Eye-Tracking A2 Reading in Teaching Turkish as a Second Language

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ABSTRACT
The Common European Framework of Reference for Languages (CEFR) is widely used in the design of curricula and materials for Teaching Turkish as a Second Language (TTSL), yet concerns remain about the consistency of text difficulty across CEFR-labeled materials. This study examined 31 B1-level international learners of Turkish as they read four CEFR-labeled A2 reading texts from Hitit, İstanbul, Gazi, and Yunus Emre coursebooks. Eye movements were recorded using a Tobii Pro X2 60 Hz eye tracker, measuring reading time, fixation duration, fixation count, regressive saccades, and return sweeps, while comprehension was assessed through six-item multiple-choice tests administered after each reading. The results revealed significant variation among texts: Hitit and Gazi elicited shorter reading times, fewer fixations, and higher comprehension scores, whereas İstanbul and Yunus Emre required longer processing times, more regressions, and produced lower comprehension outcomes. Gender differences were minor, but the reading direction of the native language significantly affected processing efficiency, with left-to-right readers outperforming right-to-left readers. These findings demonstrate that CEFR-labeled A2 texts differ substantially in cognitive demand, challenging the assumption of uniformity across TTSL coursebooks. The study highlights the value of eye-tracking as an objective method for evaluating text difficulty and recommends its integration into material development and assessment practices to ensure equitable and level-appropriate learning experiences for TTSL learners.
Keywords: CEFR, Teaching Turkish as a Second Language (TTSL), eye-tracking technology, cognitive load, reading comprehension, second language reading, language assessment, coursebook evaluation

1. INTRODUCTION

The Common European Framework of Reference for Languages (CEFR, 2018) has emerged as a foundational guide for curriculum design, assessment, and instructional material development across Europe, including efforts related to Teaching Turkish as a Second Language (TTSL). As CEFR-based alignment becomes increasingly central to textbook development, ensuring the internal consistency and cognitive accessibility of materials becomes essential. This is particularly true for reading passages, which are key instruments for developing and assessing learners' comprehension skills. While publishers of TTSL coursebooks often claim CEFR alignment, it remains unclear whether reading passages across textbooks assigned the same CEFR level genuinely elicit comparable cognitive demands in learners. Traditional methods of evaluating reading comprehension, such as questionnaires and self-report instruments, offer limited insight into the real-time cognitive processes involved during reading. In contrast, eye-tracking methodology presents a novel, objective, and data-rich alternative that captures visual attention and cognitive load through measurable indicators such as fixation duration, saccadic movements, and gaze patterns. Based on the Eye-Mind Hypothesis (Just & Carpenter, 1980), this methodology enables researchers to assess where and for how long learners focus their attention, thereby revealing discrepancies between the intended difficulty level of a text and the actual cognitive processing it requires. The present study employs eye-tracking technology to benchmark the reading passages of four widely used TTSL coursebooks— Yeni Hitit Yabancılar için Türkçe A2 Ders Kitabı (Hitit), Gazi Üniversitesi Yabancılar için Türkçe A2 Ders Kitabı (Gazi), İstanbul Yabancılar için Türkçe A2 Ders Kitabı (İstanbul) and Yedi İklim Türkçe A2 Ders Kitabı (Yunus Emre)— all designated as A2-level by their publishers. Its primary objective is to determine whether these texts trigger comparable levels of cognitive effort and comprehension performance among learners. By focusing on reading time, fixation measures, and comprehension outcomes, the study contributes to ongoing debates about CEFR validity in Turkish language education and aims to provide empirical evidence for the alignment—or misalignment—of A2 reading materials in TTSL.

2. LITERATURE REVIEW

Research into visual attention and eye movement patterns during reading has a history spanning more than a century. Early efforts, which relied on mechanical devices and introspective self-reporting (Leggett, 2010), gradually gave way to technologically advanced methods capable of capturing real-time reading behavior. The advent of modern eye-tracking systems marked a significant shift in psycholinguistics and cognitive science, moving from indirect measurements of comprehension to the direct observation of how readers process written text. Eye tracking provides detailed insights into how individuals engage with written material by recording

fixations—moments when the eyes pause to process text—along with saccades, regressive saccades, and return sweeps. Central to this approach is the Eye-Mind Hypothesis proposed by Just and Carpenter (1980), which posits that eye movements are closely tied to cognitive processing, such that when the eye fixates on a word or phrase, the reader is simultaneously interpreting it. Prolonged fixations and frequent regressions typically indicate an increased cognitive load or a breakdown in comprehension, while fluent readers exhibit shorter and more efficient fixations (Rayner, 1998; Lai et al., 2013).

Traditional approaches to reading comprehension, often dependent on post-reading assessments such as multiple-choice questions or written responses, are limited in their ability to capture the dynamic and moment-to-moment nature of reading. Eye-tracking addresses this gap by offering quantifiable metrics—such as fixation duration, gaze duration, time to first fixation, fixation count, and the frequency of regressive saccades—that reveal the cognitive effort required to process a given text (Goldberg & Kotval, 1999; Rayner & Duffy, 1986). Empirical studies consistently demonstrate that longer words, less frequent vocabulary, and unpredictable textual content result in extended fixation durations and more regressions (Inhoff & Radach, 1998; Rayner et al., 1996). These indicators provide an objective means of distinguishing between texts that may be labeled at the same proficiency level but vary considerably in actual processing difficulty. Theoretical frameworks in cognitive psychology further illuminate how readers make sense of texts. Van Dijk and Kintsch (1983) proposed that comprehension involves the construction of a mental model that integrates incoming textual information with the reader's existing knowledge base. This model was later developed by Khalifa and Weir (2009), who emphasized the interplay between linguistic input and higher-order cognitive strategies. Eye-tracking offers a unique window into these processes by capturing micro-level disruptions, strategic regressions, and rereading behaviors that reflect comprehension monitoring (Zwaan et al., 1995, 2008). More skilled readers often employ metacognitive strategies, observable in their eye movement patterns, such as selective regressions and clustered fixations, which indicate purposeful re-examination of key text segments (Rayner, 1986).

When applied to second language reading, eye-tracking proves especially valuable in distinguishing between linguistic proficiency and comprehension outcomes. Traditional comprehension questions may be influenced by test-taking strategies, guessing, or limited vocabulary knowledge, whereas eye-tracking provides behavioral evidence independent of these external factors. Indefrey (2006) and Roberts (2012) highlight the methodological advantage of this approach, while Rayner (2009) notes its particular relevance for second language research, where it can disentangle the complexities of non-native reading processes. Research has consistently shown that second language learners, especially those with lower proficiency, tend to exhibit longer fixations, more regressive saccades, and shorter forward saccades than native readers, indicating greater effort in decoding and integrating text (Foster et al., 2013; Rayner, 2009). Such findings underscore the sensitivity of eye-tracking measures in capturing subtle variations in reading behavior among learners of different backgrounds. Within the framework of the CEFR, the A2 level is defined by the ability to comprehend short, simple texts on familiar subjects, typically characterized by high-frequency vocabulary, straightforward syntax, and clear discourse organization. Learners at this level are expected to follow everyday narratives and informational texts with minimal difficulty. However, in practice, the alignment of TTSL coursebook texts with CEFR descriptors is not always consistent. Publishers may interpret the CEFR guidelines differently, leading to notable variation in the actual cognitive load demanded by texts labeled A2. The CEFR documentation (Council of Europe, 2018) emphasizes the importance of factors such as linguistic structure, genre, thematic relevance, and text length in determining appropriate reading material. Nevertheless, empirical studies, including the present one, show that without objective validation, level designations remain vulnerable to inconsistency, and learners may encounter texts that exceed the intended difficulty threshold. This highlights the need for evidence-based evaluation of reading materials in TTSL to ensure that learners are provided with content that truly reflects the CEFR-level expectations.

In light of these concerns, the current study adopts an eye-tracking methodology to examine the cognitive demands of A2-level texts drawn from widely used TTSL coursebooks. By analyzing learners' reading behavior and comprehension outcomes, the research seeks to determine whether these materials genuinely align with the CEFR descriptors. The following section outlines the research design, participants, materials, instruments, and procedures employed in conducting this investigation.

3. METHODOLOGY
This study was designed as a quantitative investigation to evaluate the cognitive processing demands of A2-level reading texts in TTSL. It was conducted within the framework of the Eye-Mind Hypothesis, which assumes that eye movements provide a reliable indicator of ongoing cognitive activity during reading (Just & Carpenter, 1980). The aim was to observe and analyze learners' reading behavior through eye-tracking technology and to measure comprehension performance in order to determine whether texts labeled as A2 by their publishers were consistent with the cognitive expectations of this proficiency level.

The participants of the study were international students who were enrolled in Turkish language courses at the B1 level. All participants had successfully completed the A2 level of instruction, making them an appropriate group to evaluate A2-level reading passages. Their language backgrounds were diverse, reflecting the multicultural and multilingual composition of typical TTSL classrooms. Participation was voluntary, and each participant signed a consent form before the study began. Ethical approval for the study was obtained from the relevant university ethics committee, ensuring that all procedures were carried out in accordance with established research standards. The reading materials consisted of four texts, each drawn from one of the most widely used TTSL coursebooks: Hitit, Gazi, İstanbul and Yunus Emre. Each text had been identified by its publisher as suitable for A2-level learners according to the CEFR standards. While the themes varied, the texts were comparable in type and intended reading level. The experimental setup utilized a Tobii remote eye-tracking system, which was calibrated for each participant prior to the reading task to ensure precision in measurement. The Tobii device allowed for unobtrusive data collection, as participants were not required to wear head-mounted equipment but could read in a natural posture. The system recorded a range of eye-movement metrics, including fixations (pauses of the eyes on a word or phrase where cognitive processing occurs), saccades (rapid movements between fixations), regressive saccades (backward movements indicating rereading or comprehension difficulty), and return sweeps (shifts from the end of one line of text to the beginning of the next). Visual representations of participants' gaze behavior, such as heat maps and gaze plots, were generated for each text to illustrate attention distribution and cognitive focus. During the experiment, each participant was seated in front of a monitor on which the reading texts were presented one at a time. The order of presentation was randomized to control for sequencing effects. Participants were instructed to read the passages at their own pace and as naturally as possible. Immediately after reading each text, they were given a six-item multiple-choice comprehension test specifically designed to reflect the CEFR A2-level descriptors. These tests assessed both literal understanding and inferential comprehension, providing an additional layer of data alongside the eye-tracking measures.

The data obtained included total reading time for each text, average and total fixation durations, the number of fixations and revisited fixations, regressive saccade counts, return sweep counts, and comprehension scores. Statistical analysis was performed using SPSS software. Descriptive statistics were first used to summarize the results, followed by inferential statistical tests, including analysis of variance (ANOVA) and independent samples t-tests, to determine significant differences between the texts and among participant groups. Pearson correlation analyses were also conducted to examine relationships between eye-tracking variables and comprehension outcomes. In addition, predictive modeling was applied to explore the possibility of estimating unknown values for certain texts based on the known data from others. This methodology ensured that the study combined both objective behavioral indicators of reading processes and direct measures of comprehension, allowing for a comprehensive evaluation of the cognitive demands imposed by A2-level TTSL coursebook texts.

4. RESULTS

The data collected from the eye-tracking experiment and comprehension tests were analyzed using SPSS. Descriptive statistics were calculated for each of the dependent variables, including reading time, fixation duration, fixation count, regressive saccades, return sweeps, and comprehension scores. Inferential analyses were performed using one-way analysis of variance (ANOVA) and independent samples t-tests to identify significant differences across the independent variables of text source, gender, reading direction of the native language, and comprehension success. Pearson correlation coefficients were also computed to examine the relationships among the dependent variables. A total of 31 participants (17 male, 14 female) took part in the study. Of these, 21 were students at Hacettepe University TÖMER and 10 at Gazi University TÖMER. All were B1-level learners of Turkish who had previously completed A2-level coursework. The participants represented a range of nationalities and were aged between 18 and 27 years. None were native speakers of Turkish.

Reading Time

The analysis of reading time revealed significant variation across the four texts. Participants generally completed the Hitit and Gazi texts more quickly, while the İstanbul and Yunus Emre texts required considerably longer times. Gender analysis showed that while both male and female participants demonstrated similar trends across the texts, females tended to spend slightly more time on average, though the difference was not always statistically significant. Examination of reading direction in the participants' native languages indicated that those accustomed to left-to-right reading completed the texts faster than those whose native language reading direction was right-to-left. This trend was consistent for both male and female participants. Correlation analysis among the four texts confirmed that participants who read more quickly in one text also tended to do so in the others, suggesting stable individual reading patterns.

Table 1. Reading Time of Participants (min)

Reading Text	Min.	Max.	Average	Std. Deviation
Yunus Emre	0.57	4.36	2.26	1.03
Hitit	1.04	4.31	2.20	0.96
İstanbul	0.57	4.47	2.33	1.06
Gazi	0.33	4.51	2.11	1.09
General Average	0.33	4.51	2.23	1.03
Test Statistics	F=0.980	p=0.460	Effect Size η2=0.073	

Fixation Duration

Findings for fixation duration closely paralleled the reading time results. The Yunus Emre and İstanbul texts produced longer average fixations, indicating greater processing difficulty, while the Hitit and Gazi texts elicited shorter fixation durations. Female participants recorded slightly longer fixations overall, suggesting a more detailed or cautious reading style, whereas male participants showed marginally shorter fixations. Reading direction of the native language again played a role, with left-to-right readers processing more efficiently. Correlation analysis showed significant positive relationships between fixation durations across the texts, indicating consistent reading behavior across different materials.

Table 2. Fixation Duration of Participants (ms)

Reading Text	Min.	Max.	Average	Std. Deviation
Yunus Emre	160	430	249.0	60.4
Hitit	140	350	232.9	49.2
İstanbul	160	490	246.8	64.4
Gazi	130	440	241.9	58.3
Overall	130	490	242.7	57.9
Test Statistics	F=3.015	p=0.034	Effect Size η2=0.091	

Fixation Count

The number of fixations followed a similar pattern, with higher counts for Yunus Emre and İstanbul and fewer for Hitit and Gazi. Female participants exhibited slightly higher fixation counts than males, consistent with their longer fixation durations. The effect of reading direction was again evident, with left-to-right readers showing fewer total fixations. Subgroup analyses indicated that this pattern was consistent across both male and female participants. Strong correlations were found across the four texts, indicating stable individual tendencies in fixation behavior.

Table 3. Fixation Counts of Participants

Reading Text	Min.	Max.	Average	Std. Deviation
Yunus Emre	6	705	306,7	157,6
Hitit	30	529	275,5	129,3
İstanbul	68	620	311,2	139,7
Gazi	14	504	278,2	108,9
Overall	6	705	292,9	133,9

Regressive Saccades

Analysis of regressive saccades showed that the Yunus Emre text elicited the highest number of regressions, followed by İstanbul. The Hitit and Gazi texts produced fewer regressions, suggesting smoother comprehension. Gender-based findings indicated that male participants exhibited slightly fewer regressions, while female participants showed more, though differences were modest. Reading direction of the native language was significant, with right-to-left readers producing more regressions. Correlation analyses across the texts indicated that participants with high regression counts in one text tended to show the same pattern in others.

Table 4. Regressive Saccade Counts of Participants

Reading Text	Min.	Max.	Average	IQR*
Yunus Emre	6	19	15	6
Hitit	3	18	9	2
İstanbul	4	17	11	2
Gazi	3	15	8	2
Overall	3	19	10	5

* Inter Quartile Range

Return Sweeps
Return sweep analysis showed a similar pattern. Participants produced the highest number of return sweeps in the Yunus Emre and İstanbul texts, while Hitit and Gazi elicited fewer. Gender differences were minimal, though female participants tended to produce slightly more return sweeps. Reading direction was again a factor, with right-to-left readers performing more return sweeps overall. Correlation analysis demonstrated consistency across texts in participants' return sweep behavior.

Table 5. Return Sweep Rates of Participants (%)

Reading Text	Min.	Max.	Median	IQR*
Yunus Emre	83,3	100,0	91,7	0,0 **
Hitit	90,9	100,0	100,0	9,1
İstanbul	83,3	100,0	91,7	0,00 **
Gazi	90,9	100,0	100,0	9,1
General Average	83,3	100,0	91,7	9,1

* Inter Quartile Range ** IQR is equal to 0, as the first and third medians have the same value.

Reading Comprehension
The comprehension results highlighted clear differences among the texts. Participants achieved the highest scores on the Hitit and Gazi texts, while comprehension was lower for İstanbul and Yunus Emre. Gender analysis indicated only minor differences, with females performing slightly better overall. Reading direction of the native language had a noticeable effect: left-to-right readers achieved higher comprehension scores than right-to-left readers. Additional analyses showed that participants with shorter reading times and lower fixation measures tended to achieve higher comprehension scores, while those with more regressions and return sweeps scored lower.

Table 6. Reading Comprehension Results of Participants

Reading Text	N	Unsuccessful %	N	Successful %
Yunus Emre	26	83,9	5	16,1
Hitit	15	48,4	16	51,6
İstanbul	26	83,9	5	16,1
Gazi	15	48,4	16	51,6
Grand Total	82	66,1	42	33,9

5. DISCUSSION
The findings of this study provide clear evidence that A2-level reading texts in widely used TTSL coursebooks do not elicit equivalent cognitive processing demands, despite their shared the CEFR labeling. This aligns with earlier concerns raised in the literature that publisher interpretations of the CEFR descriptors can vary significantly, leading to inconsistencies in actual text difficulty (Rayner, 1998; Foster et al., 2013). The eye-tracking data, supported by comprehension outcomes, confirmed that while Hitit and Gazi texts were processed relatively efficiently, İstanbul and Yunus Emre imposed noticeably greater cognitive loads. These results extend the body of research in second language reading by demonstrating the effectiveness of eye-tracking methodology in capturing micro-level cognitive processes that traditional comprehension tests cannot reveal. As noted in the Literature Review, the Eye-Mind Hypothesis (Just & Carpenter, 1980) provides a strong foundation for interpreting such findings: prolonged fixations and frequent regressions reflect increased cognitive effort and potential comprehension challenges. The strong correlation between these measures and comprehension scores in the present study reinforces the validity of eye-tracking as a diagnostic tool in language pedagogy.

In particular, the differences observed between left-to-right and right-to-left readers highlight the influence of orthographic background on reading performance in TTSL. Participants whose native languages were read left-to-right demonstrated faster reading times, fewer fixations, and higher comprehension scores than their right-to-left counterparts. This echoes Roberts (2012) and Indefrey (2006), who emphasized the value of eye-tracking in disentangling linguistic proficiency from the influence of literacy background.

Gender-based results, while less pronounced, also align with findings in the literature suggesting that female readers may engage more in careful or detail-oriented processing, as reflected in slightly longer fixation durations and higher fixation counts. However, these differences were not consistently significant, indicating that text source and reading direction were more influential variables. Figures generated from the eye-tracking data, such as heat maps and gaze plots, provide visual confirmation of the observed cognitive load differences. For example, the heat maps for Yunus Emre and İstanbul clearly show more clustered fixations and frequent regressions, illustrating how participants struggled with sections of these texts. (Figure-1)
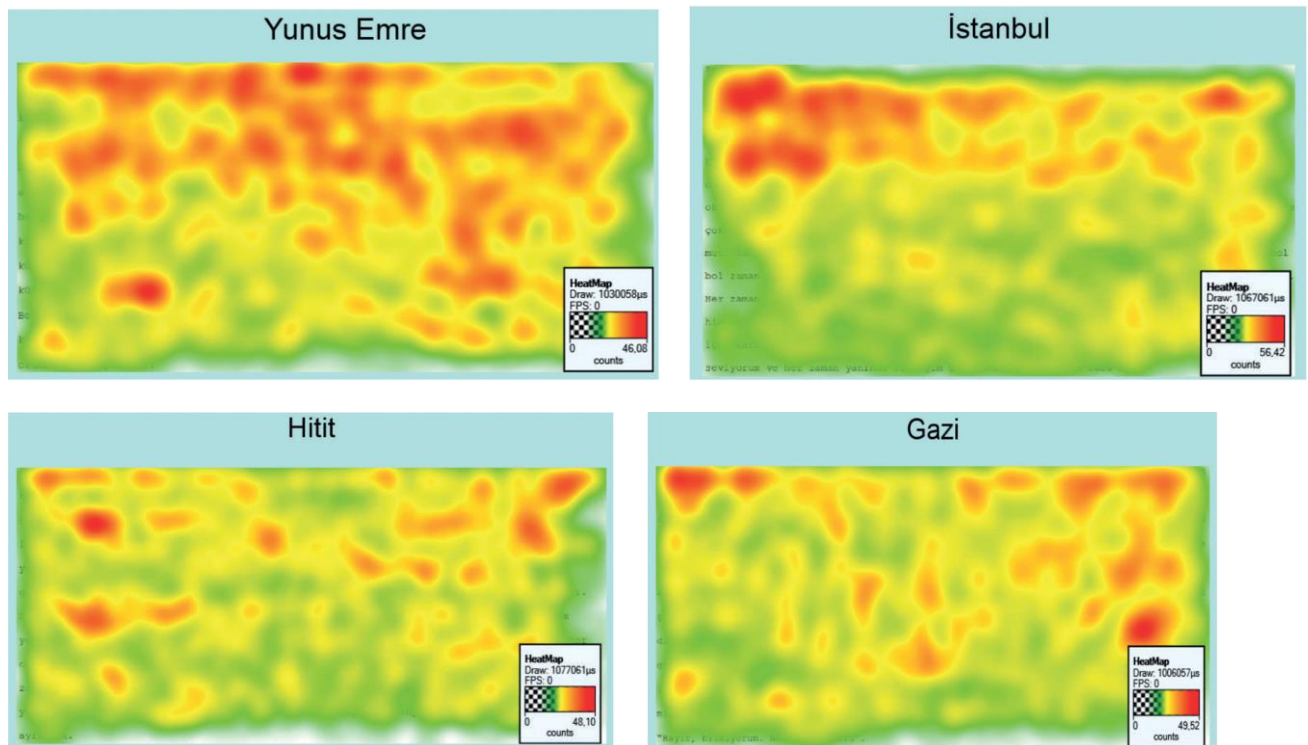
Figure-1 Heat Map of Yunus Emre and İstanbul Texts

Heat map of participant gaze distribution for the Yunus Emre and İstanbul texts, illustrating clustered fixations and frequent regressions, which indicate increased cognitive load.

In contrast, the heat maps for Hitit and Gazi demonstrate more streamlined reading patterns, consistent with higher comprehension outcomes (Figure-2). These visuals not only complement the statistical findings but also offer compelling evidence for teachers and material developers who may not be familiar with eye-tracking metrics.

Heat map of participant gaze distribution for the Hitit ad Gazi texts, showing smoother line-by-line progression and fewer regressions, consistent with lower cognitive load and higher comprehension outcomes.

From a theoretical standpoint, the study underscores the necessity of moving beyond publisher-based CEFR labels to incorporate objective validation methods in material design and selection. As Khalifa and Weir (2009) argue, comprehension is shaped not only by linguistic input but also by higher-order cognitive processes, and the present findings show how misalignment between text complexity and learner proficiency can create unnecessary cognitive barriers. Methodologically, the study demonstrates that combining behavioral eye-tracking measures with comprehension testing yields a fuller understanding of reading difficulty than either method alone. This integrative approach responds directly to the gap identified in the Literature Review: the need for real-time, evidence-based tools to evaluate the alignment of TTSL materials with CEFR expectations.

Overall, the results highlight a critical issue for TTSL pedagogy and material development: while the CEFR provides a valuable framework, it is insufficient on its own to guarantee the appropriateness of reading materials. Incorporating tools like eye-tracking into textbook evaluation can help ensure that texts not only meet formal descriptors but also support the actual cognitive readiness of learners.

6. CONCLUSION AND IMPLICATIONS
Reading Time Results
The analysis of reading times demonstrated that the Hitit and Gazi texts were processed more quickly, whereas İstanbul and Yunus Emre required substantially longer times. Gender differences were minimal, with females showing slightly longer reading durations, though not at statistically significant levels in all cases. A clear effect of reading direction emerged: learners from left-to-right language backgrounds read more quickly than those from right-to-left backgrounds. These findings suggest that text source and native language reading direction influence processing speed, and that not all A2 texts place the same cognitive demands on learners. Pedagogically, this underlines the importance of careful text selection, ensuring that materials intended for A2 learners do not inadvertently exceed their expected processing capacity.

Fixation Duration Results

Fixation duration patterns closely paralleled the reading time results. The İstanbul and Yunus Emre texts generated longer fixations, indicating greater cognitive load, while Hitit and Gazi yielded shorter fixations more consistent with A2-level expectations. Female participants tended to sustain longer fixations, and right-to-left readers exhibited higher fixation durations, reflecting more effortful processing. Since extended fixations are associated with decoding difficulty and increased cognitive strain, these results highlight the need for publishers to align syntactic complexity and lexical frequency more closely with the CEFR descriptors when preparing A2 reading materials. Teachers may also need to provide pre-reading support or glossaries for texts that prove unexpectedly demanding.

Fixation Count Results

The number of fixations confirmed the same pattern: İstanbul and Yunus Emre produced higher counts, while Hitit and Gazi resulted in fewer. Female participants generally made more fixations, and right-to-left readers showed elevated counts compared to left-to-right readers. Higher fixation counts reflect the need for more pauses to process or reprocess text segments, suggesting that some A2 materials are more complex than their labels indicate. These findings support the use of empirical validation methods like eye-tracking during material development to ensure that fixation patterns remain within the expected range for A2 learners.

Regressive Saccade Count Results

Regressive saccades were most frequent in the Yunus Emre and İstanbul texts, confirming that participants often needed to reread sections of these texts to maintain comprehension. Male participants exhibited slightly fewer regressions, while right-to-left readers showed a consistently higher rate of regressions across all texts. Since regressions are widely recognized as indicators of comprehension difficulty, their frequency in these texts raises questions about their appropriateness for A2 learners. The results imply that publishers should more carefully balance sentence length, discourse coherence, and vocabulary control in A2-level readings to avoid overloading learners.

Return Sweep Count Results

Return sweeps followed the same trend, with the highest rates in Yunus Emre and İstanbul. While return sweeps are a normal feature of reading, higher counts may reflect greater difficulty in managing line transitions within dense or complex texts. Gender differences were limited, though female participants showed slightly higher rates, and right-to-left readers consistently performed more return sweeps. This finding suggests that both text layout and structural density play roles in processing difficulty. In pedagogical terms, instructors may need to provide strategies for navigating such texts or, where possible, substitute with materials better matched to the learners' proficiency.

Reading Comprehension Results

Comprehension outcomes confirmed the behavioral findings. Participants achieved higher scores on the Hitit and Gazi texts, which were read more fluently, while comprehension was lower for İstanbul and Yunus Emre. Gender differences were minimal, with females performing slightly better overall, and left- to- right readers outperformed right-to-left readers in comprehension accuracy. Moreover, participants who displayed shorter reading times, fewer fixations, and lower regression counts also achieved higher comprehension scores, while those with more regressions and return sweeps scored lower. These results reinforce the strong relationship between eye-tracking metrics and comprehension, and they highlight the need for empirical validation of the CEFR-labeled materials to ensure that learners at the A2 level are given texts that facilitate, rather than hinder, comprehension.

Broader Implications for TTSL and CEFR Practices

The findings of this study must also be considered in the broader context of the CEFR-based curriculum and material design. The CEFR criteria are widely used in the preparation of curricula and coursebooks, as well as in the development of assessment and evaluation methods for TTSL. However, these criteria may change according to the needs and expectations of the time, and other criteria may also be incorporated into such practices. As a result, similarities and differences emerge among reading texts prepared according to the CEFR's qualitative descriptors or alternative frameworks. Eye-tracking methodology, supported by modern information technologies, allows researchers to observe learners' cognitive processes in real time, producing reliable, observation-based quantitative data. Such data can serve as a foundation for applying more objective criteria in the selection of reading texts. Teachers can also benefit from this information when organizing reading materials and designing after-reading activities. In practice, writing reading texts for TTSL requires special attention, particularly for beginner-level learners. Fictionalized reading texts may need to be edited to enhance coherence or adjusted in difficulty using eye-tracking results such as reading times, fixation durations, fixation counts, regressive saccade counts, return sweep frequencies, and comprehension outcomes. At elementary levels, the use of images can facilitate

comprehension, but eye-tracking studies can determine whether these images are genuinely functional for learners. Based on such results, images may be repositioned, redesigned, or even removed to improve effectiveness. These approaches are not only relevant for foreign learners of Turkish but also for native Turkish learners, as eye-tracking methodologies can provide valuable new perspectives on the cognitive processes underlying reading in educational contexts.

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