairo and belong to Generation Z (18-25 years), participated in the study. Each participant was requested to read two articles; one text with bolded keywords and the other one without, followed by two multiple choice questions per article, and two open-ended questions. The study used a mixed approach to explore the influence on reading speed, comprehension, and individual preferences. Based on the non-parametric tests conducted to analyze the abnormally distributed data, there is no significant difference between the two text formats on reading speed and comprehension. However, it is clear from qualitative data gathered that participants prefer to read texts with bolded keywords for better comprehension, focus and engagement with text. Based on students' perceptions, bolding keywords can be amplified in pedagogical practices in language teaching classrooms to help maintain engagement with learning materials. However further research is needed to verify the effect of bolded keywords on reading speed and comprehension. Furthermore more research is recommended to explore this feature amongst other groups including foreign learners, Arabic native speakers and people with reading difficulties.

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Chapter 1: Introduction

Towards a more effective reading experience of online news in Arabic

The world is moving towards further connectivity and integration with the introduction of Web 3.0. This is a new phenomenon that refers to the latest technology solutions that aim to increase accessibility so that everyone can benefit from the massive world of digital opportunities. The increase of accessibility has led individuals to depend heavily on the internet to look for answers and to validate facts. In fact, 60% of Arab youth show clear interest in social media to stay up-to-date with the latest news (ASDA' A BCW, 2021). Reading online news on social media or through the official websites of the media outlets comes with a price. Internet users on average read less than 30% of words offered to them in an online text format (Nielsen, 2008).

People online practice hyper reading, which is a reading strategy that depends on reading fast in order to find the most prominent information in a text (Hawisher & Selfe, 1999). When people read with less focus, they become less exposed to complex ideas and to apply critical thinking skills and that leads to higher misinformation possibilities (Liu, 2012). People are also getting used to multitasking online as a result of reduced focus. This behaviour according to neuroscientists increases the cognitive load of the brain, making people focus less on in-depth texts and ignore important details (Carr, 2010). Mental health experts stated that multitasking has an alarming side effect on Generation Z particularly - individuals who were born after the year 2000 - exposing them to Acquired Attention Deficit Disorder (AADD), a condition that is known by making individuals less focused while doing a task throughout the day (Harmanto, 2013). Reading with speed, which is currently what most online news readers target, while encouraging higher levels of comprehension in order to increase reading benefits, have both become a challenge that all foreign language learners as well as teachers face when dealing with digital texts. Finding the

answer to this challenge may require resorting to research and experiments conducted in the field of foreign language teaching and learning.

About Heritage Language Learners (HLLs)

Learners of Arabic are all subject to face the different reading challenges explained earlier, and amongst them are Heritage Language Learners (HLLs). Despite numerous definitions of who HLLs are, one of the most relevant definitions to this study is one that defines them as individuals who speak the heritage language at home and do not use this language formally in the classroom (Valdés, 2001). Arabic HLLs may include Arabs living in a non-Arab country or individuals who are Arabs but have not been exposed much to the Arabic language or certain varieties of it, specifically modern standard Arabic (Mohamed, 2021). Reasons for this lack of exposure despite living in an Arab country is the newly established foreign-language based educational systems that focus on languages other than Arabic. This together with the diglossic/multiglossic situation in all Arab countries leads to a situation where the exposure and use of modern standard Arabic amongst some young people is reduced to a minimum, and that is followed by the inability to communicate using that variety. This group of individuals is referred to as ‘Heritage+’ learners of Arabic, as they sit between the native speakers and the typical heritage language learners (Mohamed, 2021). This subcategorization of HLLs has been mentioned in only one article by the researcher Dr. Yehia Mohamed, who is an associate professor at Georgetown University in Qatar. Heritage Language Learners in general and Heritage+ learners of Arabic in specific, who represent the main focus of this study, may face challenges while reading and writing if they have low exposure to MSA orally, and/or limited interaction with the written texts. Reduced reading skills is a major problem in that context, since

reading is an important source of input that this group needs in order to enhance their language skills.

The number of heritage learners in general and heritage learners of Arabic in specific is on the rise. Fairclough, 2016, claims that in the USA alone, the parentage of HL speakers has increased by 158.3% between 1980 and 2010 (Fairclough et al., 2016). In the last decade, the universe witnessed an increase of Arabs' migration due to political, geopolitical and economic circumstances in the Middle East and North Africa (MENA). With the increase of migration, minority languages have started to become more representative in classrooms, spoken by immigrants who have become HLLs living abroad (Abourehab & Azaz, 2020). Additionally, the number of Arabs who live in MENA, and may have not been part of an educational system that requires exposure to Arabic literacy skills, is also increasing. In Egypt for example, the number of international schools where the main language of education is a language other than Arabic and where Arabic is taught a maximum of 10 hours per week, increased by +1000% in the last decade (El-Gundy, 2021). This means, more individuals are exposed less to Arabic in formal education and are liable to fall under the subcategorization of Heritage+ learners. By targeting literacy problems this student population is facing, the outcomes of this study may be also applicable/meaningful when dealing with literacy problems of a larger group of individuals - including native and non-native speakers of Arabic. Salience features, which will be introduced in the following section, may be used to help enhance the reading experience online, and particularly increase focus while reading.

Salience and focus while reading

The concept of salience may present a part of the above-mentioned puzzle's solution, by helping Heritage+ learners of Arabic read more effectively. Salience in the context of this study

means making parts of the text more visible than others to attract attention and help guide the eyes to read more effectively (Gilreath, 1994). Researchers conducted earlier studies to explore the influence of salience features on readability and comprehension in relation to readers. Readability, a term that looks into both reading speed and fixation duration, is connected directly to shorter reading time (Just & Carpenter, 1980). Font size for example is amongst salience features that contribute to shorter reading time (Tullis et al., 1995), as well as line spacing feature (Kolars et al., 1981; Kruk & Muter, 1984; Rayner et al., 1981) when applied in English texts. Both features were found to be helpful to facilitate searching for a certain concept or idea within the text (Fisher & Tan, 1989; Xu et al., 2021). Comprehension, a term used to refer to a reader's understanding of a text semantically, is enhanced by techniques like underlying specific parts of the sentence; leading to higher comprehension rates according to earlier research conducted almost 20 years ago (Bishop & Snowling, 2004).

Highlighting keywords in bold is amongst the salience features that have also been researched. Keywords of a sentence represent the most relevant details of it (Sperber & Wilson, 2001). Studies (Doyon, 2022; Hartley, 2013; Kafle et al., 2019; Rello et al., 2014; Shaw, 1969; Xu et al., 2021) that assess the influence of bolded keywords over reading speed and comprehension remain in-conclusive, given the limited studies conducted and the audience targeted, covering mainly individuals with reading difficulties. A study by Rello et al. (2014) shows that bolding keywords contribute to higher comprehension scores amongst Spanish native speakers with dyslexia and a neutral effect amongst the control group of Spanish native speakers. Another one by Shaw (1969) targets a group of partially sighted children, and claims that reading performance increases slightly because of the use of bolded keywords. Furthermore, the majority of research was conducted in English, except for a limited number of studies. One of them is by Xu et al. in

2021, who claims that highlighting the text in bold makes it easier for readers to search for particular concepts in general or ideas (Xu et al., 2021). The variation in study results is also an issue where some studies show that salience has negative or no effect on reading speed and comprehension. For example, the study by Ganayim & Ibrahim (2013) concluded that the line spacing feature has a neutral effect on reading time and comprehension in Arabic texts amongst Arabic native speakers (Ganayim & Ibrahim, 2013). Additionally, the blue hyperlinked concepts in a text have no effect on comprehension amongst English native speakers (Gagl, 2016). However, the same salience feature in a different study encourages readers to re-read sentences with hyperlinked unfamiliar words and that may lead to higher comprehension (Fitzsimmons et al., 2019). As for the bolding feature, the study by Rello et al. in 2014 finds a neutral effect on reading speed in Spanish texts amongst Spanish native speakers with dyslexia and also amongst the control group of native Spanish speakers (Rello et al., 2014).

In light of the above lack of consensus on the effectiveness of using salience to enhance reading speed and comprehension, this current study aims to explore the influence of one of the salience features, bolding feature, over reading speed and comprehension amongst Heritage+ learners of Arabic; following and modifying the Rello et al. (2014) study research design. This research is necessary now more than ever to help learners enhance focus during reading online texts on the internet. By relying on salience techniques that have been used in the field of teaching reading to dyslexic learners, visually impaired as well as limited control groups, the study contributes to research done in the field of teaching Heritage Learners in general and Heritage+ learners in specific, as well as that pertaining to the effect of using salience techniques to enhance linguistic benefit of language exposure via reading.

1.1. Research Questions & Hypotheses

The current study aims to answer three questions that relate to reading speed and comprehension;

- Do bolded keywords in online news texts in Arabic affect reading speed for Heritage+ Learners of Arabic?
- To what extent does bolding of keywords in online news texts in Arabic affect reading comprehension for Heritage+ Learners of Arabic?
- What are heritage learners' perception of reading online texts with bolded keywords?

There are three hypotheses formed for this research paper. These were formed based on the results of previous studies (Bishop & Snowling, 2004; Kafle et al., 2019; Kolers et al., 1981; Kruk & Muter, 1984; Rayner et al., 1981; Rello et al., 2014; Tullis et al., 1995; Xu et al., 2021) that show the positive influence of salience features on reading speed and comprehension. Additionally, these hypotheses were also formed based on observations of Arabic as a Foreign Language (AFL) teachers, who use salience features in classroom activities and assignments to help facilitate reading comprehension in relation to language learners.

- H.1: Bolding keywords in online news texts helps Heritage+ Learners of Arabic read faster.
- H.2: Bolding keywords in online news amongst Heritage+ Learners of Arabic focus more while reading online texts and that leads to better comprehension scores.
- H.3: Heritage+ Learners of Arabic prefer to read texts with bolded keywords.

1.2. Definition of Terms (in alphabetical order)

- **Comprehension** is a term that refers to readers' understanding of a text. In this study, comprehension measures readers' correct answers in regards to specific information found in the text.

- **Heritage+** is a subcategorization of HLLs referring to those live in the Arab world according to the researcher Yehia Mohamed in 2021, and have been exposed to a minimum level of MSA due to their enrollment in non-Arabic curriculum-based schools.
- **Heritage Language Learners (HLLs)** is a concept that is usually defined as individuals who were raised at home where a heritage language is spoken. They may also speak or barely acknowledge this language and are somehow considered bilinguals (Valdés, 2001).
- **Keywords** are words that represent the most relevant words or phrases of a sentence (Sperber & Wilson, 2001). In other words, keywords represent the major focus of a sentence, and reflect the most significant semantic meaning.
- **Readability** is a term that measures the reading performance of individuals. It is measured by looking at both reading speed and fixation duration (Just & Carpenter, 1980). The fixation duration is measured using eye-tracking equipment, and given that equipment was not included in this study, this term is not being used throughout the paper.
- **Reading speed** refers to the period of time needed to complete a specific given text. This is usually performed either through silent or loud reading. Reading speed can be measured with a tracking system of clock watch.

Chapter 2: Literature Review

Since the goal of this study is to explore the influence of bolded keywords over reading speed and comprehension amongst Heritage+ learners of Arabic, this chapter is dedicated to shed light on previous research conducted to explore that association. This review of literature is divided into four main themes and sub-themes including; online reading strategies and changing behaviors, Heritage Language Learners of Arabic and their challenges with reading, and finally the concept

of Salience along with previous studies on the influence of different features on reading speed and comprehension.

2.1. The different reading strategies and the continuous changing behaviors

2.1.1. Reading online texts and the challenges they pose

The process of reading a text differs based on the objective of reading. Serial reading is the process of reading from the start till the end of a text without skipping any part of the material, and is usually applied subconsciously when reading content for in-depth learning or knowledge. Selective reading on the other hand is applied when a person is searching for a particular part of the text or sentence, or wants to scan for specific information (Gilreath, 1994). Access to many online materials at once introduced a new phenomenon of reading called Hyper Reading which is similar to selective reading. The only difference is that hyper reading is majorly driven by the fact users of the internet want to save their attention time as much as possible and hence, prefer to read in order to identify the most important details of the text (Baron, 2017). Researchers also found that people read online texts following the shape of the 'F' letter. This means that people start to read the first few lines of the text and then their focus will start to decrease throughout the remaining text. Their eyes then move directly towards the right-bottom side of the article to finish reading (Hayles, 2016). The research conducted by Hayles was tested using an eye-movement tracking method to detect the focus of the eye, and on which parts of the text. This same pattern of eye-movement is applicable for readers of the Arabic language, where the actual shape of the 'F' letter is flipped to the other side (Pernice, 2017). With online reading, individuals have access to different sources of content at the same time and across different platforms and also devices. This is why people online read for a specific purpose that keeps changing continuously. They read either for entertainment and to reduce boredom, or to stay up-to-date with what is going on in the world

or in a specific industry or sector, or to look up a certain answer or a task (Britt et al., 2019). It is important to mention that both reading approaches; selective reading and hyper reading, have significant benefits and combining them may lead to greater outcomes (Hayles, 2016). However, as digital transformation continues to rise, it is expected that hyper reading will become the dominating approach of reading at the expense of other reading strategies, unless people spend more time combining both approaches consciously through their reading pattern and behavior overall (Baron, 2017).

2.1.2. The impact of digital transformation on reading outcomes

The change of lifestyle over the years, starting with the introduction of the internet in the 1980s, has had its significant impact over digitalizing the human's brain and thinking process. In fact, a study by Microsoft Corp. surveyed 2,000 participants and tracked the brain activity of 112 other participants (Microsoft, 2015). The results show that users of the internet usually lose concentration or focus of the content they are exposed to after an average of eight seconds or less. This amount of time has dropped by four seconds since the 2000s and the revolution of the internet. During these eight seconds or less, users decide to either continue scrolling over a specific article or website or move on for other options. To continue the discussion on focus, Dr. Gloria Mark, who is a cognitive psychologist, conducted many studies including studies in 2014, 2015 & 2016, along with other researchers to track the average amount of time a human being requires to shift focus from a task to another, or from a type of content to another. On average, the studies show a total of 47 seconds spent where an individual is actually in a focus mode while exploring an article or a website (Mark, 2023). Based on these figures, social media platforms are moving their focus and dedication to shorter content that does not bypass the sixty seconds, and preferably less than thirty seconds.

Online reading thus encourages behavior of skimming through different types of content and that is usually fragmented and disconnected (Hillesund, 2010). This behavior leads to individuals reading texts in a shallow manner without getting into details or critical thinking (Liu, 2012). The phenomenon of shifting focus is often referred to as ‘multitasking’ in the corporate world. According to neuroscientists, this behavior increases the cognitive load of the brain so it becomes harder to differentiate between what is relevant and what is less or not relevant (Carr, 2010). This may also lead to focusing less on longer texts during reading online and increasing the tendency of neglecting important information (Carr, 2010).

Some researchers suggest that offline reading may be more helpful compared to online reading as distractions are reduced. A study by Mangen et al. in 2013 claimed that students who read texts in English in a print format have higher reading comprehension scores compared to those reading online texts (Mangen et al., 2013). However, another study involving 66 university students in the United States, found no significant differences in the comprehension competence between print or digital reading across mediums like digital books or audiobooks (Moyer, 2012). Aside from comprehension scores, research conducted by Baron in 2017 confirmed that participants tend to dedicate less time for reading online articles versus printed articles (Baron, 2017). Thus, Baron’s research confirms the fact that people lose focus when reading online articles as discussed earlier.

Many media publications today compete for the attention of their readers as they fight for a sustained profitable business. Media publications are jumping on the wave of multitasking or what is called “the state of continuous partial attention” (Jones & Hafner, 2012: pg 82). With people’s disrupted attention online, it becomes common to read headlines only and skip the entire article, especially if presented on social media. This leaves readers with more restrictions to apply

critical thinking and evaluate whether what was read is enough to draw conclusions or not (Britt et al., 2019). Although the issue of multi-tasking targets everyone that has access to the internet, it is truly important in the case of Generation Z, which covers individuals born after the year 2000, as the internet became a global medium of connectivity and access, and a sole source for the majority of acquiring and communicating information (Bilonozhko & Syzenko, 2020).

2.2. On Generation Z (Gen Z) and their reading behavior and strategies online

People who are part of Gen Z are labeled as digital natives or digital savvy as they were born in the period of accessible connection. Many studies were conducted to analyze common characteristics of Gen Z. On average, a Gen Z person has an attention span - focusing on a subject or activity - of eight seconds only, which is four seconds less than the average period for millennials (Erwin & Shatto, 2016). According to previous research, Gen Z students tend to pay less attention to details, and they care less about verifying information they get exposed to while reading online (Bilonozhko & Syzenko, 2020). As Gen Z individuals are used to multitasking online and shifting gears at all times, they always ask for a speedy delivery of information - which is usually short in length (Harmanto, 2013). According to mental health experts, this phenomenon of multitasking makes Gen Z more vulnerable to losing focus or diagnose with Acquired Attention Deficit Disorder (AADD). The symptoms of AADD include the lack of focus especially when an individual is exposed to long or complex content that require critical thinking or analysis relevant skills (Harmanto, 2013). As deeply processed input is necessary for second language learning (Krashen, 1992), the phenomenon of multitasking may negatively impact foreign language learning. In order to help Gen Z focus while reading online, researchers believe that using authentic reading materials may increase motivation amongst learners, especially if the content is also short and of interest to the readers (Bilonozhko & Syzenko, 2020). The motivation resulting from

content of interest helps Gen Z learners read the full text and comprehend better accordingly. The researchers also recommended to encourage Gen Z learners to self-discover their own reading materials online as that will increase both motivation and engagement (Bilonozhko & Syzenko, 2020). Knowing that online reading is an indispensable form of communication in today's world and one which many teachers target for development in foreign language classes, it becomes clear why the referenced issues may contribute to reducing the benefits Gen Z learners gain from online reading training. However, there may be an added layer of challenge towards individuals who are not native speakers including Heritage Language Learners.

2.3. On Heritage Language Learners (HLLs) and their challenges in reading Arabic texts

There is no one definite definition of HLLs given their variation in terms of proficiency level, heritage connection among other factors including political and social reasons. A researcher called, Van Deusen-Scholl, distinguished those who speak the Heritage Language (without specifying the level of proficiency) and others who want to learn the heritage language just to connect with their heritage culture (Van Deusen-Scholl, 2003). In this research study, the concept of Heritage Language Learners has been referenced based on the definition presented by the researcher Yehia Mohamed in 2021 in a blogpost, where he claimed that HLLs of Arabic are not limited to those living outside MENA, but also those who live inside those Arab countries (where the targeted language is spoken) (Mohamed, 2021). The difference here is that certain varieties of their language are minimally spoken or used in formal education as students tend to study in international based schools. Instead, English - amongst other languages - is the main language of instruction which could lead to Arabic literacy problems in some cases. This category of students is referred to as 'Heritage+', according to Mohamed (2021). This group of individuals sits between the native speakers and the typical heritage language learners. The 'Heritage+' subcategorization

of HLLs has not been fully researched aside from the brief blogpost by the researcher Yehia Mohamed from Georgetown University where he introduces this new subcategorization of HLLs. The above reveals discussion that HLLs indeed represent a variety of backgrounds and proficiency levels. They all, however, have one main thing in common and that is they have an incomplete acquisition of the heritage language covering morphology, syntax, semantics and sometimes phonology (Albirini et al., 2011).

Amongst the challenges that contribute to the Heritage+ learners' literacy predicament is the phenomenon of 'diglossia' or the existence of Modern Standard Arabic (MSA) and Colloquial Arabic (CA) (Albirini & Benmamoun, 2022). In the Arab world, MSA is the official language used in written communication and official documentations, whereas the colloquial Arabic is the variety of spoken dialects across MENA. Both MSA and colloquial Arabic have their distinct linguistic features and they sometimes overlap (Albirini & Benmamoun, 2022). The phenomenon of diglossia in Arabic is considered by some as a potential cause to reduced levels of reading comprehension (Kweider, 2014). Many HLLs of Arabic get exposed to the colloquial Arabic language of their parents or extended family at home, however they are less exposed to MSA unless caught via broadcasted news or religious books like the Holy Quran (which they may not fully understand) (Hillman, 2019). This leaves individuals with a variation in the proficiency level of their oral knowledge of the colloquial Arabic spoken with their families and sometimes friends (if they live in the Arab world), and their inventory of MSA used mainly for writing and reading, favoring the former (Saiegh-Haddad, 2003).

According to research conducted by Montrul (2012), the linguistic spoken abilities of certain groups of HLLs can be compared with native speakers, but their literacy levels (reading and writing in MSA) can in some cases only be compared with second language learners (S. A.

Montrul, 2012). This is due to the fact that the Modern Standard Arabic (MSA) is not dominant and not being practiced regularly, and hence, results in a situation of incomplete language acquisition of this variety. This makes HLLs have better aural skills compared to skills in relation to writing and reading, or in this case, MSA (S. Montrul, 2013). This is especially true in the case of Heritage+ learners of Arabic who get exposed to a lower volume of necessary vocabulary in MSA as well as the basic syntactic structures. Both combined may affect the overall reading comprehension (Abu-Rabia, 2000). All the above results in a situation where HLLs in Arabic and specifically Heritage+ learners (who represent the main focus of this study) face issues with decoding the language, or in other words, need more processing time to read in MSA. Researchers believe that bottom-up decoding skills are also impacted (Saiegh-Haddad, 2003). This is why it is important to expose HLLs of Arabic to MSA outside the classroom - as when they practice their day-to-day activities and not to fulfill an assignment or test for their class - and that can be done gradually to improve their vocabulary inventory and the ability to decode reading input. Heritage Language Learners can potentially lose their heritage language if it is not practiced at home or with the surrounding community, or in the cases of limited exposure to materials in MSA, whether in written or audible format (Merino, 1983). Even if the heritage language is not completely lost, there is a threat of it becoming less dominant compared to the L2 language which learners get exposed to from a young age (Albirini & Benmamoun, 2022).

One way to increase HLLs exposure to MSA is through reading, especially reading online texts (these being highly available and being representative of modes of reading that HLLs of Gen Z are most familiar with). However, the learning benefit of such material is negatively affected by problems of lack of focus during reading as discussed above. It is therefore very important that techniques are developed to increase focus level of HLLs in general and Heritage+ learners in

specific during reading online (the reading mode of today that they mostly do and will rely on in the future) to enhance comprehension and so enhance linguistic benefits. In order to combat such challenges, and encourage people to avoid surfaced reading, the final section of this chapter explores how salience features may represent a solution to online distractions while reading, and encourage further focus down the line.

2.4. The influence of salience features on reading; via previous research

2.4.1. The different salience features including font size, highlighting and color

With a huge load of information online, the human's brain is sometimes stimulated by specific techniques or features to read in a particular way. The concept of 'salience' as an example, makes parts of a text more visible thus draws readers' attention to them. This can be achieved by putting the text into a visible position in the page or by presenting typographic hints (Gilreath, 1994). Salience features may include font size, color, boldface highlighting amongst others. In the past, salience has been widely applied for specific categories of content including warnings for example to make them more noticeable (Young & Wogalter, 1990). Salience however could also be a deterrent if different forms of it are congested in the same text. Having them presented that way may lead readers to difficulties in processing the language of the text (Hartley, 2013). For example, it would be cognitively overloading for readers to see one part of the text highlighted in yellow, whereas another part is bolded, and a third part is written in a bigger font size. To the mentioned researcher, the application of salience features needs to be explained to readers in order to facilitate reading, otherwise, no significant impact happens (Hartley, 2013).

Font size is amongst the early investigated salience features, and its correlation with reading speed. Two studies conducted in English confirm a positive correlation between bigger font size and reading speed (Bernard et al., 2003; Tullis et al., 1995). In addition to font size,

underlining specific parts of the sentence is considered a salience feature. Another study conducted in English using a small-sized sample shows that formulaic sequences that are underlined receive higher attention from readers who are keen to understand the meaning of that lexical phrase; leading to higher comprehension overall (Bishop & Snowling, 2004). The researchers, Fisher & Tan in 1998, investigated the effect of font color on searching behavior, and the study concluded the positive influence of font color on identifying highlighted words or parts of a sentence more easily (Fisher & Tan, 1989). Spacing is yet another salience feature that has been explored by researchers. An experiment conducted in English claimed that participants read texts with margins in a longer time, and their comprehension is lower compared to the original text (Chaparro et al., 2004). Another study was conducted to assess the impact of double spacing between sentences in a text written in Arabic over both reading speed and comprehension (Ganayim & Ibrahim, 2013). The study concluded that line spacing has a neutral effect on reading time and comprehension score. However, when a similar study was conducted in English, participants were reading faster as the number of total fixations were less compared to a normal presented text (Kolars et al., 1981; Kruk & Muter, 1984; Rayner et al., 1981).

Salience features also include highlighting words or full-sentences in texts to make them stand-out. When parts of the text are highlighted, whether through a change of color, size, typographic thickness or others, they stand-out compared to near-by text that does not have the same features and that reduces the information load on readers or receivers of targeted texts (Hartley, 2013). In 2016, a researcher called Benjamin Gagl, explored the impact of another salience feature; blue hypertext for target words (Gagl, 2016). This phenomenon is often found in articles where specific keywords get linked to other previously published articles to strengthen the page's SEO (search engine optimization) score of the meant publisher. Forty German speaking

students read two texts silently; one with target words with blue hypertext, and the other text with original font color (default black). The study found that there is no impact of color nor underline feature on reading speed during the first round. However, the fixation time of the participants' eyes on targeted words increased in their re-reading round (Gagl, 2016). Additionally, their comprehension score, when presented with questions after their reading round was over, was completely the same in both circumstances (Gagl, 2016). Another research was conducted to assess that same salience feature, but this time, the results showed that readers have the tendency to re-read sentences where unfamiliar words to them are hyperlinked compared to other sentences with hyperlinked familiar words (Fitzsimmons et al., 2019). The same group of researchers published another research the following year where they concluded that readers have a higher possibility to process hyperlinked words lexically if they are skimming a text compared to normally presented words (Fitzsimmons et al., 2020). This proves again how salience features may increase learners' focus overall. Another salience feature, which also falls under the concept of highlighting words, is the bolding of specific words or full-sentences. According to a study conducted on reading texts in Chinese, the researcher found that highlighting the text in bold makes it easier for readers to search for particular concepts or ideas (Xu et al., 2021).

Researchers were also interested in exploring the different dimensions of salience in order to help solve challenges individuals face due to their reading difficulties and/or disabilities. A study in 2014 investigated the influence of bolding keywords in a sentence in Spanish on reading speed and comprehension for Spanish native speakers with and without dyslexia (Rello et al., 2014). The study was conducted on 62 Spanish speaking participants; 31 of which were diagnosed with Dyslexia. The age of participants ranged between 13 to 40, covering more than one generation. Each participant was requested to read two texts; one with bolded keywords,

whereas the other one without bolded keywords. The study aimed to measure readability by looking at the reading speed as well as the fixation duration. The second measurement was related to participants' overall comprehension to the text, which was measured by multiple choice questions. The study found that the text presented with highlighted main ideas drive higher comprehension scores for people with dyslexia compared to readers who are not diagnosed with dyslexia. As for reading speed, the study showed no major positive correlation between highlighting words in bold and reading speed, among the group of people with dyslexia versus people without dyslexia who have shown a slight increase in speed. In another study, highlighting words in boldface made it easier for deaf individuals to read video captions and follow different video content, according to a study conducted by Kafle et al. in 2019. Another research in 1969 studied the influence of typeface weight (which references boldfaced text) over reading performance amongst two groups; the first group includes partially sighted children, and the other one includes fully sighted children. The study showed that the bolded text contributes to the increase of reading performance by 9% amongst the group with partially sighted children, and 16% increase achieved by the change of font size (Shaw, 1969). Priestly, on the other hand, suggests applying the bolded type feature on single words instead of longer phrases or full-on sentences, as the latter may lead to lower readability rates (Priestly, 1991). The research done by Hartley (2013) suggests that salience features especially in relation to color or bolding typography may lead some individuals to feel confused while reading (Hartley, 2013). In other words, they may feel that they are cognitively overloaded due to seeing a crowded text with many visual pop-ups. This same insight was also mentioned in a study about the influence of colored words on reading behavior. The results confirmed that coloring only one single word in a sentence may lead to lower skipping rates compared to reading more colored words at once, and

that is associated once again with visual load (Fitzsimmons et al., 2019). Though some of the above-mentioned research deals with groups other than HLLs (so may not have a direct impact on the group that current study addresses), they do provide examples of how bolding is used and its expected effect.

Bolded terms as a pedagogical feature is a common treatment of texts. According to research conducted in 2003 to evaluate the preference of English-speaking students when it comes to salience features used in introductory textbooks in psychology, students ranked the boldface feature the lowest in terms of usefulness or helpfulness in their learning process, compared to other features such as italicized terms with a slightly higher percentage (Hartley, 2013). It is common however to see teachers, whether they teach languages or other subjects, use bolded typeface features to represent main items and help learners absorb those conceptually. Despite the above, the research about highlighted keywords in educational texts is very limited, according to this literature review. The above studies cannot conclude the potential influence of such salience features over reading performance, even more so in relation to reading Arabic texts.

2.4.2. Salience features in media

Media outlets have been using the concept of salience in their visually oriented news stories on social media channels, but without a set criterion for applying the feature on texts. An example of these outlets is Al Jazeera, a Pan-Arab media outlet based out of Qatar. On Instagram, the official channel of Al Jazeera - [aljazeera@](#) - breaks the latest regional and global news through still posts and short videos. On both formats, the editorial team responsible for the Instagram channel applies various salience techniques to attract readers and grasp their attention, in a world where many outlets are competing for the same purpose. The Head of Communications at Al Jazeera's Sanad Fact-Checking Agency, which operates under Al Jazeera Media Network, Dr.

Khaled Attia, explained on January 31st, 2023 over a written interview conducted by the researcher on WhatsApp, the different tactics used and the purpose based on the media network understanding. According to him, the team at Al Jazeera uses different types of salience techniques to help influence the reader's journey and deliver the critical information in a short span of time without going into secondary details. The first format includes the highlighting of headlines on still posts or video stories, in order to grasp people's attention on web and mobile. The headline is usually short, and the longer headline with details is added in the caption. The team sometimes for example changes the font color of the country where a specific event happens or the source if it is critical for the readers (K. Attia, personal communication, January 31, 2023). The second format which is more common is the use of the yellow highlight color for critical phrases or words shown in still or video content. According to Al Jazeera, the highlights (in yellow) are applied to differentiate important components of the long video script so the user reads more efficiently and quickly. This technique may help readers remain engaged throughout the video instead of getting bored while following the content in a serial format on social media (K. Attia, personal communication, January 31, 2023). Based on the interview with Al Jazeera's representative, it is important to mention however that there is no clear criterion that helps editorial teams, and especially those responsible for digital content on social media platforms, identify which words from a text need to be changed (via a salience feature) or not.

2.4.3. The concept of 'Bionic Reading' and its effect on reading outcomes

In 2016, a Swedish typographer named Renato Casutt invented a specific boldface highlighting technique called 'Bionic Reading'. This technique refers to highlighting the most succinct part of a word within a sentence. According to Casutt, this technique guides the reader's eyes by focusing on particular elements of words and allows the brain to remember the rest of it;

and this leads to a faster reading process (Casutt, 2016). This technique has been applied through a customized Chrome extension for use in English texts. By activating this extension, the first part of each word (whether one, two or three or four first letters) will be highlighted in bold. The founder, Casutt, claims on his company's website that this approach made it easier for readers to read concisely, and with higher attention. A study was conducted in 2022 to validate the benefits of bionic reading (Doyon, 2022). The study included a sample of 2,000 random internet users who were timed when reading a text using bionic reading technique, and another one without it. The study concluded that bionic reading does not influence reading speed, but in fact, makes readers read at a slower pace. The conducted study comes with some limitations; one of which is related to the fact the sample is random and comes from different backgrounds which violates consistency. This is why this study requires further research to confirm the conclusions. Thus, Bionic reading remains a potential hypothetical solution that relies on the concept of saliency that aids the online reading community.

In conclusion, as previously conducted studies about the impact of salience features are either niche in their scope (targeting individuals with reading difficulties, and majorly in English) or published long time ago, there is room to study the effect of salience features in relation to enhancing reading speed and comprehension for Arabic speakers, and especially Heritage+ Language Learners who face multiple challenges as explained earlier.

Chapter 3: Methodology & Study Procedures

This chapter introduces the methodological approach, study design, and materials that targets exploring the influence of highlighting keywords in bold on Heritage+ Learners of Arabic reading, thus answering the following research questions;

- Do bolded keywords in online news texts in Arabic affect reading speed for Heritage+ Learners of Arabic?
- To what extent does bolding of keywords in online news texts in Arabic affect reading comprehension for Heritage+ Learners of Arabic?
- To what extent do Heritage+ Learners of Arabic prefer to read texts with bolded keywords in online news texts?

3.1. Methodological Approach

In order to study the influence of bolded keywords on reading speed and comprehension of online news texts in Arabic amongst a targeted group of Heritage+ Learners of Arabic, this research will apply both quantitative and qualitative methodological approaches. The quantitative method, which is adopted from Rello et al. study (2014) will examine the impact of bolded keywords on reading speed and comprehension by measuring the reading speed of participants and tracking their comprehension scores, while the qualitative method complements the quantitative results by providing in-depth understanding of the preferences and challenges readers face when using this technique. This is important because the latter type of information is not likely to be reflected in numerical measures related to speed or comprehension scores. The qualitative part will also highlight the potential limitations of the study and provide a clearer path of future research. Having mixed methods research features a more inclusive outlook of the study outcomes, considering not only the numerical findings but also the subjective thoughts of participants (Johnson & Onwuegbuzie, 2004).

The study looks into the following variables: the one independent variable is the boldface highlighting of keywords in the sentence and the two dependent variables are reading time and

comprehension score. Each student's reading speed and comprehension were measured when using treatment and when not using it. The comparison of performance in both cases to detect the progress caused by the treatment (or lack of it) was done at the individual student level (i.e. each student's speed and comprehension when using treatment were compared to the same student's results without treatment). This format of data gathering leads to elimination of variation in proficiency levels among study participants as a factor that could influence study results.

3. 2. Materials

Since the study is focusing on enhancing reading of media online texts, the reading experiment relied upon two news items, taken originally from BBC Arabic. BBC Arabic is the official source from the Middle East & North Africa, populated in the Arabic language. The website was launched in 2008, and is managed by a team of editors around the MENA region and around the world. This website was chosen for this experiment as it covers mainstream news, which is the target content of this research. The choice of articles depended on a few factors to ensure consistency in potential level of difficulty between the selected texts: a) equivalent number of word count, b) similar level of reading complexity (including unfamiliar concepts or complex words) and c) similar subtopic or genre. The chosen articles were both written in Modern Standard Arabic, as the rest of the featured articles on BBC.com/Arabic site. Both articles covered a timely theme when the experiment was conducted; the recent earthquake which hit both Syria and Turkey earlier this year - March, 2023. It must be mentioned however that although the two articles chosen were written about the earthquake, they were written by two different authors and with two different sub-themes. It was important to keep both articles under the same thematic umbrella to consider compatibility requirements and avoid external factors. As the topic chosen was about the earthquake, the variation in students' familiarity with the topic was not considered an issue. This

is because the unfortunate earthquake disaster in Syria and Turkey was well-known amongst everyone, aside from the students' proficiency level. The identified two articles were slightly adjusted for the experiment; both of them were cropped by the researcher in order to fit a total number of 216-217 words and the headlines were also removed, because the research looks into long texts and not concise headlines. Both articles had around a similar number of bolded keywords; 83-86 with font size 12px. The validated texts were presented in a total of four renditions to guarantee random distribution (some students read first the text with bolded keywords, whereas others start with the text of unbolded keywords). Three judges/experts in the field of Arabic Foreign Language teaching and learning at the American University in Cairo were consulted to validate the criteria for choosing the texts and respective questions. Dr. Shahira Yacout is Senior II Language Instructor, and has a master's degree in TAFL from AUC and a PhD from Ain Shams University with over 20 years of experience. Second, Ms. Azza Hassanein, who is a Senior II Language Instructor, at AUC with over 20 years of experience. Third, Dr. Raghda El Essawi with a PhD from Al-Azhar University, a master's degree in TAFL, and is currently an associate professor at the Department of Applied Linguistics.

3.2.1. Keywords and Key Phrase Identification

In studies performed using languages other than Arabic, keywords did not consider certain structures like subordinate and relative clauses as key to comprehension of main ideas in a text (Rello et al., 2014). In Arabic, the situation is a bit more complex. The prepositions themselves and the words that follow the prepositions (الأسماء المجرورة) may mirror an important aspect of the sentence, semantically, and thus cannot be excluded (Husni & Zaher, 2020). An example is this sentence (تعمل اليونيسف على إيصال المساعدات), extracted from one of the texts used for this study. The phrase that follows the preposition is essential to understand the text and what that sentence means.

This is why a criterion was created for bolded vs unbolded words in this reading experiment in Arabic, and was reviewed, discussed, and approved by the previously mentioned judges/experts. Since a higher level of consensus was detected on criteria for unbolded words, it was decided to mainly rely on this criterion placing all words that do not fit under them in bold. The criteria for choosing unbolded words are:

1. Functional words including prepositions, conjunctions, adverbs of place and time
2. Adjectives (single or multi-phrase adjective)
3. Relative clauses
4. Verbs that do not add additional meaning and are often used in news contexts
5. Nouns that follow the prepositions and the possessors that present a syntactic structure only without holding an essential semantic meaning in the sentence
6. Phrases that are added in news contexts as connectors between sentences

1. الكلمات الوظيفية (وتشمل أحرف الجر، وحروف العطف، وظروف الزمان والمكان) فيما عدا ما اتصل

بالأفعال المتعدية بحرف جر

2. الصفات بما فيها الكلمات المفردة أو المركبة

3. الجمل التي تصف حدثاً ما أو شيء ما في الجملة، وإزالتها لا تضرّ بالمعنى الرئيسي

4. الأفعال التي لا تضيف معنى للجملة مثل يعد، وتمّ وغيرها - مستخدمة بكثرة في نصوص الأخبار

5. الأسماء المجرورة أو المضاف إليه الذي إن حذف قد يضرّ بالتركيب النحوي فقط وليس بالمعنى

الموجود في الجملة

6. الجمل التي توضع في النصوص الإخبارية للربط بين الفقرات

(The two texts with a detailed application of criteria and the rationale for application explained are added into the appendices section - page 67 & page 71).

The three field experts also approved how the above criteria is applied on the two texts presented in the reading experiment in order to avoid any subjective biases from the researcher. The researcher first applied the criteria to the two selected texts and shared the materials with the experts to assess if other words need to be unbolded or not. Below is an example of a short text.

يعد **تأثير الزلزال** على **الأطفال والأسر** في **المنطقة** كارثيًا حيث **ترك مئات الآلاف** من الأشخاص في **ظروف بائسة**. لقد **فقدت** العديد من **العائلات منازلها** و**تعيش** الآن في **ملاجئ مؤقتة**، غالبًا في **ظروف شديدة البرودة** حيث يؤدي تساقط الثلوج والأمطار إلى تفاقم معاناتهم. وألحق **الزلزال أضرارًا** واسعة النطاق **بالمدارس** وغيرها من **البنى التحتية**، كما بات **الحصول على المياه الصالحة للشرب والصرف الصحي مصدر قلق** كبير، وذلك بالإضافة إلى **الاحتياجات الصحية** للسكان المتضررين.

Figure 1: Two paragraphs from Text A with bolded keywords

3.2.2. Comprehension Test

Following each presented text, there were two multiple-choice questions to evaluate whether the readers focus on information included within the texts or not. The format of the questions used in this study (multiple-choice Qs) was also used in (Rello et al., 2014) as a way to measure the participants' understanding of the online text. The questions were curated individually by the researcher, reviewed and approved by the study judges. The four questions added in the experiment address specific information presented in the text, and that is a limitation of this research as it does not assess the indirect overall comprehension of the text, but rather focus on specific parts (as will be discussed in more details under section 5.4).

3.2.3. Additional Questions & Interviews

At the end of each reading experiment, there are two open-ended questions for all participants to get their personal preferences and challenges they may have faced during the

experiment. All participants ended up writing the answers in English as it was easier and faster for them to express ideas and thoughts into a written format, given their competence levels in Arabic.

- (English) Which text did you prefer to read more & why? (With bolded words or without bolded words)

• أي نص تفضل قراءته برأيك ولماذا؟ (مع الكلمات السميكة أو بدون الكلمات السميكة)

- (English) Did you note a change in ‘focus’/ ‘level of focus’ while reading the two texts? Which was better?

• هل لاحظت تغييراً في التركيز خلال قراءة النصين؟ أيهما أفضل؟

The objective was to get their subjective opinion towards the application of bolded keywords, whether it is useful or not, and understand their preference. The first question is used to quantify the participants’ preference and also get their insights on the ‘why’ for a qualitative analysis. The second question encourages participants to provide additional insights on whether the bolded keywords have any influence on their focus or not. A group of five out of 32 students were also interviewed post the experiment, in order to get more in-depth insights to their overall experience. Each interview lasted for almost five minutes, and manual notes were taken by the researchers in order to complement the findings of the experiment. Only five participants were involved in the interview process for convenience purposes, and the interviews were conducted right after the experiment given how challenging it might have been to contact the participants after analyzing the quantitative sections of the study (which was after finishing the university semester). The interviews followed the unstructured format where students had the opportunity to explain further their preference and challenges they may have faced throughout the experiment.

3.2.4. Equipment

Readability as mentioned earlier includes both reading speed and fixation duration. The research methodology was meant to include an eye tracking equipment to assess the exact fixation rates throughout the experiment. Given that AUC (where experiment was taking place), did not possess necessary equipment, fixation rate was excluded. It will be added however as an aspect that needs to be inspected in the section about future research. The study instead relied on a manual time tracker to determine the reading speed for each participant. A total of 10 manual timers were purchased from Amazon.com in order to accurately measure the reading time.

3.3. Study Participants

The study was conducted with the help of 32 undergraduate students, who are Heritage+ learners of Arabic studying at the American University in Cairo. Their age ranges from 18-25 years. All participants were capable of reading long-form articles in MSA - with different competence levels. Participants were asked to sign a consent form in Arabic before proceeding with the experiment [added in the appendices section, page 77]. The objective of the form is to protect the privacy of participants, as their personal details remain anonymous. Around half of the total participants (15 students) are Heritage+ Learners of Arabic, enrolled in classes for Heritage Learners at AUC. The remaining participants were identified through an AUC community-oriented Facebook Group - called Rate AUC Professors - for currently enrolled undergraduate and graduate students at AUC, and who also fit under the definition of Heritage+ learners as indicated in this study. The criteria that define the sample was stated clearly on Facebook to encourage recruitment; “If you are Egyptian national and have studied in international schools (or non-Arabic curriculum-based schools) in Egypt before joining AUC, and can read texts in Arabic, then you will be a great support for the study.” These students shared the same features as the main group, as both of them were Egyptians, enrolled in international schools (where Arabic is not the primary

language for teacher) and have been living in Egypt for a long period, but have literacy difficulties when it comes to MSA. The experiments were conducted individually at the university's library - first floor - with each participant.

3.4. Study Procedures

Step 1: Preparing the materials for testing

In the experiment, students are exposed to two texts, one with bolded keywords and the other one without bolded keywords. Each text includes 5 paragraphs, so each student reads a total of 10 paragraphs. The texts are offered in a random order to avoid any biased results towards a specific sequence of variables. This means some participants receive the boldface highlighted text first, whereas others receive it second. All participants are provided with Text A and Text B to read during the experiment. Half of them is introduced to Text A with bolded keywords and text B with unbolded keywords, whereas the other half get to read Text B with bolded keywords and text A with unbolded keywords. Hence, the four created renditions for the texts, where every participant is introduced to one of them using random distribution, includes;

- Text A with bolded keywords followed by Text B with unbolded keywords
- Text A with unbolded keywords followed by Text B with bolded keywords
- Text B with bolded keywords followed by Text A with unbolded keywords
- Text B with unbolded keywords followed by Text A with bolded keywords

Step 2: Reaching out to AFL experts for validation

The criterion for selecting the bolded & unbolded keywords is fully identified by the researcher as there was no verified criterion mentioned in previous studies in Arabic. The criterion was then applied on the two selected texts and shared with the three AFL experts at the American University in Cairo. They were asked to review the texts and share feedback. The three AFL experts agreed with the researcher's application of bolded and unbolded keywords in the text.

Step 3: Reaching out to participants, and conducting the experiment

A total of 32 participants were involved in this study. 15 participants were contacted by two of the AFL experts who reviewed and approved the materials. The other 17 participants were recruited from the university's community on Facebook following a brief on the study and the requirements. After recruiting subjects, the reading experiment was conducted over a course of 5 days at the university's campus. In the first two days, participants who were part of the AFL teachers' classes took part in the study and finished the experiment requirements. On the third, fourth and fifth day, 17 participants went through the experiment procedures individually at the AUC main library. Each experiment lasted from 10 to 20 minutes. The font size used is 12px which is common for websites and news publishers, and the font type is 'Readex Pro' as it is clear and easy to follow. Ahead of each reading experiment, a short brief was presented verbally along with a sample test on screen in order to avoid any misunderstanding of actions requested. The brief included the following steps:

- Researcher reads the consent form out-loud and explains it to the participant, and asks the participant to read it again (if preferred) and sign it. The consent form is added in the appendices section, page 77.
- Researcher gives the participant the manual time tracker in order to measure the reading speed accurately. The researcher here shows the participant how the time tracker starts to measure the time, how to stop and how to restart the stopwatch.
- Researcher then shows the student a sample of the text, without reading it, and asks the participant to start the timer the second she/he starts reading the text. Once the participant is done with reading the first text, he/she will press on pause and write down the time from the stopwatch, and then click next.

- The participant answers two multiple-choice questions related to the text he/she reads, and then the same steps will follow again for the second text.
- The participant finally needs to answer two open-ended questions that he/she can answer in Arabic or English. Once done, the participant will inform the researcher that he/she concludes the experiment.

Phase 4: Measuring the reading time amongst participants (Hypothesis 1)

Reading time, as a dependent variable in this study, measures the time period needed to complete reading of an assigned online text. Each participant had a manual tracker next to him/her in order to accurately write the reading period for each text, individually. The participants were requested to click on the 'start' button when they read the first letter of the text and click on 'pause' when they finish reading. This technique was more accurate and easier to use by students, as digital timers on Google forms may count for additional seconds before or post finishing the reading process. Silent reading is applied, which means that readers do not need to read out-loud when doing the experiment to avoid any interfering factors.

Phase 5: Measuring the comprehension scores amongst participants (Hypothesis 2)

The other dependent variable, comprehension score, is measured by offering two multiple-choice questions to each reading text based on key ideas presented while reading. Each question has three possible answers; one of them is correct. Both dependent variables, including reading speed and comprehension, follow the methodology section of the research conducted earlier by (Rello et al., 2014). Rello et al. (2014). The difference here is that Rello et al. study focused on comprehension questions that looked for the summary of the presented text, whereas the current study looks into specific parts of the text. Each student's speed and comprehension are measured

when using treatment and when not using it. Comparison of performance to detect progress due to treatment (or lack of it) is done at an individual student level (i.e., each student's speed or comprehension is compared to the same student's results when using and when not using treatment).

Phase 6: Measuring participants' preference to independent variable (Hypothesis 3)

To measure the participants' preference and whether they find the strategy of bolded keywords in online news texts useful or not, the experiment ended with two open-ended questions (available in appendix p. 75) in addition to five interviews that lasted less than 5 minutes long, each, and were conducted after the reading experiment. The interviews follow the unstructured format and included questions like; a) can you tell me more about your preference and why? b) did you face any challenge while reading the texts? The interviews serve to affirm or refute statistical findings and provide more insights into the statistical data overall.

3.5. Data Analysis

In order to analyze the data collected in the experiment; a mixed approach of quantitative and qualitative methods is used. The quantitative data sets including the reading speed and reading comprehension scores are first assessed using Shapiro-Wilk test. This test is appropriate for assessing whether the data set collected is generated from a normal distribution or not. If a data set is normally distributed, there is an average mean that can be identified and the data has to follow a symmetric distribution (Lee et al., 2015). On the other hand, the not-normally distributed comes from a population that does not have an expected distribution (Lee et al., 2015). In cases where the data follows a normally distributed curve, a parametric test is used. In cases where the data set is not normally distributed, a non-parametric test is conducted. In the case of the current study, the

quantitative data is expected to not follow a normally distributed curve as the population is coming from different backgrounds. This shall not affect the analysis, as the study focuses on the performance of each participant at an individual level rather than comparing two groups. As for the subjective insights collected by students in the interviews and the open-ended questions, a qualitative method is used to categorize the insights and summarize the main findings. The responses from the open-ended questions are added into a sheet manually for analysis. The interviews follow a non-structured format to drive further explanation to participants' preferences and are limited to only five participants for convenience reasons. The answers are typed manually and added to the same sheet with the answers from the open-ended questions. The answers are then analyzed to detect themes. They are then categorized into three themes that address each research question (as will be discussed in more detail in the results section). In the following chapter, the researcher attempts to present the results of the study, both quantitatively and qualitatively.

Chapter 4: Results

In this chapter, the quantitative and qualitative results are presented and explained based on the three research questions. The first subsection (4.1.) presents the quantitative and qualitative results in relation to reading speed. The second subsection (4.2.) presents the quantitative and qualitative results in relation to comprehension scores and any reference to increased 'focus' as a result during reading. The third section (4.3.) explores the participants' preferences which are discussed both quantitatively and qualitatively.

4.1. Reading Speed

4.1.1. Quantitative Results

The first data set includes the reading speed measures for the 32 participants, including their reading speed for the bolded text and the unbolded text. As the students are coming from different proficiency levels, a Shapiro-Wilk test was applied to check whether the reading speed data collected is normally distributed or not. The p-value for both the bolded text (0.024) and the unbolded text (0.012) is less than 0.05 which confirms that neither of the datasets is normally distributed. To confirm this statement, Figure 2 shows how histograms of the bolded and unbolded text variables are not showing bell-shaped curve.

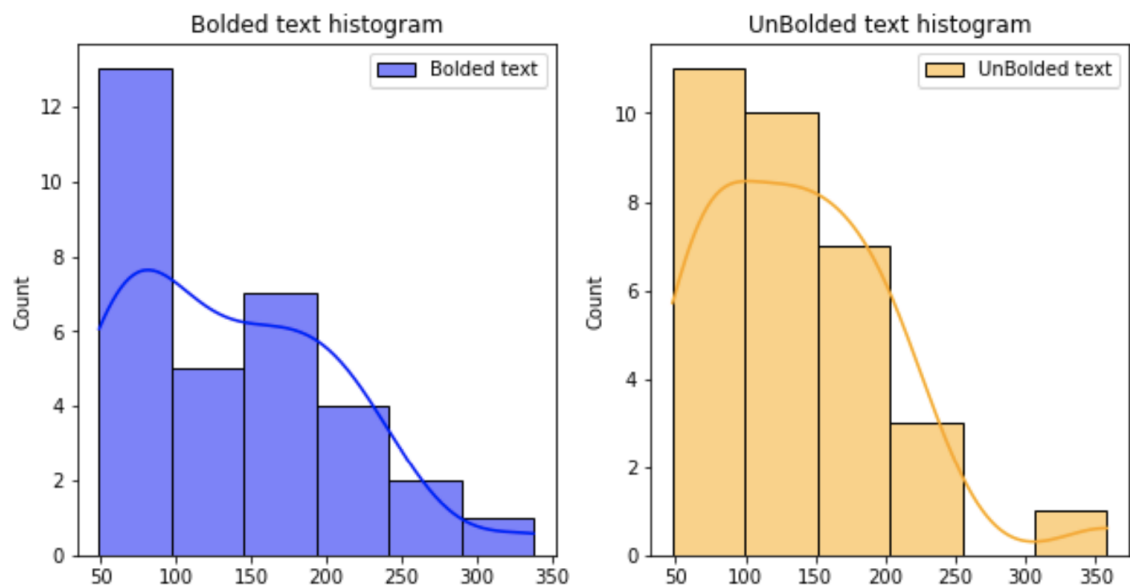


Figure 2:
Speed of Reading - Histograms of bolded and unbolded text variables not showing normal data distribution

According to research, a sample size of less than 30 participants may contribute to a not-normally distributed data (Johnson & Onwuegbuzie, 2004). In the case of this research, the sample size was slightly above the 30-figure threshold. Next, non-parametric tests are conducted to explore whether there is any influence of bolding over reading speed on the individual level. Three tests instead of one test is used in relation to this dimension to ensure the outcome is accurate, especially that the data is not normally distributed.

	Mann-Whitney U Test	Kruskal-Wallis H Test	Wilcoxon Signed-Rank Test
Test statistic	507.0	0.0045	252.0
P-Value	0.9518	0.9464	0.8320

Table 1: Results of three non-parametric tests for the reading speed data of 32 participants

The three tests show that the p-value is greater than significance level of 0.05, according to Table 1, and that fails to refute the null hypothesis; H.1. Bolding keywords in online news texts helps Heritage+ Learners of Arabic read faster. This means that there is insufficient evidence to conclude that there is significant difference between the two formats of reading presented; reading text with bolded keywords vs. reading text with unbolded keywords.

4.1.2. Qualitative Results

The collected responses from the participants indicating a reference to speed comes from three participants only. This indicates that reading speed is not a top mind factor to consider amongst the participants when asked about their reading preferences.

Sub-themes in relation to the detected theme of reading speed	Responses
Text with bolded keywords makes reading feel faster	<i>"I felt I could read faster with the bolded words"</i>
Responses from those not in-favor of the bolding feature in relation to reading speed	

Text with unbolded keywords makes reading feel faster	<p><i>“The bold words in the first one made me remember the bolded information better but I read slower”</i></p> <p><i>“I may have read faster in the second passage with the unbolded words because I just kept on reading without really understanding the words.”</i></p>
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Table 2: Answers collected from participants in relation to reading speed

Table 2 shows the breakdown of students’ responses in relation to speed, which only came from a limited number of participants. The answers are split into two major themes: one theme is about how bolding influences the feel of faster reading and the second theme describes how bolding keywords makes some participants feel they are reading at a slower pace compared to the text with unbolded keywords.

4.2. Comprehension of Texts

4.2.1. Quantitative Results

In order to analyze the comprehension score collected in the experiment, the Shapiro-Wilk test was also conducted to test the normality of the data set revealed by comprehension questions, and the result was identical to the reading speed analysis. The comprehension scores of 32 participants are not normally distributed as the p-value of the scores for the four questions presented in the study to test subject’s text comprehension is less than 0.05 which typically reflects the evidence of the null hypothesis, as illustrated in Table 3 [*Shapiro-Wilk test results for the comprehension score data set*].

For Q1_Bolded: Test statistic: 0.6322636604309082, p-value: 9.737414785604415e-08 For Q2_Bolded: Test statistic: 0.5848231315612793, p-value: 2.4324521064045257e-08 For Q1_UnBolded: statistic: 0.6365399360656738, p-value: 1.1094333274286328e-07 For Q2_UnBolded: Test statistic: 0.637959361076355, p-value: 1.1587712123173333e-07

Table 3: *Shapiro-Wilk test results for the comprehension scores data set*

Given that the data set is not normally distributed as shown in Table 3, a chi-squared test was conducted to measure how much the observed values differ from the expected values under the null hypothesis of independence between the two variables tested. This test covered the six combinations of the questions presented in the study. This is why the chi-square is selected as it has the capacity to assess cross-influence between many variables at once. This includes all the renditions of Q1 and Q2 as shown in Table 4, including the reading format (bolded vs unbolded).

Q1 Bolded and Q2 Bolded: The chi-squared test statistic is 0.748 with a p-value of 0.387 Q1 Bolded and Q1 Unbolded: The chi-squared test statistic is 1.914 with a p-value of 0.166 Q1 Bolded and Q2 Unbolded: The chi-squared test statistic is 3.175 with a p-value of 0.075 Q2 Bolded and Q1 Unbolded: The chi-squared test statistic is 0.0 with a p-value of 1.0 Q2 Bolded and Q2 Unbolded: The chi-squared test statistic is 0.0 with a p-value of 1.0 Q1 Unbolded and Q2 Unbolded: The chi-squared test statistic is 2.008 with a p-value of 0.156
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Table 4: *Results of the chi-squared test for the comprehension scores data set*

Based on the chi-squared test results, there is no significant effect found of bolded keywords on comprehension scores amongst Heritage+ learners of Arabic compared to non-bolded keywords presented in the experiment, on the individual level.

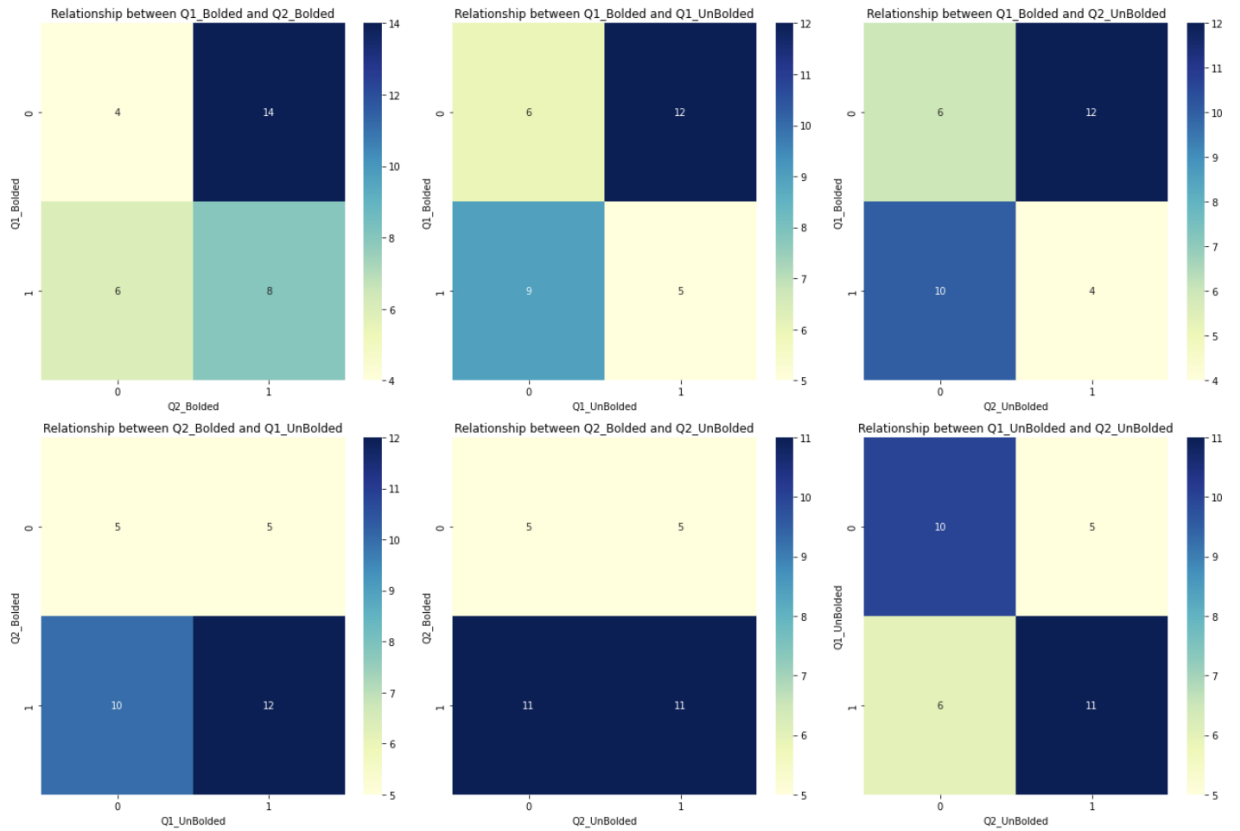


Figure 3: The relationship between the salience feature and comprehension scores

The figure 3 illustrates visually the relationship between the bolding feature and the comprehension scores for each text rendition on the individual level. This means that there is no identified influence of bolded keywords over the scoring of Q1 or Q2 or both combined versus the influence of unbolded keywords over the scoring of Q1 or Q2 or both combined for each participant.

4.2.2. Qualitative Results

The collected responses from the participants that come from the interviews and the open-ended questions show that students feel that the texts with bolded keywords helps them comprehend more effectively and focus better while reading. The answers are categorized into two themes: focus and comprehension. The responses that mention focus as a key benefit are illustrated

in Table 5, and those that mention the comprehension of the text as a benefit of the bolded keywords is illustrated in Table 6. It is important to note that there are some responses that link the bolding feature to the lack of focus, which is the opposite of what is mentioned. Those are added in table 5, and explained in this chapter as well as Chapter 5.

Sub-themes in relation to the detected theme of focus	Responses
Focusing mainly on bolded keywords	<p><i>"Helps focus on content."</i></p> <p><i>"My focus shifted to be more focused on the bold words in the first text."</i></p> <p><i>"The one with bolded words was better for me as in many times when I get lost in what I am reading it gets my attention back and makes me focused."</i></p>
Noticing and recognizing the important part of the text	<p><i>"With bolded words since it helps me focus on certain words more, and feels more organized somehow unlike the unbolded words."</i></p> <p><i>"The text was highlighting key points, so I knew when to pay extra attention."</i></p> <p><i>"I felt like the bolded text made me consider these words as keywords."</i></p> <p><i>"I preferred to read the text with bold font. It highlights the main points clearly and is straight to the point."</i></p>
Representing an indicator to where readers lose track while reading (loss of focus)	<p><i>"I preferred the second text (the one with bold words), it almost assisted me in reading the text and when I lost focus it was like an indicator to where I had lost track."</i></p>
Helping participants to find what they want from a specific text when revisiting it	<p><i>"I can go back to find what I want."</i></p> <p><i>"It is great if you want to learn something."</i></p>

Responses from those not in-favor of the bolding feature in relation to focus	
Making participants lose focus while reading (given how distracting the text can be with the cues)	<p><i>“I felt more focused while reading the second text (without bolding feature). I think the bolded words were distracting”</i></p> <p><i>“The second one (with bolded keywords) I had to read it more than once as I sometimes lost focus or I had to understand it better.”</i></p>

Table 5: Answers collected from participants in relation to focus

Table 5 shows the responses collected from participants who believe reading texts with bolded keywords make them focus more on main concepts, recognize and notice the important part of the text. The bolding feature also helps participants create a more organized reading process, and that contributes to making the text easy to read, according to some participants as shown in the above table. For learners who feel the lack of focus at times while reading, the bolding feature represents an indicator to where readers lose track while reading and help bring back their attention. Finally, the bolding feature also helps them find what they want from a specific text, when asked to revisit it. On the other hand, there are some participants that feel the bolding feature makes them lose focus while reading. To them, the bolding feature makes them focus only on the bolded keywords and that distracts them. Their answers are listed in Table 5. The collected responses show clearly the dominance of comments linking the bolding feature to better comprehension. In table 6 (below) references to the theme of comprehension are divided into three sub-themes.

Sub-themes in relation to the detected theme of comprehension	Responses
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Assisting readers to understand the content of the article they read	<p><i>“The bolded keywords helped me understand the context better by not having to highlight those words in my head.”</i></p> <p><i>“It allowed me to focus on the content rather than simply just the bolded words.”</i></p> <p><i>“I understood the context easier in the bolded words.”</i></p> <p><i>“I preferred the second text because it felt easier to read and understand because of the bolded words.”</i></p>
Helping readers comprehend important or key concepts	<p><i>“It helped with comprehending the semantic meaning of words.”</i></p> <p><i>“I was able to understand the main points immediately without worry.”</i></p>
Helping readers remember information	<p><i>“I remember the keywords.”</i></p> <p><i>“The non-bolded text was a little bit harder to focus on, and I do not remember anything from it, not like the bolded one, I remember the keywords in it.”</i></p> <p><i>“It made the information stuck in my mind.”</i></p> <p><i>“The bold words in the first one made me remember the bolded information better.”</i></p> <p><i>“It allowed my brain to easily read the text and be able to save the right information.”</i></p> <p><i>“I can go back to find what I want”</i></p>

Table 6: Answers collected from participants in relation to comprehension

Comments listed in table 6 suggest that participants believe that reading texts with bolded keywords helps them understand the content of the article they are reading, and not only the

meaning of the keywords. Additionally, some participants indicate that thanks to bolding, they understand specific keywords better. Finally, around six participants mention how the bolding feature helps them remember information especially at a time where maintaining information is challenging which is necessary for better comprehension. It is worth noting that there is no mention by any respondent as to how the salience feature can negatively impact comprehension.

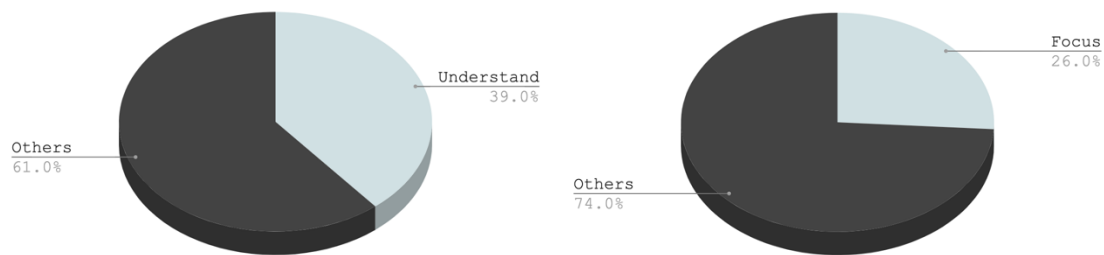


Figure 4: The figure on the left shows the frequency of the word “Understand” in responses in favor of the bolding feature, and the other one for the frequency of “Focus”

After analyzing the data, it was noted that 26% of responses (of those preferring the bolding feature) include the word ‘**Focus**’ in the first open-ended question. The figure did not look at the responses from the second question because the question itself included the word ‘focus’ and that may have influenced the answers. Additionally, the word ‘**understand**’ was mentioned by 39% of those preferring the bolding feature – as shown in figure 4. Both keywords relate directly to better comprehension. In light of the above results, it is safe to assume that participants believe the bolding feature helps them focus more and comprehend better the meaning of the article context and specific keywords during the process of reading.

4.3. Individual Preferences of Reading Format

4.3.1. Quantitative Results

To explore the preferences of the students in relation to using the bolding feature while reading online texts in Arabic, the collected responses from the participants were analyzed both quantitatively and qualitatively. On the quantitative front, each participant in the open-ended question identified which reading format (with or without bolded keywords) he/she prefers followed by the personal justification or opinion.

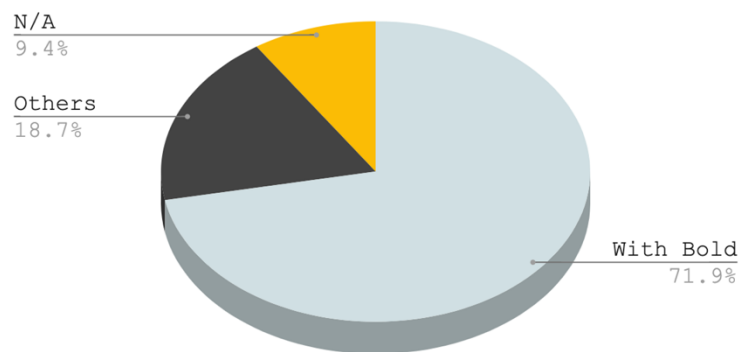


Figure 5: The figure shows the percentage breakdown for the participants' preferences

Based on the collected responses, 71.8% of participants chose bolded keywords as their preference whereas 18.7% preferred the original text without the bolded typeface feature and the remaining 9.37% of the sample population remained neutral by not specifying a certain preference. Thus, data here suggests a preference of bolded to unbolded texts which supports the study's third hypothesis namely that Heritage+ learners of Arabic prefer to read texts with bolded keywords.

It is important to also measure any possible correlation between reading speed and individual preferences - as both are counted quantitatively. For this case, a chi-square test was conducted and the resulting p-value was 0.2741. This means that there is not a statistically significant association between reading speed in bolded text and preference at the significance level of 0.05. The above indicates that there is no evidence that the participants' preference for

bolded or unbolded text is related to their reading speed in bolded text. Similarly, the Chi-square test for unbolded text and preference shows a chi-square statistic of 64.0000 and a p-value of 0.3380. This also means that there is no statistically significant association between reading speed in unbolded text and preference at the significance level of 0.05. Based on the findings, there is not enough evidence to showcase how participants' preference for bolded or unbolded text may relate somehow to their reading speed.

4.3.2. Qualitative Results

The collected responses of participants show how some participants link the bolding feature to reading speed according to table 2, focus or lack of focus according to table 5, and comprehension according to table 6. The final theme that is presented by participants is the link between the bolding feature and the engagement with the text. Table 7 lists down the responses from participants in relation to text engagement, both positively and negatively.

Sub-themes in relation to the detected theme of text engagement	Responses
Making the text more appealing to the reader's eyes	<p><i>"I feel it was more appealing to the eye."</i></p> <p><i>"With bolded words because the text stood out more, even without realizing it."</i></p>
Contributing to making the text look shorter in length according to the reader's visually driven perspective	<p><i>"I felt it was shorter, I don't know why."</i></p> <p><i>"It makes me feel as if the text is short because I get distracted quickly."</i></p> <p><i>"I felt I could read faster with the bolded words."</i></p>
Making the text more engaging to read and less boring	<p><i>"I focused more with the bolded words because it wasn't boring."</i></p>

Creating a more organized reading process, and the text becomes easier to read	<i>"It helps organize my thoughts while reading."</i> <i>"Bolded text made it easier to read and grasp the meaning."</i> <i>"I feel that I got more information out from the text that had bolded words in it."</i>
Increasing the curiosity level amongst readers, and encouraging them subconsciously to finish the text	<i>"It made me curious."</i> <i>"This made me motivated unconsciously to finish the text."</i> <i>"I felt motivated to finish reading."</i>
Responses from those not in-favor of the bolding feature in relation to focus	
The text with bolded keywords makes eyes focused only on keywords	<i>"I prefer the text without the bolded words because my eyes kept straying to the bold words while reading the entire text"</i>
The text with unbolded keywords is easier	<i>"I preferred the one without the bolded words, as it felt easier to read"</i>

Table 7: Answers collected from participants in relation to engagement with text

According to table 7, the bolding feature makes the text more appealing to the reader's eyes. Some participants believe that this feature makes the text look shorter in length, and that drives them to read faster. The feature also makes the text more engaging to read and less boring. The visual factors in the text may indeed increase the curiosity level amongst some readers, according to their response, and encourage them subconsciously to finish the text. On the other hand, participants who do not prefer to read texts with bolded keywords mention how this feature guides their eyes to focus only on keywords, or in other words engage with part of the text only and ignore the rest of the text. Another participant says that the text without bolded keywords is easier to read which contradicts with what other respondents say in Table 7. To conclude, the

results show the majority of participants prefer to read texts with bolded keywords. The following chapter is dedicated to discuss the results and link them to the three hypotheses.

Chapter 5: Discussion

In this chapter, the results are discussed and explained to answer the research questions. The discussion will reference some results from previously conducted research, as mentioned earlier in Chapter 2. The first subsection addresses the influence of bolded keywords on reading speed using both quantitative and qualitative results analyzed in the previous chapter. The second subsection analyzes and addresses the influence of bolded keywords over comprehension and focus, and the third subsection summarizes participants' perceptions and preferences towards reading texts with bolded keywords.

5.1. Reading Speed

5.1.1. Quantitative Data Discussion

The first hypothesis of this study assumes that bolding keywords in online news texts helps Heritage+ learners of Arabic read faster. The quantitative data presented in table 1 under section 4.1.1. confirms that there is no significant effect found of bolded keywords on reading speed amongst Heritage+ Learners of Arabic. This finding mirrors earlier research, which confirms no significant impact of bolded keywords in a text on readability amongst Spanish native speakers with and without dyslexia (Rello et al., 2014). Additionally, this result also mirrors previously conducted studies on other salience features in relation to reading speed (Gagl, 2016; Ganayim & Ibrahim, 2013). Such results may be linked to the fact some participants are not trained in advance to use this reading cue while reading the text, which leads to participants' reading hesitation at the beginning of the experiment. According to Hartley (2013), it is important to introduce participants to salience features used in text ahead of practice in order to increase its potential to facilitate

reading (Hartley, 2013). Another reason can be linked to the fact some participants may be used to other reading cues particularly for comprehension purposes and not to facilitate reading speed.

5.1.2. Qualitative Results

As for the qualitative part, only three responses out of the 32 participants referenced reading speed. This means that speed is not top of mind amongst Heritage+ learners of Arabic and they prioritize other indicators to effective or non-effective reading. To one participant, however, the text with bolded keywords makes him/her feel as if the reading speed increases, whereas two participants indicate the opposite observation. **To conclude, the study findings presented mainly by the quantitative data, confirm the refutation of the first hypothesis.**

5.2. Text Comprehension

5.2.1. Quantitative Data Discussion

Based on the results detailed in table 2 under the section 4.2.1., there is no significant effect found of bolded keywords on comprehension scores amongst Heritage+ learners of Arabic. A similar result was confirmed in the study by Rello et al. (2014) where bolded keywords had no significant effect on comprehension amongst Spanish native speakers without dyslexia; it must be mentioned however that bolding had significant influence amongst the Spanish native speakers with dyslexia (Rello et al., 2014). This could mean that people with reading deficiencies are expected to benefit more from bolding compared to students with literacy problems that result from reasons other than reading deficiency.

Another explanation is the fact HLLs in general are exposed to a limited set of vocabulary and syntactic rules in Arabic and that may contribute to lower comprehension scores in general (Abu-Rabia, 2000). This could also be true of Heritage+ learners of Arabic, leading to a situation where bolding of words that may be unknown to subjects is of no effect on their comprehension.

Another explanation, which was also referred to in relation to speed, could be that the students did not benefit from the bolding feature because they are not introduced to this specific reading cue in advance (Hartley, 2013). The current study asks participants to read the text once in order to answer the comprehension questions. This may have been an obstacle in the reading process as learners may have benefited from the bolded feature more when re-reading the text and seeing the questions as they can find particular information with the help of the boldtype feature. It is also important to consider the selection of questions, as that may be labeled as a disrupting factor in exploring the influence of bolded keywords on comprehension. In the study conducted by Rello et al. in 2014, the researchers used multiple-choice questions but in a much more generic way to evaluate the participants' understanding of the text (Rello et al., 2014). In this study however, more specific content-related questions were used (including questions about numbers and specific vocabulary items - please refer p. 70 & 74 for a detailed copy of such questions). In conclusion, it is possible to say that the difference between the quantitative results and the study hypothesis in relation to comprehension may have resulted from factors related to the way the experiment is structured and some shortcomings in the way it is administered (as described earlier). In light of the above, results of interviews are expected to be important since an open discussion might show how far students relied on bolding as a cue for comprehension or ignored that cue.

5.2.2. Qualitative Data Discussion

In order to more deeply explore the influence of bolded keywords over comprehension to get a fuller picture, it is essential to get the participants' personal perceptions through data elicited during the one-on-one interviews and open-ended questions. These seem to be in contradiction with quantitative results since they reveal how the majority of participants agree that bolded

keywords help them (1) focus and (2) comprehend the text while reading. The ‘focus’ aspect is very much connected to increasing comprehension (Gernsbacher, 1993).

According to table 5, many participants confirm that the bolding feature increases their focus on certain keywords, helps them notice and recognize important concepts, know exactly where they lose track while reading and find specific information from a text. Those sub-themes fall under the umbrella of ‘focus’ while reading a text. As mentioned in the study introduction, people's attention span is decreasing by default overtime, as people are increasingly multi-tasking over the internet (Carr, 2010). The approach of bolded keywords may address this issue in the case of Heritage+ learners by amplifying their attention span during online reading. This can happen by encouraging them to focus on the important concepts in that short period of time instead of wasting it on irrelevant details.

Amongst the responses, participants confirm how the bolding feature helps them find particular information in a text. This advantage is mentioned in Wang’s study in 2013, but for Chinese text highlighted in bold (Xu et al., 2021). Such results can be helpful for educational materials or for pedagogical activities in general, as learners can revisit reading texts to look for specific structures, or analyze specific phrases semantically. Some participants also indicate that the bolding feature makes them feel unfocused during reading, and that has been highlighted by only two participants.

Some participants also highlight how the bolding feature helps them comprehend the text better, as shown in table 6. To them, the feature helps them understand the full context of the article. This is very important as it could reduce misinformation rates over the internet. The bolding feature also drives some readers to comprehend semantically driven keywords in a sentence, which helps in applying critical thinking while reading. Finally, this feature also helps some readers

remember and maintain information which is essential in the time where lack of focus is continually increasing amongst Heritage+ learners of Arabic, and particularly those who fall under Generation Z.

In conclusion, although the quantitative assessment shows no significant impact of bolded keywords on comprehension scores (for reasons suggested above), **the qualitative insights confirm the potential impact of bolded keywords over students' focus and comprehension.** This means that the second hypothesis is partially confirmed; H.2: Bolding keywords in online news texts helps Heritage+ Learners of Arabic focus more while reading online texts and that leads to better comprehension scores. The difference between the two types of data (quantitative and qualitative data) may be attributed to the fact that quantitative data measures student comprehension as reflected by the extent to which students successfully respond to comprehension questions. This however may have been affected - as discussed above - by factors related to students (prior training or lack of it, and knowledge of Arabic) and factors related to procedures used to conduct the experiment (not explaining tasks to students before carrying out). The difference between the two approaches (quantitative and qualitative results) also open doors for future research to assess the comprehension, not based on immediate scores, but rather looking into other factors like allowing learners to revisit the article for certain tasks, or answer more generic questions that test their understanding of the text.

5.3. Reading preference amongst Heritage+ Learners of Arabic

5.3.1. Quantitative & Qualitative Data Discussion

Heritage+ Learners of Arabic prefer to read texts with bolded keywords (refer to figure 5) **and this confirms the third hypothesis in the current study.** The reasons for this preference relate to the reading process itself but also reasons related to personal satisfaction. The

former includes themes like focus, comprehension and speed as explained in earlier sections 5.1., 5.2. and 5.3. The fourth theme is related to text engagement. The text with bolded keywords is more engaging, and less boring. The bolding feature, according to some students, contributes in making the text more visually appealing to the eye, and that indeed increases their focus subconsciously. This insight matches previously conducted research, where it states that the bolding feature in the world of typography attracts people's attention (Luckiesh & Moss, 1940). Many respondents also feel like they are engaged more with bolded keywords as that feature increases their curiosity level, and encourages them to finish reading the full text. Many researchers claim that reading engagement is associated with achieving better comprehension, particularly for younger learners of language (Baker & Wigfield, 1999; Guthrie et al., 2007). Engagement and motivation are important, and are connected to higher achievement results (McElhone, 2012). The issue of maintaining focus and thus comprehension can also correlate with the text length (Carr, 2010) and that can be linked to text engagement. Participants who prefer reading the text with bolded keywords in Arabic highlight how this salience feature makes the text look shorter in length. That in fact may drive readers to read the full text, or read a higher portion compared to long texts with unbolded keywords. The feel of reading a shorter text contributes to the feel of reading faster, according to one participant in the interview. In general, the salience feature, according to some participants, makes the text more appealing to the reader's eyes.

On the other side of the equation, around 18% of participants prefer the text with unbolded keywords due to one main theme. They say that the text with unbolded keywords is less distracting as the eye is no longer straying to only the bolded keywords. This viewpoint is verified by earlier research, claiming that some individuals perceived bolded text as too loaded and confusing (Priestly, 1991). This in fact means that, to some students, the bolding feature encourages

following a bottom-up reading, rather than top-down reading strategy that is necessary to comprehension. The bottom-up reading strategy means that readers decode every word in a text in order to understand the text gradually (Barnett, 1989). On the other hand, the top-down reading approach focuses on the reader rather than the text itself. Through this approach, readers build their own schemata in order to comprehend the text effectively (Barnett, 1989). This actually contradicts with the response from those who preferred the bolding feature, as they felt like bolded keywords made them understand the full context rather than focusing only on the keywords. There is truly a difference between those who prefer the feature and others who prefer the unbolded keywords. However, it remains obvious that the majority found the bolding feature more helpful, leading to better focus, comprehension and engagement with the text as the previous discussion sections conclude. The contrast has possibly happened because some individuals may find cues as distracting, or they may have not been trained on any other reading cue. This is why the bolding feature, like any other salience feature, can never be presented as one solution to all readers. However, it remains a potential solution that helps readers, according to their preferences and previous experiences.

5.4. Limitations

There are some limitations that may have impacted the study findings, and are mainly related to the study design including:

- Limited equipment – eye tracking system – and hence the fixation duration is not measured in the current study. This tool helps identify areas readers focus on unconsciously, and explores whether the bolding feature helps guide the eyes towards key concepts or not.
- Number of participants is small compared to quantitative studies in that format

- Comprehension questions look for specific information instead of assessing the participants' overall understanding of the text.
- Study does not allow readers to revisit the article to look for answers, which may have contributed to better comprehension scores.
- Participants are not pre-trained to use the bolding feature for reading speed and comprehension reasons. It would have been better to ask participants to try reading texts with this feature a few times ahead of the study.
- Participants may have been overwhelmed, especially those with lower proficiency level, to read two long articles and answer four comprehension questions and two open-ended questions all at once. It may have been better to split the two texts on two days to reduce the pressure on participants involved.
- Limited number of interviews were conducted.
- Interviews were conducted right after the reading experiment was over, and this may have limited the benefits of the interviews. Interviews are usually designed to explore additional insights to what is found from the initial study results. This procedure was hard to follow in the current study as participants were wrapping up their courses on campus at the time of the study, and it was hard to connect with them again to get further insights.
- Absence of a control group in the study.
- Sound of manual time tracker (beeps) affects the focus of some participants.
- Some participants prefer to read loudly, given their low proficiency level.

5.5. Pedagogical Suggestions

Based on the study findings, and mainly derived from the participants' preferences, teachers can make use of the bolding feature in order to help Heritage+ learners of Arabic focus

more while reading and comprehend the text as well as the key concepts more effectively.

Suggested teaching activities include:

- **Reverse feature application:** Teachers can ask students to read a given text, and apply the bolding feature on main concepts according to their perspective. The purpose of this activity is to engage the learner with the text and with new terminologies.
- **Remember collocations:** For topic-driven language classes, teachers can apply the bolding feature on special collocations that are tied up to that specific topic in order to help learners remember such collocations for direct use. A few examples from the media include: (خطأ فادح، قوات الاحتلال، مساع حميدة)
- **Explore the meaning of new terminologies:** Teachers can use the bolding feature on new concepts within a text. When a student clicks on one bolded keyword, the meaning of that chosen word can pop-up directly on screen, using available platforms. This way, the learner will be engaged, and motivated to learn the word; leading to better comprehension in the long run.
- **MSA & colloquial language learning:** As Heritage+ Learners of Arabic have a better inventory of their heritage language(s) versus the one related to MSA, it is advisable to use the bolding feature on words that are somehow similar between the two. This way, the learner will be motivated to continue reading the article and explore the difference between the two language variations.

5.6. Future Research

- In terms of participants, future studies can explore the influence of bolded keywords amongst foreign language learners of Arabic as well as native speakers of Arabic, as both face issues of retaining their focus online.

- The study can also be conducted amongst people with reading difficulties including dyslexia, Attention-Deficit / Hyperactivity Disorder as well as partially sighted individuals.
- As ‘focus’ is mentioned by many participants in the study, this variant can be explored in future research, instead of only looking at reading speed and comprehension.
- Another study can be conducted in the future where the roots of words in Arabic are bolded to explore the potential impact on speed and comprehension.
- Another research can be conducted to look into the influence of bolded keywords on readers’ fixation duration and eye movement in general, in order to identify how eyes react to this reading cue or other salience features particularly on Arabic online texts.

The bolding typeface with the assigned criteria as stated in this study can be encoded in a Chrome extension for those who prefer to activate it while reading online texts. This is something that can be explored to scale this feature’s benefits to more individuals, and to help expand the reach of future study respondents.

5.7. Conclusion

There is no doubt that salience features may have a positive influence over individuals’ reading speed and comprehension. The level of that influence depends on many factors including proficiency level of readers, the materials used, the way the salience feature is presented, the set-up of presenting that feature along with many other considerations. The current study aims to explore the influence of bolding keywords in Arabic online texts over reading speed and comprehension amongst Heritage+ learners of Arabic. This group of individuals face various challenges, and has not been under spotlight by researchers. Heritage+ learners in general are better equipped with aural skills compared to writing or speaking skills, and that is why salience features

may present a key solution to help them develop such skills in the minority language, in this case, MSA. According to the current study, the quantitative insights for both reading speed and comprehension show no significant impact of bolded keywords. However, the qualitative data, gathered from one-on-one interviews and open-ended questions show clearly readers prefer the bolding feature. There are many factors involved in building the participants' preferences for the bolding features, categorized into three themes; helping readers to focus while reading, engage with presented texts, and comprehend articles more effectively. Although the study comes with limitations as mentioned earlier, it still presents insights that can be amplified in pedagogical practices in language teaching classrooms. It is also important to count for readers getting trained on salience features, whether the bolding feature or other reading cues, ahead of testing to facilitate more accurate results. Based on the study results, this salience feature may have positive influence amongst not only Heritage+ Learners of Arabic, but also foreign language learners of Arabic and native speakers of Arabic, which can be tested in future potential research. This influence of this feature can also be explored on individuals with reading difficulties, and to readers of other languages. At the end of the day, individuals have various preferences when it comes to reading.

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Appendices

Materials:

Criteria for choosing unbolded keywords

1. Functional words including prepositions, conjunctions, adverbs of place and time
2. Adjectives (single or multi-phrase adjective)
3. Relative clauses
4. Verbs that do not add additional meaning and are often used in news contexts
5. Nouns that follow the prepositions and the possessors
6. Phrases that are added in news contexts as connectors between sentences

1. الكلمات الوظيفية (وتشمل أحرف الجر، وحروف العطف، وظروف الزمان والمكان) فيما عدا ما اتصل الأفعال المتعدية بحرف جر
2. الصفات بما فيها الكلمات المفردة أو المركبة
3. الجمل التي تصف حدثاً ما أو شيء ما في الجملة، وإزالتها لا تضر بالمعنى الرئيسي
4. الأفعال التي لا تضيف معنى للجملة مثل بعد، وتمّ وغيرها - مستخدمة بكثرة في نصوص الأخبار
5. الأسماء المجرورة أو المضاف إليه الذي إن حذف قد يضرّ بالتركيب النحوي فقط وليس بالمعنى الموجود في الجملة
6. الجمل التي توضع في النصوص الإخبارية للربط بين الفقرات

Text A with bolded keywords (with criteria listed above)

Source Link - BBC.com: <https://www.bbc.com/arabic/interactivity-64696072>

يعد (4) **تأثير الزلزال** على (1) **الأطفال** و (1) **الأسر** في (1) **المنطقة** كارثيًا (2) حيث (1) **ترك مئات الآلاف** من (1) **الأشخاص** (5) في (1) **ظروف بائسة**. لقد (1) **فقدت** العديد (2) من (1) **العائلات منازلها** و (1) **تعيش** الآن (1) في (1) **ملاجئ مؤقتة** (2)، غالبًا (1) في (1) **ظروف** شديدة (2) **البرودة** حيث (1) يؤدي تساقط الثلوج والأمطار إلى تفاقم معاناتهم (3) وصف لل**ظروف البائسة والباردة**.

و (1) **ألحق الزلزال أضرارًا** واسعة النطاق (2) **بالمدارس** وغيرها (1) من (1) **البنى التحتية**، كما (1) **بات** (4) **الحصول** على (1) **المياه** الصالحة للشرب (2) و (1) **الصرف الصحي** مصدر قلق كبير (2)، وذلك (1) بالإضافة إلى (6) **الاحتياجات الصحية** للسكان المتضررين (5).

وتعمل (4) **اليونيسف** على (1) **إيصال المساعدات** المنقذة للحياة (2) إلى (1) أكبر عدد ممكن (2) من (1) **الأطفال** و (1) **الأسر** حيث (1) **تولي** (4) **أولوية** قصوى (2) **لحماية الأطفال** في (1) كل من (1) **تركيا** و (1) **سوريا**، بما في ذلك (6) **تحديد الأطفال غير المصحوبين** بذويهم (5+1) أو (1) **المنفصلين** عن ذويهم (5+1) و (1) **لم شملهم** بعائلاتهم (5+1)، فضلاً (1) عن (1) **تقديم الدعم النفسي للأطفال** الذين عانوا من صدمة الزلزال (3).

بالإضافة إلى ذلك (6)، تعمل (4) **اليونيسف** على (1) **ضمان عودة الأطفال** إلى (1) **التعليم** في أسرع وقت ممكن (5+1)، ومن ثم (1) فإنها تعمل على (6) **تقييم الأضرار** التي (1) لحقت (4) **بالمدارس** و (1) **الاستعداد للإصلاحات** الفورية (2) و (1) **توفير أماكن التعليم** المؤقتة (2).

وعلى الرغم من هذه الجهود (6)، **لا تزال احتياجات السكان المتضررين (2) هائلة**، والتحديات عديدة ومعقدة (3) حيث (1) **تتزايد صعوبة الوصول** إلى (1) **المحتاجين** وتقديم المساعدة اللازمة لهم (3) **بسبب الأضرار** والدمار (5+1) الذي (1) لحق (4) **بالطرق الرئيسية** و (1) **البنية التحتية**، فضلاً عن (6) **ظروف** (5) **الطقس شديدة البرودة** وتساقط الثلوج والأمطار (3).

Text A with bolded keywords

يعد **تأثير الزلزال** على **الأطفال والأسر** في **المنطقة** كارثيًا حيث **ترك مئات الآلاف** من الأشخاص في **ظروف بائسة**. لقد **فقدت** العديد من **العائلات منازلها** و**تعيش** الآن في **ملاجئ مؤقتة**، غالبًا في **ظروف شديدة البرودة** حيث يؤدي تساقط الثلوج والأمطار إلى تفاقم معاناتهم.

و**ألحق الزلزال أضرارًا** واسعة النطاق **بالمدارس** وغيرها من **البنى التحتية**، كما بات **الحصول على المياه الصالحة للشرب والصرف الصحي مصدر قلق** كبير، وذلك بالإضافة إلى **الاحتياجات الصحية** للسكان المتضررين.

وتعمل **اليونيسف** على **إيصال المساعدات** المنقذة للحياة إلى أكبر عدد ممكن من **الأطفال والأسر** حيث تولي **أولوية قصوى لحماية الأطفال** في كل من **تركيا وسوريا**، بما في ذلك **تحديد الأطفال غير المصحوبين** بذويهم أو **المنفصلين** عن ذويهم ولم **شملهم** بعائلاتهم، فضلًا عن **تقديم الدعم النفسي للأطفال** الذين عانوا من صدمة الزلزال.

بالإضافة إلى ذلك، تعمل **اليونيسف** على **ضمان عودة الأطفال إلى التعليم** في أسرع وقت ممكن، ومن ثم فإنها تعمل على **تقييم الأضرار** التي لحقت **بالمدارس والاستعداد للإصلاحات** الفورية و**توفير أماكن التعليم المؤقتة**.

وعلى الرغم من هذه الجهود، لا تزال **احتياجات السكان المتضررين هائلة**، والتحديات عديدة ومعقدة حيث **تتزايد صعوبة الوصول إلى المحتاجين** وتقديم المساعدة اللازمة لهم **بسبب الأضرار** والدمار الذي لحق **بالطرق الرئيسية والبنية التحتية**، فضلًا عن **ظروف الطقس شديدة البرودة** وتساقط الثلوج والأمطار.

Text A with unbolded keywords

يعد تأثير الزلزال على الأطفال والأسر في المنطقة كارثيًا حيث ترك مئات الآلاف من الأشخاص في ظروف بائسة. لقد فقدت العديد من العائلات منازلها وتعيش الآن في ملاجئ مؤقتة، غالبًا في ظروف شديدة البرودة حيث يؤدي تساقط الثلوج والأمطار إلى تفاقم معاناتهم.

وألحق الزلزال أضرارًا واسعة النطاق بالمدارس وغيرها من البنى التحتية، كما بات الحصول على المياه الصالحة للشرب والصرف الصحي مصدر قلق كبير، وذلك بالإضافة إلى الاحتياجات الصحية للسكان المتضررين.

وتعمل اليونيسف على إيصال المساعدات المنقذة للحياة إلى أكبر عدد ممكن من الأطفال والأسر حيث تولي أولوية قصوى لحماية الأطفال في كل من تركيا وسوريا، بما في ذلك تحديد الأطفال غير المصحوبين بذويهم أو المنفصلين عن ذويهم ولم شملهم بعائلاتهم، فضلًا عن تقديم الدعم النفسي للأطفال الذين عانوا من صدمة الزلزال.

بالإضافة إلى ذلك، تعمل اليونيسف على ضمان عودة الأطفال إلى التعليم في أسرع وقت ممكن، ومن ثم فإنها تعمل على تقييم الأضرار التي لحقت بالمدارس والاستعداد للإصلاحات الفورية وتوفير أماكن التعليم المؤقتة.

وعلى الرغم من هذه الجهود، لا تزال احتياجات السكان المتضررين هائلة، والتحديات عديدة ومعقدة حيث تتزايد صعوبة الوصول إلى المحتاجين وتقديم المساعدة اللازمة لهم بسبب الأضرار والدمار الذي لحق بالطرق الرئيسية والبنية التحتية، فضلًا عن ظروف الطقس شديدة البرودة وتساقط الثلوج والأمطار.

Comprehension Questions for Text A:

- سؤال عام:
- ما هي إحدى مهام اليونيسف لدعم الأطفال المتضررين من الزلزال؟
 - تقديم الدعم الصحي لهم
 - تقديم الدعم النفسي لهم
 - تقديم الدعم المادي لأهاليهم
 - تقديم الدعم الغذائي لهم
- سؤال خاص:
 - كم بلغ عدد المتأثرين من الزلزال وهم في ظروف معيشية صعبة؟
 - أكثر من عشرة آلاف شخص
 - أكثر من أربعين ألف شخص
 - أكثر من مئة ألف شخص
 - أكثر من مليون شخص

في أعقاب (1) **الزلازل** المدمر (2) الذي ضرب جنوب شرقي **تركيا** وشمال **سوريا** (1+2)، **يعيش** **الناجون** منه (1) **اضطرابات نفسية** عميقة (2). فمنذ (1) وقوع الزلزال (6)، **يرى العديد** منهم (1) أن (1) **في أي لحظة يمكن** أن (1) **يعاد سيناريو الزلزال**، وكل شخص معرّض لاضطرابات نفسية معيّنة بعد خوض تجربة مروعة أو صادمة (3 - إعادة الوصف للحالة النفسية).

و (1) **حذرت** منظمة الأمم المتحدة للطفولة (1) "**اليونيسف**" من أن (1) **ملايين الأطفال بحاجة** ماسة (2) إلى (1) **الدعم الإنساني**. **اضطراب ما بعد الصدمة** هو **مصطلح** يتضمن (4) **الآثار النفسية** على من (1) **عاش كارثة** أو حادثة (1+5) ما سببت له صدمة (3).

قد (1) **تشمل الأعراض إعادة ذكريات** الماضي (5) و (1) **الكوابيس والقلق** الشديد (2)، بالإضافة (1) إلى (1) **أفكار لا يمكن السيطرة عليها** حول الحدث (1+5)، وقد (1) **تظهر الأعراض جسدياً** مثل (1) **إيجاد** (5) **صعوبة** في (1) **النوم** و (1) **التعرق** والشعور (1+5) **بآلام** في (1) **الجسم** و (1) **الغثيان** و (1) **الارتعاش**.

ينصح علماء النفس في حالات التعرض لاضطراب ما بعد الصدمة (3) **أهالي** الأطفال (5) المتضررين (2) أو المعرّضين لصدمات نفسية (3) بعدة أساليب لمواجهة الأعراض (3) و (1) **دعم أطفالهم** في الأوقات العصيبة (1+2+5)، و (1) **تشجيعهم** على (1) **التعبير** عن (1) **مشاعرهم** بشكل واضح (2) وعدم كبّتها (3). كما (1) **تشير الأبحاث** إلى (1) أن (1) **التعامل** مع (1) **الأعراض** يكون (1) عند (1) **حدوثها** وخلال (1) **أول فترة**.

ينصح الخبراء الأهالي (3 - إعادة كتابة الفاعل والمفعول به حيث أنّ المعنى واضح) **بالاستماع** **لأطفالهم** والسماح لهم بتغيير مشاعرهم (3 - وصف للجملة التالية وهي أوضح) و (1) **تفهم** **مراحل الحزن والغضب** (2) و (1) **مشاركة المشاعر** و (1) **التماسك أمامهم**، بالإضافة إلى (1) **إبعادهم** عن (1) **الأخبار** ومواقع التواصل (3) و (1) **إشعارهم بالأمان** وتشجيعهم على التعبير عن مشاعرهم بالطريقة التي تناسبهم (3).

Text B with bolded keywords:

في أعقاب **الزلازل** المدمر الذي ضرب جنوب شرقي **تركيا** وشمال **سوريا**، **يعيش الناجون** منه **اضطرابات نفسية** عميقة. فمنذ وقوع الزلازل، **يرى العديد** منهم أن **في أي لحظة يمكن أن يعاد سيناريو الزلازل**، وكل شخص معرّض لاضطرابات نفسية معيّنة بعد خوض تجربة مروعة أو صادمة.

وحذرت منظمة الأمم المتحدة للطفولة "**اليونيسف**" من أن **ملايين الأطفال بحاجة** ماسة إلى **الدعم الإنساني**. **اضطراب ما بعد الصدمة** هو **مصطلح** يتضمن **الآثار النفسية** على من عاش **كارثة** أو **حادثة** ما سببت له صدمة.

قد **تشمل الأعراض إعادة ذكريات الماضي والكوابيس والقلق الشديد**، بالإضافة إلى **أفكار لا يمكن السيطرة عليها** حول الحدث، وقد **تظهر الأعراض جسدياً** مثل **إيجاد صعوبة في النوم والتعرق** والشعور **بآلام في الجسم والغثيان والارتعاش**.

ينصح علماء النفس في حالات التعرض لاضطراب ما بعد الصدمة **أهالي** الأطفال المتضررين أو المعرّضين لصدّات نفسية بعدة أساليب لمواجهة الأعراض و**دعم أطفالهم** في الأوقات العصيبة، و**تشجيعهم على التعبير عن مشاعرهم** بشكل واضح وعدم كبّتها. كما **تشير الأبحاث** إلى أن **التعامل مع الأعراض** يكون عند **حدوثها** وخلال **أول فترة**.

ينصح الخبراء الأهالي بالاستماع لأطفالهم والسماح لهم بتغيير مشاعرهم وتفهم مراحل الحزن والغضب ومشاركة المشاعر والتماسك أمامهم، بالإضافة إلى **إبعادهم عن الأخبار** ومواقع التواصل و**إشعارهم بالأمان** وتشجيعهم على التعبير عن مشاعرهم بالطريقة التي تناسبهم.

Text B with unbolded keywords:

في أعقاب الزلزال المدمر الذي ضرب جنوب شرقي تركيا وشمال سوريا، يعيش الناجون منه اضطرابات نفسية عميقة. فمنذ وقوع الزلزال، يرى العديد منهم أن في أي لحظة يمكن أن يعاد سيناريو الزلزال، وكل شخص معرّض لاضطرابات نفسية معيّنة بعد خوض تجربة مروعة أو صادمة.

وحذرت منظمة الأمم المتحدة للطفولة "اليونيسف" من أن ملايين الأطفال بحاجة ماسة إلى الدعم الإنساني. اضطراب ما بعد الصدمة هو مصطلح يتضمن الآثار النفسية على من عاش كارثة أو حادثة ما سببت له صدمة.

قد تشمل الأعراض إعادة ذكريات الماضي والكوابيس والقلق الشديد، بالإضافة إلى أفكار لا يمكن السيطرة عليها حول الحدث، وقد تظهر الأعراض جسدياً مثل إيجاد صعوبة في النوم والتعرق والشعور بآلام في الجسم والغثيان والارتعاش.

ينصح علماء النفس في حالات التعرض لاضطراب ما بعد الصدمة أهالي الأطفال المتضررين أو المعرّضين لصدمات نفسية بعدة أساليب لمواجهة الأعراض ودعم أطفالهم في الأوقات العصيبة، وتشجيعهم على التعبير عن مشاعرهم بشكل واضح وعدم كبثها. كما تشير الأبحاث إلى أن التعامل مع الأعراض يكون عند حدوثها وخلال أول فترة.

ينصح الخبراء الأهالي بالاستماع لأطفالهم والسماح لهم بتغيير مشاعرهم وتفهم مراحل الحزن والغضب ومشاركة المشاعر والتماسك أمامهم، بالإضافة إلى إبعادهم عن الأخبار ومواقع التواصل وإشعارهم بالأمان وتشجيعهم على التعبير عن مشاعرهم بالطريقة التي تناسبهم.

Comprehension Questions for Text B:

● سؤال عام:

○ ما هي إحدى أعراض الصدمة التي تظهر على المتضررين من الزلزال؟

- النوم لساعات طويلة
- الصداع المستمر
- الغثيان المتواصل
- فقدان الإحساس بالعضلات

● سؤال خاص:

○ كم بلغ عدد الأطفال الذين هم بحاجة ماسة للدعم النفسي؟

- أكثر من ألف طفل
- أكثر من عشرة آلاف طفل
- أكثر من مئة ألف طفل
- أكثر من مليون طفل

Open-ended questions:

- (English) Which text did you prefer to read more & why? (With bolded words or without bolded words)

• أي نص تفضل قراءته برأيك ولماذا؟ (مع الكلمات السميكة أو بدون الكلمات السميكة)

- (English) Did you note a change in ‘focus’/ ‘level of focus’ while reading the two texts?
Which was better?

• هل لاحظت تغييرًا في التركيز خلال قراءة النصين؟ أيهما أفضل؟

IRB Approval:



Case# 2022-2023-192

**To: Marwah Khost
Raghda El Essawi
Sara Tarek**

**From: Heba Kotb Chair of the IRB
Date 9/3/2023**

Re: IRB approval

This is to inform you that I reviewed your revised research proposal entitled

“The influence of bolded keywords in digital news texts on reading speed and comprehension for Arabic Heritage Language Learners”

It required consultation with the IRB under the "expedited" category. As you are aware, there were minor revisions to the original proposal, but your new version addresses these concerns successfully. Your proposal used appropriate procedures to minimize risks to human subjects and that adequate provision was made for confidentiality and data anonymity of participants in any published record. I believe you will also make adequate provision for obtaining informed consent of the participants.

This approval letter was issued under the assumption that you have not started data collection for your research project. Any data collected before receiving this letter could not be used since this is a violation of the IRB policy.

Please note that IRB approval does not automatically ensure approval by CAPMAS, an Egyptian government agency responsible for approving some types of off-campus research. CAPMAS issues are handled at AUC by the office of the University Counsellor. The IRB is not in a position to offer any opinion on CAPMAS issues, and takes no responsibility for obtaining CAPMAS approval.

This approval is valid for only one year. In case you have not finished data collection within a year, you need to apply for an extension.

Thank you and good luck.

A small rectangular box containing a handwritten signature in black ink, which appears to read "H. Kotb".

Heba Kotb
IRB chair, The American University in Cairo
2078 HUSS Building
T: 02-26151857
Email: hebakotb@aucegypt.edu

Institutional Review Board
The American University in
Cairo
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tel 20.2.2615.1000
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Consent Form:

استمارة موافقة مسبقة للمشاركة في دراسة بحثية

عنوان البحث: تجربة بحثية لزيادة سرعة القراءة ودعم فهم للنصوص العربية

الباحثة الرئيسية: مروة خوست، طالبة ماجستير في تعليم اللغة العربية للأجانب - الجامعة الأمريكية في القاهرة
البريد الإلكتروني: marwahkhost@aucegypt.edu
الهاتف: +20111116396

أنت مدعوة للمشاركة في دراسة بحثية متعلقة بسرعة القراءة والفهم لنصوص الأخبار باللغة العربية.

هدف الدراسة هو إيجاد طريقة لإكمال عملية قراءة نصوص الأخبار باللغة العربية بطريقة أسهل وأسلس.

نتائج البحث ستُنشر في البحث الذي أقوم به حالياً للتخرج من قسم الماجستير في تعليم اللغة العربية للأجانب.

المدة المتوقعة للمشاركة في هذا البحث هي حوالي 20-30 دقيقة أو أقل.

إجراءات الدراسة تشتمل على قراءة نصين مختلفين من شاشة الحاسوب المتواجد في الغرفة، ومن ثمّ الإجابة عن بضعة أسئلة باللغة العربية.

الاستفادة المتوقعة من المشاركة في البحث: إن المساهمة الفردية في هذا البحث مهمة جداً فهي ستبرهن آلية الفكرة وما إن كانت لها أهمية في نتائج البحث وزيادة كفاءة عملية القراءة أم لا، وهذه التقنية قد تتوسع لتفيد عدد أكبر من متحدثي اللغة العربية حول العالم.

السرية واحترام الخصوصية: المعلومات التي ستدلى بها في هذا البحث سوف تكون سرّية، ولن يتم ذكر الأسماء أو أي تفاصيل خاصة بكل شخص في البحث.

أي أسئلة متعلقة بهذه الدراسة أو حقوق المشاركين فيها أو عند حدوث أي إصابات ناتجة عن هذه المشاركة يجب أن توجه إلى مروة خوست، وهي القائمة على المشروع البحثي، والتواصل معها عبر الرقم: +20111116396

إن المشاركة في هذه الدراسة ما هي إلا عمل تطوعي، ولا يتضمن الامتناع عن المشاركة أي عقوبات أو فقدان لمزايا أخرى. ويمكنك أيضاً التوقف عن المشاركة في أي وقت من دون عقوبة أو فقدان لهذه المزايا.

التوقيع.....:

اسم المشارك.....:

التاريخ...../...../.....:

Post on Facebook

مرحباً! أنا طالبة ماجستير في تعليم اللغة العربية للأجانب وأجري حالياً دراسة هدفها إيجاد طريقة للقيام بعملية قراءة نصوص الأخبار باللغة العربية بطريقة أسهل وأسلس. مدة الدراسة عشر دقائق، وتضم قراءة لنصين باللغة العربية مع بعض الأسئلة.

هل عندك وقت للمشاركة في الدراسة خلال الأسبوع في الجامعة؟ الدراسة تضم طلاب الجامعة الأمريكية، من المصريين، درسوا في مدارس دولية في مصر قبل دخولهم الجامعة. مستواهم في اللغة: يمكنهم قراءة النصوص الإخبارية الطويلة باللغة العربية. شكراً ليكم!