

Doctoral (PhD) Dissertation



**SECOND LANGUAGE LEARNERS' STRATEGIES OF READING
MULTIMODAL TEXTS:
THE EFFECT OF SOCIAL MEDIA USE ON READING**

By

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1. Introduction

1.1. Multimodality

Multimodality is a concept that has received increasing attention in recent years, particularly in the fields of linguistics, communication, and media studies. It refers to the use of multiple modes of communication to convey meaning, including text, image, sound, and gesture (Kress & van Leeuwen, 2001). According to Kress and van Leeuwen (2001), multimodal communication can be divided into three categories: linguistic, visual, and audio modes. The linguistic mode includes spoken and written language, and is the most commonly used mode of communication. However, it is not always sufficient to convey complex or abstract concepts, as it relies heavily on syntax and vocabulary. The visual mode includes still and moving images, and is particularly useful for conveying spatial and temporal relationships, as well as emotional and affective meanings (Jewitt, 2009). The audio mode includes sound and music, and can enhance the emotional impact of a message, as well as provide additional information or cues.

One of the key advantages of multimodal communication is its ability to convey complex ideas more effectively. By using multiple modes of communication, a message can be made more engaging, interactive, and immersive, which can help the audience understand and remember the information better (Machin, 2007). This is particularly important in the age of digital communication, where people are constantly bombarded with information and have shorter attention spans.

Multimodality also has implications for language learning and teaching, as it can provide a more comprehensive and authentic learning experience for learners and enhance learners' motivation, engagement, and comprehension (Varaporn & Sitthitikul, 2019)

However, multimodality also presents challenges, such as the need for careful consideration of how different modes interact and contribute to the overall message, and the potential for information overload or confusion if not executed effectively (Jewitt, 2009). In addition, the interpretation of multimodal messages can vary depending on the cultural and social contexts of the audience.

In sum, multimodality is a powerful tool for communication, with its ability to convey complex ideas and engage audiences in more meaningful ways. Understanding the principles and strategies of multimodal communication can help teachers and material developers convey their messages more effectively and engage with their language learners in more meaningful ways.

As the exploration of multimodality comes to a close, it becomes evident that the impact of various modes of communication goes beyond traditional channels. The subsequent section discusses an intersection where multimodality converges with the powerful realm of social media. Therefore, the subsequent section delves into the pros and cons of social media as a multimodal platform in the era of technology.

1.2. Reading habits in the age of technology

The advent of technology has led to a significant transformation in the way people read and consume information. The traditional means of reading, which involved printed materials such as books and newspapers, have been replaced by digital technologies, including e-books, online articles, and blogs.

One of the most significant changes that technology has brought about is the ease of access to information. The internet has revolutionized the way we gather information, and we can access a vast variety of resources within seconds which has resulted in a preference for digital media over printed materials. Digital texts offer readers greater convenience and accessibility. Digital texts can be accessed from anywhere and at any time, and readers can carry hundreds of books with them on a single device. Moreover, digital texts often come with added features such as searchability, hyperlinks, and annotations, which can enhance the reading experience for some readers (Mangen et al., 2013).

The emergence of social media platforms has had a significant impact on reading habits in the digital age. Social media now serves as a prominent source of information and news worldwide. The ease of information sharing on these platforms has resulted in a higher consumption of concise articles and quick updates. Furthermore, the integration of various communication modes, such as text, images, videos, and audio, has made social media an alluring space for users. This combination of multimodality and social media has surpassed traditional boundaries, offering an immersive experience where individuals can express themselves more deeply and establish richer connections.

However, the shift to digital texts has also raised concerns about the impact on readers' comprehension and attention. Some studies have suggested that people tend to skim and scan digital texts rather than reading them thoroughly (Mangen et al., 2013). Furthermore, the constant distractions and interruptions that come with digital devices may lead to a decrease in reading comprehension and retention (Carr, 2011). Therefore, it is important for readers to be mindful of

their reading habits and to develop strategies to minimize distractions and enhance their comprehension of digital texts.

It is important to note that not everyone has embraced digital technologies, and some individuals still prefer traditional print media. The preference for printed materials may be due to a variety of reasons, including the tactile experience of holding a book or the lack of distractions that come with digital reading.

The advent of technology has revolutionized reading and information consumption, replacing traditional print media with digital technologies. The ease of access to vast online resources has encouraged a preference for digital media, offering convenience, accessibility, and enhanced features. Social media platforms have further reshaped reading habits, allowing for the consumption of concise content and fostering immersive experiences through multimodal communication. However, concerns about comprehension and distractions in digital reading persist, necessitating mindful reading strategies. While digital technologies dominate, it's important to acknowledge that some individuals still value the tangible and focused experience provided by traditional print media. Taking into account this foundation, my research aims to explore multimodal reading strategies within the context of social media use.

1.3. Background of the research

Teaching second language learners of different age groups can be challenging, as each group brings unique characteristics, learning styles, and preferences. As a language teacher with years of experience, I have observed significant differences in the way adult learners and younger learners approach their language learning journey. One of the most noticeable differences is their reading habits, particularly when it comes to reading multimodal texts.

Adult learners typically prefer to use EFL/ESL textbooks and classroom activities as their primary learning resources, and they tend to be more focused and attentive during class time. Adult learners are generally more motivated to learn a second language, and they understand the importance of reading and comprehending different types of texts, including those that are multimodal.

On the other hand, younger learners, particularly teenagers and young adults, tend to have a more relaxed and casual approach to language learning. They are often more tech-savvy and spend a significant amount of time on their mobile phones, browsing different social media platforms,

and interacting with various forms of digital content. During language classes, they often finish their tasks quickly and start using their mobile phones for entertainment.

These observations led me to realize the importance of studying L2 learners' reading habits and multimodal reading strategies in different age groups. Recognizing this importance can help language teachers develop effective teaching strategies that cater to the needs and interests of their learners. Therefore, I decided to quantitatively and qualitatively investigate the reading habits and modal preferences of L2 learners of different age groups and the impact of digital technologies, particularly social media platforms on their reading habits.

I believe that this research will contribute to the understanding of how language learners approach reading multimodal texts and provide valuable insights for language teachers and curriculum developers in developing effective teaching strategies. By shedding light on the reading practices of language learners and exploring the intricacies of multimodal texts, this study aims to contribute to the broader goal of enhancing language education. The forthcoming section will present an overview of the precise goals and organization of this dissertation, laying the foundation for a comprehensive exploration of this significant subject matter.

1.4. The goal and the structure of the dissertation

The advent of technology and the internet has transformed our lives, and social media platforms have become ubiquitous. With the proliferation of visual displays in our daily life, it is crucial to examine how second language (L2) learners read and comprehend multimodal texts. Reading multimodal texts involves processing different modes of semiotics, and it requires specific strategies that L2 learners must learn to navigate effectively. Moreover, the constant use of social media has altered our readings habits dramatically. Therefore, this dissertation seeks to investigate the reading habits and modal preferences of second language learners in different age groups and examine how they read multimodal texts. Exploring this topic might enhance our understanding of how L2 learners can develop effective strategies for reading multimodal texts.

The goals of the pilot study are as follows:

- 1- to investigate the reading habits and modal preference of Hungarian L2 learners of English.
- 2- to see the effect of age on the reading habits and modal preference of Hungarian L2 learners of English.
- 3- to explore how Hungarian L2 learners of English read multimodal texts.
- 4- to find out how intersemiotic relations affect modal preferences.

Apart from the introductory section that lays the groundwork for the forthcoming chapters, the dissertation comprises six chapters. Chapter 2 provides a comprehensive review of relevant literature, presenting theoretical positions that lay the foundation for the research. It establishes the theoretical framework supporting the research questions, setting the stage for the empirical investigation that follows. In Chapter 3 of the dissertation, the research instruments and methodology are presented. This chapter describes the participants and the research tools utilized, which include the reading habit questionnaire and the multimodal reading test. The subsequent chapter, Chapter 4, details the findings of the study in the order of the research questions. Chapter 5 compares the results of the current study to those of prior research. In Chapter 6, the multimodal reading test's validity and reliability are examined, and guidelines are presented for its future enhancement and development. Finally, Chapter 7 presents the conclusion of the study, including an identification of its limitations, and proposes future directions for research.

2. Methodology

This pilot study employs a mixed-method approach (online and eye-tracking experiments) to investigate reading habits, modal preferences, and multimodal strategies among different age groups of second language learners (L2). Seventy Hungarian L2 learners with B1 English language proficiency attended the online experiment to read and respond to the multimodal texts. Each task item included a multimodal text and a question with two answers, which represented either the visual or verbal information in the multimodal text. A reading habit questionnaire and follow-up questions were also used to collect information concerning the participant's reading habits and their opinions towards multimodal tests, respectively. In order to investigate the effect of age on the participants' reading habits and modal preferences, the population was divided into Group A (13-29) and B (31-46). The eye-tracking experiment seeks to examine second language learners' cognitive processes while reading multimodal texts. Eye movements were recorded during Hungarian L2 learners' (N=9) processing of multimodal texts in order to examine their gaze patterns.

3. Methods of data analysis

Altogether, there are two experiments which shape this dissertation. On the one hand, the online experiment aims to explore L2 learners' reading habits and their modal preferences. With this aim in view, descriptive statistics (e.g., mean, frequency and standard deviation) were used to examine all the L2 learners' responses to the online reading habit questionnaire, multimodal reading test and

follow-up questions. The reading and response durations of the online multimodal reading test were also calculated. Paired samples t-tests were conducted to compare the means of visual and verbal responses and reading and response durations. Besides, a Pearson correlation coefficient was computed to assess the linear relationship between the reading duration and the type of responses (visual or verbal). The first question in the follow-up test (Did the pictures help you read and understand the texts better?) includes two responses (Yes and No), A Chi-square test was thus done to examine the relationship between 'Yes' and 'No' responses. Moreover, an independent samples t-test was run to see if the means of visual/verbal responses and reading/response durations were significantly different in 'Yes' and 'No' responses. The second question (Did you mostly rely on the pictures or the texts to answer the questions?) includes three responses (Picture, Text, Both). In order to compare the distribution of the number of participants who selected 'Pictures', 'Text' or 'Both', a Chi-square goodness-of-fit test was run. Additionally, a one-way ANOVA was performed to compare the effect of 'Picture', 'Text' and 'Both' answers on the verbal and visual responses, and reading and response time. To address the uneven sample sizes, a Gabriel post-hoc test was conducted to identify the specific pairwise comparisons of means that significantly contributed to the overall difference.

The online experiment also attempts to investigate L2 learners' reading habits and multimodal reading in Group A (13-30) and B (31-46). Descriptive statistics were used to examine the L2 learners' responses to the online reading habit questionnaire, multimodal reading test and follow-up questions in Group A and B. Furthermore, an independent-samples Mann-Whitney U test was run to compare the reading habits in Group A and B. Furthermore, A Pearson correlation coefficient was run to assess the linear relationship between the age and the reading and response durations in Group A and B. An independent samples t-test was also used to see if the means of visual/verbal responses and reading/response durations are significantly different between Group A and B. Moreover, an independent samples t-test was conducted to compare the means of 'Yes' and 'No' responses to the first follow-up question in Group A and B. A Chi-square test was done to investigate the relationship between 'Pictures', 'Text' and 'Both' responses in the second follow-up question in Group A and B.

In order to locate the specific differences among the age groups, the population was divided into 4 age groups of adolescents (13-17 years old) who were school students, young adults (24-29 years old) who had recently left school and were likely to study at university, adults (31-37 years old)

who were likely in the process of completing their education and establishing a stable lifestyle, and the middle-aged (39-46 years old) who were reaching or were already in their middle age. First, a one-way ANOVA was performed to see if age had a measurable effect on the reading and response durations and visual/verbal responses between at least two age groups. Later, due to the unequal sample sizes, a Gabriel post-hoc test was run to determine which pairwise comparison of means contributed to the overall significant difference.

The eye-tracking experiment aims to examine the L2 learners' cognitive processes while reading multimodal texts. Descriptive statistics and Pearson correlation coefficient were run to report on eye measurements and their possible linear associations. Paired samples t-tests were run to compare the means of eye-measurements in the image and text.

Finally, in order to integrate the results from both experiments, the descriptive statistics and attentional allocations and scanpath graphs of 6 multimodal texts were used to discuss how the intersemiotic interactions encourage visual or verbal responses. Two multimodal texts elicited strong visual responses, while two other multimodal texts evoked substantial verbal responses. The participants rather relied on their background knowledge to provide answers for two other sets of multimodal texts. Paired samples t-tests were run to compare the means of eye-measurements in the image and text of these 3 sets of multimodal texts. The Chi-Square test was also used to examine if the visual and verbal responses to the multimodal texts in the online experiment were related.

4. Results and discussion

The results of the online reading habit questionnaire show that the participants were mostly involved in reading social media than print and electronic media. The findings from the online multimodal reading test also reveal that the readers preferred verbal over visual responses. And the longer reading duration caused higher visual responses. With regard to the follow-up questions, the majority of the participants perceived images as beneficial for their reading comprehension, leading to an increase in visual responses. Additionally, the participants found the combination of visual and verbal discourse more advantageous than each mode individually, resulting in longer reading durations. Furthermore, the participants who regarded 'text' as helpful predominantly selected verbal responses, while those who considered 'image' as beneficial tended to choose more visual responses.

Considering the age and the reading habits, Group A were more involved in print and electronic books and comics while Group B read print and electronic newspapers and magazines more

frequently. Group A used social media more regularly to watch videos and keep in touch, read pictures, and texts, however, Group B used the social media to keep in touch, watch the video, read text and pictures, in descending order. However, the Mann-Whitney U test findings indicated a statistically significant distinction solely in reading pictures and watching videos on social media when comparing Group A and Group B. With regard to the age and multimodal reading, Group B spent longer time reading and responding to the multimodal texts and preferred visual over verbal responses. Conversely, Group A selected verbal responses more frequently. Moreover, there is a tendency that the reading and response speed increased from adolescence to young adulthood, however, it started to decrease towards the middle age. The visual responses also increased as the participants aged. As for the follow-up questions, Group B believed that images and their interactions with the verbal discourse improved the reading comprehension while Group A found verbal information more helpful.

The findings from the eye-tracking experiment show that the participants spent most of their time reading the verbal stimulus. The texts with higher word counts enjoyed longer complete fixation time, a greater number of fixations and regressions on the text, and a delay in the first fixation on the image, which might indicate that the participants preferred to have a holistic overview of the text before fixating on the image. Visual stimuli along with regressions on the text might help the readers to hold and store the information in their short-term memory or overcome the difficulty of the text. Moreover, visual-verbal relations (e.g., text-subordinate-to-image and image-subordinate-to-text, image-text-complementary) might determine the degree of the participants' involvement with the image.

To summarize, extended fixations might suggest that information is either engaging due to visual complexity or confusing and demanding for readers to process. This could be also interpreted as an effort to integrate text and image and construct a visual-verbal mental model. Additionally, a greater number of fixations on image and text likely indicates readers' attempts to integrate information from both modes, accompanied by increased cognitive effort. Schwonke et al (2009) argue that the frequency of transitions between image and text serves as an indicator of integrative effort, even if not necessarily successful or informed.

The research conducted by O'Halloran (2011) emphasizes the complexities introduced by multimodality in communication, as it brings forth diverse semiotic resources that individuals must navigate and comprehend. Additionally, studies by Kress and van Leeuwen (2001) highlight the

unique affordances and constraints associated with different modes, further complicating the communication process. Therefore, while multimodality presents the potential for enhanced and engaging communication experiences, it also presents challenges in terms of information processing, interpretation, and the coordination of multiple modalities.

5. Limitations of the study

It is important to acknowledge the limitations of the present study. Only nine participants attended the eye-tracking experiment based on convenience sampling and voluntary response sampling because the research was conducted during COVID-19 lockdown, when in-person and on-campus activities and the access to the laboratory equipment were strictly limited. When the lockdown was eased, six more participants were selected for the eye-tracking experiment, however, the eye-tracker was not available because either it was being used by other departments of university for their research or it wasn't working stably. When I finally managed to make a two-week appointment to use the eye-tracker, the Faculty of Engineering and Information Technology at the University of Pannonia announced that the eye-tracker was not accessible anymore due to software errors and bugs.

Moreover, a set of print standardized Pannon language exam tests was initially selected as the language proficiency test, which was handed in by the teachers of a secondary school in Veszprém to 40 L2 students before COVID-19 started. Twenty eight participants received the passing score for the eye-tracking experiment. However, due to COVID-19 restrictions and school closures, onsite access to the students and collecting further data were not possible anymore, therefore, they were excluded from the final population.

Two different populations were used for data collection. When the first selected population (28 participants) was excluded from the research, I contacted several other secondary schools in Veszprém to recruit more participants. Nine secondary school students finally attended the online experiment, however, the COVID-19 pandemic created serious difficulties recruiting secondary school participants, I thus decided to reformulate the research questions, alternate the subject parameters and enlist the students at the language school where I worked and could easily access. Although there were two different EFL proficiency tests (Euroexam test and placement test) for two different populations (secondary school students and language school students), the data of nine secondary school students were not excluded from the final research population because I

believed that they could provide an invaluable insight into school students' reading habits and modal preferences and generate constructive ideas for future research.

Due to the data collection being conducted exclusively online during the COVID-19 lockdown, the standardized Pannon language test was not utilized as the English language proficiency test. The Pannon Language Examination Center declined permission to administer the test online due to concerns regarding data protection, access, and security. Initially, I chose the Pannon Language Exam due to its inclusion of multiple reading texts that aligned with the objectives of my research. Furthermore, Hungarian universities and employers acknowledge this examination as a reliable indication of language proficiency. Additionally, the test adhered to standardized criteria, ensuring consistency and fairness.

The aforementioned external limitations imposed on my pre-existing research plan negatively impacted the research progress for almost a year and a half and consequently resulted in frequently reformulating the research questions, restructuring the research plan and procedure and altering the subject parameters.

6. Implications of the research

Textbook developers, web and app designers and teachers can benefit from the present research. Textbook developers need to integrate multimodal texts with different degrees of redundancy to provoke different interpretations from L2 learners, engage them in multimodal thinking and cognitive flexibility and create multidirectional entry points into textual analyses and interpretations (Ajayi, 2012). Web and app designers can also adopt multimodal input with different intermodal relations. While, at the beginning of the learning process, redundancy in multimodal texts might provide a firm ground for L2 learners to learn, for instance, vocabulary, semantic gaps can later create opportunities for them to practice the knowledge and increase its retention. Moreover, teachers can effectively incorporate different modes in teaching materials to develop student's engagement, interpretation and attention. Duplications and semantic gaps in multimodal texts could scaffold language learning and develop learners' critical thinking and engagement, respectively. Although the use of technology may facilitate teaching and learning in language classrooms (Derakhshan & Hasanabbasi, 2015), the mere induction of social media does not bring about valuable learning experience. In fact, teachers need to use the available ESL reference resources to plan and design collaborative activities on social media, which engage the

learners in language experience both effectively and cognitively and improve their communicative competence and purposes (Nur & Syarifuddin, 2018). Educational institutions should also consider the modification of ESL/EFL curricula and the incorporation of social media into education, hoping to offer more meaningful engagement and enriched learning experience to deal with students with different needs and preferences.

Different reading habits and modal preferences among L2 learners of different age ranges may encourage teachers to modify their approaches according to students' particular needs and interests and tailor teaching materials and assignments in various formats to support their students during learning processes and completion of assignments. For instance, teaching genres as a particular type of writing, the teacher may assign young adults to look into trendy comics on social media while middle-aged adults can explore electronic newspaper genres.

The findings from this research also demonstrate a clear gap between inside and outside school world. While the reading habit questionnaire shows the students' favor for social media, their responses to the multimodal texts and the eye-tracking experiment evidence that they relied on text more often. Therefore, in order to improve multimodal literacy at schools the reconceptualization of assessment and the incorporation of multimodal tasks, which encourage students to display metacognitive and multimodal literacy skills, are recommended. Teachers and curriculum designers can develop meaningful multimodal assessment tools and create attractive and useful interactive materials, which maximize learning potentials.

The present research can help material and textbook developers, web and app designers and teachers to analyze available multimodal materials in educational settings to see if they are pacing up with the current needs of students and help develop student's engagement, interpretation and attention through an effective combination of semiotic modes in teaching materials. In sum, the present piece of research emphasizes that the age of technology has changed the reading habits. While it is important to recognize the importance of traditional reading habits on second language proficiency, it is essential for teachers and curriculum designers to listen, learn and adjust their approach to pace up with the changing needs of students, tailor the curricula, teaching, learning and assessment materials, and assignments accordingly and design lessons which lend themselves to different types of learning.

7. Future directions

Only nine participants attended the eye-tracking experiment because the research was conducted during COVID-19 lockdown. Future research could include a larger sample of participants to investigate, refine and generalize our findings related to L2 learners' multimodal reading processes. Moreover, the present research is about the effect of social media on reading multimodal texts. And since using the internet involves reading a lot of creative and eye-catching visual effects in wide varieties of formats, lengths and topics, the multimodal reading test includes texts with varied image-text relations. Further research is required to focus on only two image-text relations (e.g., image-more-general-than-text and text-more-general-than image) and include more trial per relation.

Besides, this paper only examined the modal preferences of the participants and their mental representations in the online experiment. Further research could explore which image-text relation (e.g., image-subordinate-to-text or text-subordinate-to-image) develops a better comprehension of the multimodal texts.

Furthermore, the present research only presents the preliminary results of the multimodal reading test from the pilot study. The findings from the online and eye-tracking experiments could be used to modify and validate the present multimodal reading test for future replications. In addition, eye-tracking experiments, read-aloud protocols and interviews may provide further detailed data about L2 learners' cognitive processes while reading and responding to multimodal texts. This valuable information may help researchers investigate how readers deal with, recall and retrieve multimodal information.

Further research could also explore the broader impact of autonomous learning on individuals' engagement with the external environment, as well as its influence on their motivation, reading habits, and preferred modes of learning. Investigating these aspects can shed light on the potential implications for future educational studies.

To enhance the validity and potentially the reliability of the research, an option could be to replicate the study using open-ended questions within the online multimodal reading test. Instructing participants to respond with brief and straightforward sentences would contribute to the overall robustness of the findings.

Furthermore, this study could be replicated with L2 Learners from different countries to investigate the effect of culture on their multimodal reading. More research could be also done to examine which modal preferences (visual or verbal) lead to a better reading comprehension

Finally yet importantly, more research is required to investigate the drawbacks and benefits of different research instruments and explore which combinations of methods demonstrate better and more comprehensive results. We strongly believe that collecting further empirical evidence contributes to developing a more comprehensive and efficient model of L2 multimodal language learning environment.

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