



Silent Reading Fluency and Reading Comprehension: Two Halves of an Apple

Treysi Lusi TERZIYAN *

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ABSTRACT

The current study aims to differentiate reading fluency and reading comprehension abilities in Turkish, a fairly transparent language. The research in these abilities with regards to transparent languages is limited. Moreover, Turkish educators appeal for a more comprehensive knowledge of reading abilities and difficulties. To address these, a cross-sectional correlation study was designed. The silent reading fluency and reading comprehension skills of 257 Turkish monolinguals from 3rd to 7th grades were evaluated. The results demonstrated that there was a positive moderate correlation between these two skills. This moderate relationship was stable from 3rd to 7th grade. The finding that this relation is only moderate indicates a lack of one-to-one correspondence between these two skills, which suggests that difficulty with one of these skills does not necessitate difficulty with the other. Hence, students' reading fluency and reading comprehension skills should be independently monitored by teachers in order to support students efficiently.

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Statement of Publication Ethics

This study has been conducted by following the publication ethics. Approval for this study with the identification code REDC # 2019/51 was obtained from the Research Ethics and Data Management Committee of Tilburg School of Humanities and Digital Sciences on the 18th of June 2019.

Conflict of Interest

There are no conflicts of interest.

* Ph.D. Student, ORCID ID: <https://orcid.org/0000-0002-8470-5432>, Tilburg University, Cultural Studies, t.terziyan@tilburguniversity.edu

Introduction

The act of reading requires decoding written words and putting these words together to comprehend the text (for a review see Hoover & Tunmer, 1993). These two components of reading correspond to two skills, respectively reading fluency and reading comprehension. The subject of “reading” in education and education research in Turkey is riddled with inconsistencies. Some studies can define “reading” only as “comprehending and interpreting what is read” (e.g. Akin & Çeçen, 2014). Moreover, the curriculum on teaching reading in Turkish classes of elementary and middle schools illustrates a lack of emphasis on reading fluency skills, especially in older grades (Arı & Keskin, 2016; Kökçü & Demirel, 2017). On the other hand, when teachers are asked to evaluate “reading difficulties”, they mostly associate “reading” with reading fluently and phonological awareness (Doğan, 2013; Kodan, 2020). The current study aims to clarify the issues and definitions regarding reading skills of Turkish children. The subjects of reading fluency and reading comprehensions will be approached separately below. Moreover, the current study will investigate the relationship between these two skills.

Reading Fluency

Teachers in Turkey associate reading difficulties with arduous reading, frequent pauses and reading mistakes (Doğan, 2013). However, these are only signs of reading fluency, one skill relevant for reading. Reading fluency can be defined as reading a text correctly and speedily (Fuchs, Fuchs, Hosp, & Jenkins, 2001). This section focuses on reading fluency, whereas the next section will focus on the other skill relevant for reading, namely reading comprehension.

Children acquire the ability to read in Turkish, which is a relatively transparent language (for more detail see Terziyan & Yıldız, 2020), faster than they do in English (Oney & Goldman, 1984). However, this does not mean that all children will easily figure out how to read in Turkish. In Erden, Kurdoğlu and Uslu’s (2002) study on over two thousand Turkish children in elementary schools, they have observed that 1.3% of the children had not acquired the ability to read. Since Turkish is easier to read due to the fact that it is mostly read the way it is written, Turkish children who have trouble reading stick out like sore thumbs among their peers. However, some children might have slight difficulties that make them harder to be noticed. The most assuring way of making sure all children with reading fluency difficulties are identified is to routinely monitor their reading fluency skills. Normative data on Turkish elementary students’ reading fluency skills can be found in two studies: Erden et al. (2002), and Bakır and Babür (2018).

Evaluations of oral reading fluency (i.e. reading out loud) as in these two studies cause feasibility issues in classrooms since they require children to be evaluated one at a time (Ülper & Yağmur, 2016). This suggests that expecting teachers to routinely monitor their students’ oral reading fluency is not realistic. The unfeasibility issue of oral reading fluency measures underlines the need for alternative methods of monitoring reading fluency, such as silent reading fluency evaluations (Ülper & Yağmur, 2016). Moreover, there is evidence that suggests silent reading fluency is more relevant for school since it

has been found to be more tightly related to comprehending what one's reading than oral reading fluency (Klauda & Guthrie, 2008).

Since reading fluency skills and academic performance are closely related (Rasinski et al., 2017), monitoring children's reading fluency in any method is especially crucial. An indication for such a relationship is found in investigations of children's reading processes. When children were asked to read aloud for the class, children with reading fluency difficulties dedicate their cognitive load to accurately reading rather than understanding what they are reading (LaBerge & Samuels, 1974). Therefore, the reluctance for reading among children with reading fluency difficulties (Torppa, Vasalampi, Eklund, Sulkunen & Niemi, 2020) is not surprising. This is troublesome because children who read as a hobby have been observed to be more successful not only in language courses but also in other courses such as science, math and history (Whitten, Labby & Sullivan, 2016). For these reasons, reading fluency of children should be monitored and children who are having difficulties should be immediately supported before their difficulties start affecting their academic performance.

Reading Comprehension

Any English speaker can read "muh vee bohn jooek" /ma vi bon dzuk/ out loud fluently in their second try even if they struggle in their first try. However, English monolingual speakers can only sound it out but cannot comprehend the meaning behind them. On the other hand, a Turkish-English speaker might be able to see the meaning behind this phrase ("mavi boncuk" 'blue bead'). This example demonstrates how reading out loud fluently and reading comprehension are distinct processes. Accordingly, the act of reading requires the ability to decode words and to understand them. Despite that, teachers in Turkey associate reading difficulties only with reading fluency but not reading comprehension (Doğan, 2013). Furthermore, while reading fluency difficulties can be noticed by arduous reading with frequent mistakes, reading comprehension difficulties are much harder to notice (Kelso, Whitworth, Parsons & Leitão, 2020). The importance of reading comprehension increases significantly after the fourth grade since this marks the switch from learning-to-read to reading-to-learn (Sanacore & Palumbo, 2009). In other words, from fourth grade on teachers start expecting children to absorb knowledge from reading assigned texts, which require many levels of reading comprehension skills.

Reading comprehension is comprised of low-level skills such as recognizing words, and especially chunks as well as high-level skills such as inferring what is between the lines (Pressley, 2000). Skills of reading comprehension can be summarized from lower to higher levels as: (1) sentence comprehension, (2) putting together sentences to construct the meaning of the text, (3) incorporating background knowledge with information in the text, (4) discerning textual elements, (5) self-regulating their comprehension of the text (Irwin, 1983; 1991; 2006). Especially higher-level reading comprehension skills are strongly related to academic performance (Meneghetti, Carretti, & De Beni, 2006). Deficits in any variety of reading comprehension skills have been observed in children with reading comprehension difficulties (Williams, 1993).

In international reading comprehension assessments, all of these reading comprehension levels are specifically targeted. On such assessments, Turkish children have performed significantly lower than children from other countries (Mullis, Martin, Gonzalez & Kennedy, 2003). As a response to these results, Ministry of Education in Turkey has overhauled the education system but upon seeing consistently low performance of Turkish students in international assessments, some aspect of the education has reverted back (Savaş, 2017). Another country that has underperformed in these assessments was Portugal (Araújo, Folgado & Pocinho, 2009). When the possible underpinnings of their results were investigated, researchers came to the conclusion that an emphasis on lower-level reading comprehension skills and a lack of emphasis on higher-level reading comprehension skills in Portuguese education leads to the low performance of Portuguese children in international reading comprehension assessments (Araújo et al., 2009). Turkish education in elementary schools incorporates all levels of reading comprehension skills (Tüm, 2016); however, the prominence by far is on lower-level reading comprehension skills (Coşkun, 2013; Sarar Kuzu, 2013; İnce & Gözütok, 2017; Çeliktürk Sezgin & Gedikoğlu Özilhan, 2019). Moreover, when reading comprehension questions created by teachers were investigated, it was revealed that teachers tended to create lower-level reading comprehension questions (e.g. Polat & Dedeoğlu, 2020). Therefore, it can be surmised that Turkish children's low performance in international reading comprehension assessments might be explained by the lack of sufficient training in higher-level reading comprehension skills in line with the findings of the Portuguese researchers.

Considering children with reading comprehension difficulties struggle most with higher-level reading comprehension skills (Bowyer-Crane & Snowling, 2005), Turkish education focusing mostly on lower-level reading comprehension skills might conceal the difficulties these children might be having. It would be hard for teachers to notice difficulties children might be having in higher-level reading comprehension skills if such skills are almost never utilized in classes. Moreover, children with reading comprehension difficulties might be lost within Turkish children's overall low performance regarding reading comprehension. Therefore, monitoring children's reading comprehension skills consistently is essential for discerning the ones who are struggling.

Monitoring children's reading comprehension skills is also important for non-language courses as well. While math and science courses focus on lower-level reading comprehension skills such as retrieving explicitly stated information in Turkish elementary education (e.g. Taştekinöğlü & Aydın, 2014), same courses focus on higher-level reading comprehension skills such as applying or evaluating information stated in the text in Turkish middle school education (Özcan & Oluk, 2007; Gündüz, 2009; Biber & Tuna, 2017). Consequently, children with low reading comprehension skills might struggle in these courses as well. Therefore, it is not surprising that children with reading comprehension difficulties were observed to be unmotivated towards language courses as well as other courses and overall exhibiting symptoms of burnout syndrome (Torppa et al., 2020). Hence, it would be misguided to assume that reading comprehension difficulties only affect language courses because they affect academic performance across-the-board.

Current Study

The literature on literacy abilities in children has demonstrated that the relationship between reading fluency and reading comprehension is positive, moderate and significant even in higher grades (e.g. Denton et al., 2011). However, as Ziegler and Goswami (2006) point out most studies on literacy acquisition has been focused on English but since English language is highly distinct from other languages, literacy research in English is not an appropriate lens for understanding literacy in other languages (for a review, see Share, 2008). Therefore, a relationship between reading fluency and reading comprehension in English does not necessitate such a relationship in Turkish as well. Research on languages more transparent than English have found that the strength of the relationship between these two skills diminishes over time as children grow older and increase their literacy skills (e.g. Torppa et al., 2016). Research on Turkish has found significant relationships in elementary school between oral reading fluency and reading comprehension (Baştuğ & Akyol, 2012; Baştuğ & Keskin, 2012; Yıldırım & Ateş, 2012; Kaya & Yıldırım, 2016) as well as silent reading fluency and reading comprehension (Yıldırım & Ateş, 2012; Çetinkaya, Ülper & Yağmur, 2015; Saraçlı Çelik, 2019). Considering other languages more transparent than English have demonstrated a decline in the strength of the relationship between reading fluency and reading comprehension (e.g. Torppa et al., 2016), there is a need for research demonstrating the relationship between these two skills in Turkish over time from elementary school to middle school.

The current study aims to provide insight to the relationship between silent reading fluency and reading comprehension in Turkish over time. This aim is relevant both for the researchers interested in children's literacy acquisition as well as the educators in Turkey. The current study adds to the body of research on children's literacy acquisition by investigating the relationship between these two skills between ages 7 and 11 in a fairly transparent language. Moreover, the current study is designed to provide support for teachers who find their education on literacy related issues inadequate and urge for increased education in these topics (Balci, 2019) by illustrating how these skills can be investigated and how much these skills are related throughout elementary and middle school. We expect to demonstrate a significant moderate positive correlation between silent reading fluency and reading comprehension in Turkish speaking typically developing children between third and seventh grades. However, in line with previous research on relatively transparent languages, this relationship is expected to decrease over time.

Methodology

Research design and publication ethics

The current study was a cross-sectional (between 3rd and 7th grades) correlation study with two variables (silent reading fluency and reading comprehension). The task evaluating silent reading fluency measures the speed of accurate reading. The task evaluating reading comprehension provides a text and measures participants' ability to comprehend and interpret the text at five levels detailed above. Approval for this study

with the identification code REDC # 2019/51 was obtained from the Research Ethics and Data Management Committee of Tilburg School of Humanities and Digital Sciences on the 18th of June 2019.

Participants

Participants were collected from seven randomly chosen schools from two boroughs of Istanbul, namely Bakırköy and Şişli. Permissions have been obtained from the directors of Ministry of Education of Istanbul, Bakırköy and Şişli, school principals and the parents of the participants. Moreover, verbal consents have been obtained from the participants. The descriptive statistics on the participants are given in Table 1. The total number of participants is 257. However, one of the 5th grader's data has been removed from the study due to failure to complete the study.

Table 1. The participants' descriptive statistics

Grade	Number of Participants	Average Age (SS)	Percentage of Female Participants	Percentage of Male Participants
3	51	7;7 (0;4)	59	41
4	52	8;8 (0;5)	47	53
5	50	9;7 (0;5)	59	41
6	53	10;5 (0;4)	50	50
7	51	11;4 (0;4)	52	48

Materials

Silent reading fluency task evaluated children's ability to read swiftly and accurately. This task, which was created for the current study, was inspired by established international assessments (Test of Silent Reading Efficiency and Comprehension, Wagner, Torgesen, Rashotte & Pearson, 2010; Kaufman Test of Educational Achievement III, Kaufman & Kaufman, 2014; Woodcock Johnson-IV: Tests of Achievement, Schrank, Mather, & McGrew, 2014). The silent reading fluency task was composed of 60 easily understandable sentences. The average number of letters in these sentences was 23.7. Sentences made up of two words was 8, three words 30, four words 15 and five words 7. Half of these sentences was true and the other half was false. The sentences were especially easy to judge. An example of a true sentence was "Limonlar ekşidir" 'Lemons are sour'. An example of a false sentence was "Çilek bir sebzedir" 'Strawberries are vegetables'. The motivation behind generating easily judged sentences laid with the purpose of this task was to evaluate their reading fluency and not reading comprehension.

The other task in the current study is the reading comprehension task, which evaluates children's ability to understand and critically think about a text. This task was created for the current study and was inspired by the international reading comprehension assessments such as PIRLS (Mullis, Martin, Foy & Drucker, 2012) and PISA (Schleicher, Zimmer, Evans & Clements, 2009). This task consists of an expository text and 15 questions about it. The questions fell into five categories and there were three questions from each category. The categories are as follows:

- i. Finding explicit information: These questions required children to find explicitly stated information in the text
- ii. Inference within a paragraph: These questions required children to integrate two explicitly stated information within a paragraph in order to make an inference
- iii. Inference across paragraphs: These questions required children to integrate two explicitly stated information in different paragraphs in order to make an inference
- iv. Background information: These questions required children to integrate information they already knew with a piece information explicitly stated information in the text
- v. Meta-linguistic and meta-textual knowledge: These questions required children to think about language use and authorial intent

Procedure and Data Analysis

The author informed the schools about the study and discussed its details initially with the principals and/or vice-principles of the schools. Then, she explained the details of the study with either the school's counselor or the classroom teachers depending on the schools' preferences. The author was provided with randomly selected classrooms per grade level. She arranged the dates and times of testing with the school and supplied them with enough informed consent forms for the students in the designated classrooms. On the day of the testing, she collected the informed consent forms back. The author tested the participants in a classroom at their school as a group. Students whose parents did not give consent were given an assignment to work on by their teacher. The author obtained verbal consent from the rest of the students before testing began. The students whose parents consented but did not want to participate in the study were asked to complete the assignment given by their teacher. Each student participating in the study was given a set of stickers which all had the same number on them. They were asked to put a sticker on each piece of paper they were turning in and they were informed to not to write their names on the tasks. These numbers acted as the participants' identifiers.

For the silent reading task, they were explained that they needed to put a "T" next to true statements and "F" next to false statements. In order to make sure they understood the task, they were asked "What letter would you write for the sentence 'Our flag is blue and green'?", which they answered aloud as a group. Then, they were asked "What letter would you write for the sentence 'Our flag is red and white'?", which again they answered aloud as a group. Afterwards, they were given the opportunity to ask questions. When the experimenter was satisfied that all the participant understood the task, they were handed out printed version of the list of sentences in the silent reading fluency task. The print outs were upside down so that they could not see the sentences until the timer was started.

Third and fourth graders were told they had 3 minutes whereas fifth, sixth and seventh graders were told they had 2 minutes. They were explained that they needed to read and correctly assess as many sentences as they could in the allotted time. They were also explained that they were not expected to finish going through all the sentences and that the number of sentences were intentionally too many for them to be able to finish. Then, they were asked to turn over the print outs at which time the researcher started the timer. The participants were prompted when they had a minute left and another one when they had 15 seconds left. When their allotted time was up, they were asked to put their pens down and pass their print outs to the front of the class. The score each participant received from this task was calculated by determining the sentences they have correctly judged, counting the number of words in these sentences and dividing this number by the allotted time (3 for third and fourth graders but 2 for fifth, sixth and seventh graders). For example, if a fifth grader correctly assessed six sentences as true or false, the researcher would count the number of words in these six sentences and divide it by two. This value represents the number of words they correctly read in one minute.

For the reading comprehension task, the participants were explained that they were going to be asked to read a text and then answer questions about this text. They were told that they could go back to the text while answering the questions. They were asked to finish the task within 20 to 30 minutes. They were handed out the text and the questions. The time for this task was more flexible. While all participants started this task at the same time, some of them completed and turned in their papers before the allotted time was over. The score they received from this task was the number of questions they correctly answered.

Two separate one-way ANOVAs were conducted to determine whether there was a difference between grades. One was for the silent reading fluency and the other for the reading comprehension task. This analysis compares average score of each grade with each other. For example, the average score of the third graders is compared to the average score of fourth graders, and that of fifth graders, sixth graders and seventh graders. In order to explore the relationship between silent fluency skills and reading comprehension skills, a series of correlations between the scores of these two tasks were run. Due to the nature of the data (e.g. it is not continuous), Spearman's rank correlation was used (Khamis, 2008). A correlation was conducted per grade as well as overall across the grades.

Results

The average scores participants received in the silent reading task by grade along with the standard deviation and the first quartile are given in Table 2. This table can be read as follows: Third graders on average read between 26.63 and 49.21 words in a minute; moreover, 75% of the third graders read more than 30.3 words in a minute. The ANOVA revealed a significant effect of grade, $F(4, 254) = 42.394$, $p < .001$. Post-hoc comparisons revealed only the difference between the average scores of fourth and fifth graders was insignificant while all the other differences between grades were significant. This suggests that higher grades read more words per minute than lower grades.

Table 2. The Results of the Silent Reading Fluency Task

Grade	Average	Standard Deviation	First Quartile
3	37.92	11.29	30.3
4	48.03	11.91	36.0
5	51.18	15.61	40.9
6	62.08	18.61	51.0
7	74.27	17.59	62.0

The average scores participants received in the reading comprehension task by grade along with the standard deviation and the first quartile are given in Table 3. The ANOVA revealed a significant effect of grade, $F(4, 254) = 16.01$, $p < .001$. All post-hoc comparisons revealed significant differences between grades except the difference between fifth and sixth grade. Moreover, the difference between fourth and sixth grade was found to be almost significant ($p = .073$). There were five types of questions in this task and 3 questions for each type. In other words, there were fifteen questions total. Average scores on each type of question by grade are provided on Table 4.

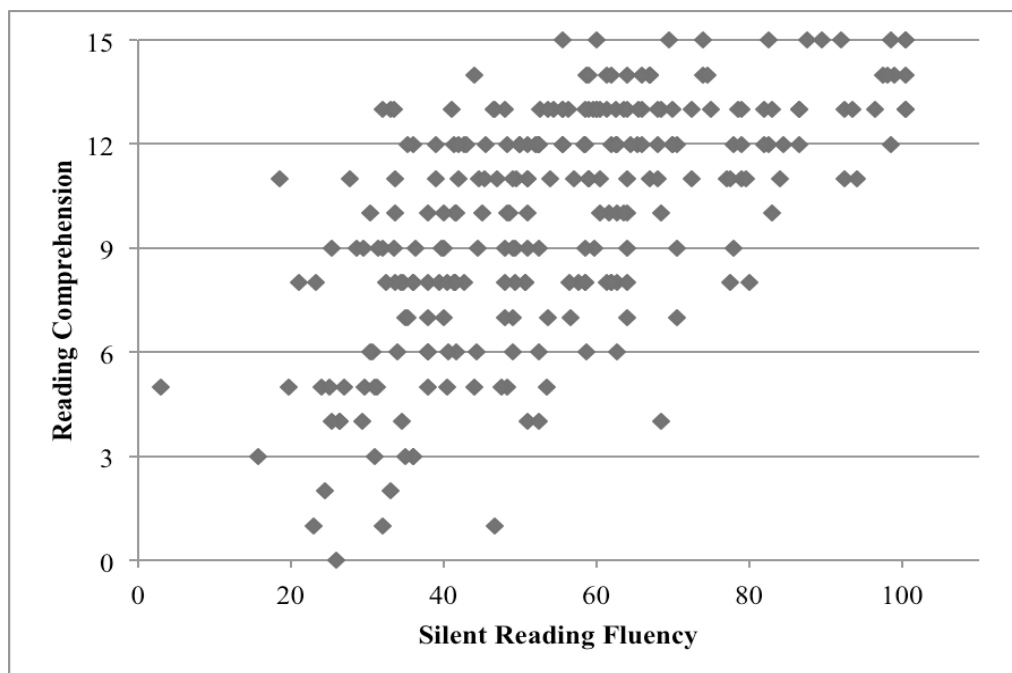
Table 3. The Results of the Reading Comprehension Task

Grade	Average	Standard Deviation	First Quartile
3	7.92	3.53	5
4	9.25	3.17	8
5	10.40	2.84	9
6	10.26	2.97	8.5
7	12.41	2.09	12

Table 4. The Results of the Reading Comprehension Task by Question Type

Grade	Finding Explicit Information	Inference within a Paragraph	Inference across Paragraphs	Background Information	Meta-linguistic and Meta-textual Knowledge
3	2.0	1.7	1.2	1.5	1.6
4	2.1	2.0	1.5	1.8	1.9
5	2.3	2.4	1.6	1.9	2.2
6	2.1	2.4	1.6	1.8	2.2
7	2.8	2.7	2.0	2.2	2.7

The overall correlation between silent fluency task and reading comprehension task revealed a positive and significant relationship between the tasks, $r_s = .613$, $p < .001$, as illustrated in Figure 1. The strength of this relationship was considered to be moderate (Asaad & Hailaya, 2001, p. 105). Figure 1 includes all the participants. Each data point on the figure represents how that participant performed on the reading comprehension task (y-axis) and on the silent reading fluency task (x-axis). The correlations conducted per grade also revealed positive and moderate relationships (third grade, $r_s = 0.55716$; fourth grade, $r_s = 0.36184$; fifth grade, $r_s = 0.53694$; sixth grade, $r_s = 0.4608$; seventh grade, $r_s = 0.4217$). All of these correlations were significant as well ($p < .005$).

Figure 1. The overall relationship between silent fluency and reading comprehension

Discussion and Conclusion

The current study cross-sectionally explored the development of silent reading fluency skills and reading comprehension skills of Turkish students between third and seventh grades. As expected, a positive moderate relationship has been found between these two skills. This finding is in line with research on the relationship between silent reading fluency and reading comprehension in other languages (e.g. Denton et al., 2011). Moreover, these findings from the current study complement other studies that explore this relationship in Turkish, which has mostly focused on elementary school students (Yıldırım & Ateş, 2012; Çetinkaya et al., 2015; Saraçlı Çelik, 2019) by illustrating this relationship exists in middle school as well.

There might be an inclination to interpret this correlation in terms of low fluency leading to low comprehension and high fluency leading to high comprehension. One might think if the child is not decoding words, how can they understand what they are reading so they might assume the reading fluency abilities of a child might determine their reading comprehension. There are, in fact, researchers that argue “fluency is one of the most necessary factors for comprehension” (Akyol & Kodan, 2016, p. 9). However, the opposite can be argued as well. One might think if the child comprehends what they are reading, they will activate relevant concepts in their minds, which will lead to recognizing the following words faster. Support for such an argument can be found in Jenkins and colleagues’ (2003) study that has found evidence for reading comprehension contributing to reading fluency. On the other hand, one can also argue, as some researchers do, that there is a reciprocal relationship between reading fluency and reading comprehension and that they both contribute to each other (e.g. Strecker, Roser, & Martinez, 1998). Alternatively, there can be a third variable that is contributing to both as in the example of

the correlation between ice cream sales and drowning cases for which the third variable is temperature (Babbie, 2004). The third variable affecting both reading fluency and reading comprehension could, for example, be vocabulary skills. Vocabulary skills of children have found to be predictors for both reading fluency (Lane et al., 2008) and reading comprehension (Ouellette, 2006). The current study's finding is a correlation and it is not capable of supporting any of the previously stated arguments. "Correlation does not equal causation, nor does it imply causation; it merely records the fact that 2... variables are not completely independent of one another," (Winters, Winters, & Amedee, 2010, p. 216).

If one cannot make such arguments listed above based on the current study's finding results, it begs the question what does this correlation indicate. Such a correlation is not surprising considering all the manners reading fluency and reading comprehension are interconnected as outlined above. What is perhaps surprising is that the level of this correlation is only moderate. Literacy curriculum deemphasizing reading fluency skills in older grades (Arı & Keskin, 2016; Kökçü & Demirel, 2017) treats reading fluency and reading comprehension either as the same skill (i.e. assuming that just working on reading comprehension would be enough to improve reading fluency) or as comprehension is the only relevant skill in older grades. Both such assumptions would be false. The correlation between reading comprehension and reading fluency is only moderate as the current study demonstrated, which suggests that they are not the same skill. If they were the same skill, the correlation would be much higher. The assumption that reading fluency is irrelevant in older grades is also an erroneous one according to studies that illustrate the importance of reading fluency for general academic success (e.g. Rasinski et al., 2005; Bigozzi et al., 2017). The findings of the current study suggest that both reading fluency and reading comprehension should be addressed in the literacy education curriculum even in older grades. This might be counterintuitive for educators or researchers because techniques often used for reading fluency in younger grades are not appropriate for older grades. For example, Öрге Yaşar (2019) finds reading out loud, a common activity in early grades, inappropriate for seventh graders. She recommends the solution of using age-inappropriate reading fluency activities and asserts that other activities such as closet drama are more appropriate for older students. Similarly, Rasinski and colleagues (2005) point out that techniques for improving reading fluency can be instigated through performative activities such as reciting poetry. Emphasizing both reading fluency and reading comprehension throughout education is necessary because the correlation between these two skills was found to be remain moderate over time in the current study.

This relationship between silent reading fluency and reading comprehension in Turkish remaining stable from third to seventh grade was contrary to the expectations. While there have been studies on fairly transparent languages that have found a significant relationship between reading fluency and reading comprehension in higher grades (for Spanish see Álvarez Cañizo, Cueva, Cuetos Vega, & Suárez Coalla, 2020), they have been cross-sectional studies with limited age ranges. Since those studies have limited age ranges, one cannot surmise whether the relationship between reading fluency and reading comprehension used to be higher but decreased with time. Longitudinal research with larger age ranges in fairly transparent languages, on the other hand, illustrated that in such

languages the relationship between reading fluency and reading comprehension decreases over time. For example, a study that investigated Finnish has found that the relationship between silent reading fluency and reading comprehension diminishes within the first couple of grades in elementary school (Torppa et al., 2016). They draw the conclusion that in transparent languages children get so good at reading fluency that it does not influence reading comprehension due to the ceiling effect. However, the methodology they use to determine reading fluency overlooks an important aspect of reading fluency: prosody. Prosody is reading “with appropriate expression or intonation coupled with phrasing that allows for the maintenance of meaning” (Kuhn, Schwanenflugel, & Meisinger, 2010, p. 233). The current study suggests that when prosody is included in reading fluency measures, the correlation between reading fluency and reading comprehension remains stable even in fairly transparent languages. This underlines the importance of methodology used to measure reading fluency and reading comprehension. Below various measurement tools will be described and appraised.

The measurement tools used by Torppa and colleagues (2016) to assess and evaluate silent reading fluency were focused on reading fluency at word level. One was a matching task where the students matched pictures with words. The other was similar to the Test of Silent Contextual Reading Fluency (Hammill, Wiederholt & Allen, 2006). In this task, children were presented with a string of letters and they were asked to put lines between words within the allotted time. For example, the string “moonpinkcatbook” is divided into “moon|pink|cat|book”. Studies on literacy acquisition in Turkish have used similar tasks (e.g. Yıldırım & Ateş, 2012). The current study has not used these types of task due to these tasks only assessing reading fluency at word level and excluding prosody as well as these tasks’ incompatibility with the agglutinative characteristics of Turkish. Since both of these measurement tools are at word level, they do not assess reading prosody. Moreover, neither of these tasks would embrace the agglutinative characteristic of Turkish. Any reading measurement tool in Turkish that avoids suffixes would not be naturalistic because a large portion of words one reads has suffixes on them. For the picture-matching tool, it would be impossible to have a picture for “kitabın” ‘of the book’. For the string-of-words tool, an attempt to cope with this issue would be using strings of words with suffixes (e.g. “aydan|pembemsi|kedim|kitaplar” ‘from the moon|pinkish|my cat|books’). However, this might lead to children drawing a line after the word root then noticing the suffix, which would necessitate the children to erase the line they drew after the word root and draw another line after the suffix. Hence, they might lose time, get confused and even become frustrated.

Another type of silent reading fluency measurement used in the literature on literacy acquisition in Turkish is asking children to read a passage and let the experimenter know when they are done (e.g. Saracaloğlu, Dedebali & Karasakaloğlu, 2011). Such a measurement tool assesses accuracy, speed and prosody and would be a better assessment of reading fluency. However, this measurement does not provide insight into whether the children actually read the whole passage or how accurately they read it (Fuchs et al., 2001). A child could just skim the passage or another child declare that they are done halfway through the passage and the experimenter wouldn’t really know unless a second

part is added to this measurement. Asking reading comprehension questions after the child reads the passage might be an appropriate way to judge whether the child has read the whole passage. However, in this case the data of children who fail the reading comprehension part would have to be thrown out. This might skew the data and such an action would be considered avoidable data loss.

A type of silent reading fluency measure commonly used in literature (e.g. Çetinkaya et al., 2015; Saraçlı Çelik, 2019) is the standardized “Doğru ve Akıcı Sessiz Okuma Testi” ‘Accurate and Fluent Silent Reading Test’ (Ülper & Yağmur, 2016), which has taken its inspiration from the Test of Critical Early Reading Skills (Torgeson, Wagner, Lonigan, & DeGraff, 2002). In this test, children are given a list of real and pseudowords and asked to find as many real words as possible given in the allotted time. The children’s score on this measurement is based on how many real words they have found in the given time. However, it should be noted that this score is not a direct representation of the actual number of items they read in this measurement because these children also read pseudowords, which are not accounted for in their score. The pseudowords in this measurement are generated from real Turkish words so that pseudowords are not obviously apparent and the children cannot immediately tell that they are not Turkish words. For example “kjfyua” would be very easy for children to recognize as “not a real Turkish word” and therefore this measurement avoids such highly obvious fake words. Examples of pseudowords used in this measure are “hespi” (from “hepsi” ‘all’), “cokşu” (from “coşku” ‘enthusiasm’), “izma” (from “imza” ‘signature’), “yeçrek” (from “çeyrek” ‘quarter’) and “tağık” (from “kağıt” ‘paper’) among many others (Saraçlı Çelik, 2019). If you know Turkish, you might have not even realized that the former three are pseudowords because our brains can “read” words if the all the letters are jumbled expect the initial and final letters. This phenomenon is called typoglycemia (Lower, 2014). Typoglycemia and vocabulary skills have been found to be positively correlated (Assa, 2017). This suggests that children with higher vocabulary would be better at recognizing words even if their middle letters are jumbled. In other words, such a child would see “hespi” and read “hepsi” and mark this pseudoword as a real word. This would mean that children with higher vocabulary skills would make more mistakes on this measure, and they would lose precious time marking down these wrong answers. Consequently, a child with higher vocabulary skills would get a lower score than a child with lower vocabulary skills but similar silent reading speed. Therefore, this measure might be biased against children with higher vocabulary skills. Moreover, this measurement tool also neglects prosody since it assesses children’s reading fluency as word level. For these reasons, the current study opted not to use this measure.

The current study has chosen to adapt another type of silent reading fluency measure into Turkish due to shortcomings of the types of measurements listed above. However, the current measurement also has potential limitations. The current measurement requires children to judge whether the sentence they read is true or false and such judgments inevitably involve reading comprehension skills. In order to lessen the effects of reading comprehension skills on this measurement, the sentences were constructed to be highly straightforward. Moreover, avoiding reading comprehension skills in silent reading

fluency is inescapable. All silent reading measures outlined above are also contingent on the children's ability to recognize words. When a person recognizes a word, they also think about its meaning which has been demonstrated by priming studies (for an overview, see Gulan & Valerjev, 2010). Such studies have shown that people tend to recognize words faster if they are shown related words before hand. For example, they recognize "dog" faster after seeing "cat" (a related word) than they do after seeing "salt" (unrelated word). Therefore, while the silent reading measurement of the current study involves reading comprehension skills, silent reading measurements cannot avoid reading comprehension skills in any event.

The other measurement of the study, the reading comprehension measurement, is similar to the one used by Torppa and colleagues (2016). This type of reading comprehension measurement, which consists of reading a text and answering questions about it, is frequently used on in the literature on literacy acquisition in Turkish (e.g. Baştuğ & Keskin, 2012; Çetinkaya et al., 2015; Kaya & Yıldırım, 2016; Saraçlı Çelik, 2019). An example of a much less infrequently used measurement for reading comprehension in the literature is confirming sentence meanings task (e.g. Yıldırım & Ateş, 2012). In this measurement tool, children are expected to compare various sentences and decide whether these sentences have the same meaning or not. The current study has chosen to utilize the more frequently used measurement since it is analogous to reading comprehension activities present in Turkish education books, which also revolves around reading texts and answering questions about them (Tüm, 2016).

The current study illustrated how reading skills of children can be evaluated by providing two measurement tools that focus on different reading skills, silent reading fluency and reading comprehension. Teachers' awareness of their students' reading skills is relevant for organizing their materials based on their classrooms' general strengths and weaknesses (Lane, Oakes, & Menzies, 2010). Measurement tools teachers can use to track their students' reading skills in Turkish are not widely available. They can use normative information on elementary students' oral reading fluency in Erden and colleagues' (2002) or Bakır and Babür's (2018) studies. There is no normative information on children's silent reading fluencies in the literature (Çetinkaya et al., 2015, p. 1000). On the other hand, a normative measurement on children's reading comprehension abilities is "Okuma-Anlama Testi" 'Test of Reading and Understanding' (Ülper, Çetinkaya, & Bayat, 2017); however, the author has failed to find information on this measurement online. There is another measurement tool on reading comprehension titled "Sesli Okuma Becerisi ve Okuduğunu Anlama Testi" 'Oral Fluency Skills and Reading Comprehension Test', which is still under the process of collecting normative information (Çelik, Erden, Özmen, & Tural Hesapçioğlu 2016, p. 108). Since children with reading difficulties referred to be specialist by their teachers (Cappa & Giolivi, 2014), the lack of widely available normative reading skills measurement is especially important because teachers have been found to be highly lacking in terms of their knowledge of and ability to recognize specific learning disorders, which includes reading difficulties (Clure, 2013; Flynn & Rahbar, 1998; Madelaine & Wheldall, 2005). They also can have misconceptions about reading difficulties (Dinç, 2017). However, when teachers were provided with appropriate

instruments to base their judgments on, teachers were highly reliable in their judgments of children's abilities (e.g. de Araújo Vilhena, & Vieira Pinheiro, 2016). The current study provides a sample of measurement tools for assessing and evaluating reading skills. Next, standardized measurement tools for assessing and evaluating Turkish reading skills with normative information should be developed and made wide available and free for teachers to use. An important finding of the current study is that different reading skills should be assessed and evaluated separately because as Figure 1 demonstrated a child can be good at one reading skill and poor at another.

In the literature on reading difficulties in Turkish, some studies assess both reading fluency and reading comprehension in other to determine which children have a reading difficulty (e.g. Sidekli, 2010) while others only assess one of them (e.g. Kodan & Akyol, 2018; Kuruoğlu & Şen, 2018). Moreover, some studies determine that a child has a reading difficulty only if they have both poor reading fluency and poor reading comprehension (e.g. Türkmenoğlu & Baştuğ, 2017). While all these studies are informative, the manner in which they defined reading difficulty criteria might have limited their findings. Studies that use only reading fluency as a reading difficulty criterion, for example, would overlook children who have reading difficulties due to poor reading comprehension. The current study's findings suggest that if one is using only reading comprehension or reading fluency while determining reading difficulties, one might miss children who have reading difficulties. This is in line with what Baydık (2011) observed in his study on reading difficulties, which was that 5.2% of the students with reading comprehension difficulties did not demonstrate reading fluency difficulties. Literature on reading difficulties in English also illustrated that children might have a reading difficulty due to issues regarding only reading comprehension, only reading fluency or both (e.g. Leach, Scarborough, & Rescorla, 2003). Similar to Baydık (2011), Clemens and colleagues (2017) observed that most children with reading comprehension difficulties in English also had reading fluency difficulties but not all. They conclude that "If assessment is limited to solely to tests of reading comprehension that do not allow for fine-grained analysis of component reading and language skills, it may be difficult to determine whether comprehension difficulties are constrained primarily by foundational skill deficits as opposed to difficulties in higher order text processing" (p. 794). In other words, assessing a child's reading difficulties is not only to determine a reading difficulty but also to determine a course of action for intervention. Therefore, the repercussions of not assessing children's both reading comprehension and reading fluency abilities are twofold. First, one might miss children who have reading difficulties due to the area not tested. Second, one can have an incomplete picture on what to work on in remediation or intervention in order to improve children's reading abilities.

Interventions for reading comprehension and reading fluency have quite different approaches. Intervention for reading fluency difficulties involves phonological awareness training (O'Shaughnessy & Lee Swanson, 2000), letter-sound training (Mercer et al., 2000), explicitly teaching sight words/phrases (Mercer et al., 2000), repeatedly reading the same text (Conderman & Strobel, 2008) and imitating teacher's reading (Young, Mohr, & Rasinski, 2015). On the other hand, intervention for reading comprehension difficulties

involves prereading (activating prior knowledge about the subject and making predictions about the text), summarizing the text, identifying main ideas of the text, self-monitoring comprehension, explicitly teaching narrative story structure and clarifying vocabulary (for an overview see Berkeley & Larsen, 2018). Since reading comprehension and reading fluency require different types of interventions, one would not expect intervention in one to improve the other. Ritchey, Palombo, Silverman and Speece (2017) investigated just that and found that reading comprehension intervention (while improving reading comprehension) did not improve reading fluency. Likewise, Soriano and colleagues (2011) found that reading fluency intervention (while improving reading fluency) did not improve reading comprehension. These studies underline the need for understand what a child is having difficulty with and addressing them directly instead of just providing a random reading intervention.

In conclusion, the current study demonstrates that silent reading fluency and reading comprehension skills are only moderately correlated two skills. A comprehensive view on a child's reading proficiency would require both reading fluency and reading comprehension skills to be assessed and evaluated because a child's one skill does not determine the other. As a matter of fact, there are children who have higher reading fluency skills but lower reading comprehension skills as well as children who are vice versa. This finding has consequences for education, diagnosis and intervention.

References

- Akın, E., & Çeçen, M. A. (2014). Ortaokul öğrencilerinin okuma stratejileri üstbilişsel farkındalık düzeylerinin değerlendirilmesi (Muş-Bulanık örneği) [Secondary school students' metacognitive awareness of reading strategies level (Muş-Bulanık sample)]. *Turkish Studies: International Periodical For The Languages, Literature and History of Turkish or Turkic*, 9(8), 91-110.
- Akyol, H., & Kodan, H. (2016). Okuma güçlüğü olan bir öğrencinin okuma güçlüğü'nün giderilmesine yönelik bir uygulama: Akıcı okuma stratejilerinin kullanımı [A practice for eliminating reading difficulty: The use of fluent reading strategies]. *Ondokuz Mayıs Üniversitesi Eğitim Fakültesi Dergisi*, 35(2), 7-21.
- Álvarez Cañizo, M., Cueva, E., Cuetos Vega, F., & Suárez Coalla, M. P. (2020). Reading fluency and reading comprehension in Spanish secondary students. *Psicothema*, 32(1), 75-83.
- Araújo, L., Folgado, C., & Pocinho, M. (2009). Reading comprehension in primary school: Textbooks, curriculum and assessment. *L1 - Educational Studies in Language and Literature*, 9(4), 27-43.
- Arı, G., & Keskin, H. K. (2016) Türkçe dersi (1-8. sınıflar) öğretim programı okuma öğrenme alanındaki kazanımlarla ilgili eleştirel bir değerlendirme [A critical evaluating of acquisitions in reading learning areas of Turkish curriculum (grades 1-8)]. *Sakarya Üniversitesi Eğitim Fakültesi Dergisi*, 32, 144-169.
- Asaad, A. S., & Hailaya, W. M. (2001). *Statistics as applied to education and other related fields*. Rex Book Store, Inc.
- Assa, H. F. (2017). *The correlation between students' accuracy in reading typoglycemic words in sentences and vocabulary mastery* [Unpublished bachelor's thesis]. Universitas Brawijaya.
- Babbie, E. (2004). *The Practice of Social Research* (10th ed.). Belmont, CA: Wadsworth.

- Bakır, F. H., & Babür, N. (2018) Hızlı otomatik isimlendirme testi'nin Türkçeye uyarlanması [Adaptation of rapid automatized naming tests to Turkish]. *Boğaziçi Üniversitesi Eğitim Dergisi*, 35(2), 35-51.
- Balcı, E. (2019). Disleksi hakkında öğretmen görüşleri ve karşılaştıkları sorunlar [Teachers' opinions about dyslexia and the challenges they face]. *Ege Eğitim Dergisi*, 20(1), 162-179.
- Baştuğ, M., & Akyol, H. (2012). Akıcı okuma becerilerinin okuduğunu anlamayı yordama düzeyi [The level of prediction of reading comprehension by fluent reading skills]. *Kuramsal Eğitimbilim Dergisi*, 5(4), 394-411.
- Baştuğ, M., & Keskin, H., K. (2012). Akıcı okuma becerileri ile anlama düzeyleri (basit ve çıkarımsal) arasındaki ilişki [The relationship between fluent reading skills and comprehension level (literal and inferential)]. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi*, 13(3), 227-244.
- Baydık, B. (2011). Okuma güçlüğü olan öğrencilerin üstbilişsel okuma stratejilerini kullanımı ve öğretmenlerinin okuduğunu anlama öğretim uygulamalarının incelenmesi [Examining the use of metacognitive reading strategies of students with reading difficulties and their teachers' reading comprehension instruction practices]. *Eğitim ve Bilim*, 36(162), 301-319.
- Berkeley, S., & Larsen, A. (2018). Fostering self-regulation of students with learning disabilities: Insights from 30 years of reading comprehension intervention research. *Learning Disabilities Research & Practice*, 33(2), 75-86.
- Biber, A. Ç., & Tuna, A. (2017). Ortaokul matematik kitaplarındaki öğrenme alanları ve Bloom taksonomisine göre karşılaştırmalı analizi [A comparative analysis of the exercise questions in secondary school mathematics books based on learning domains and Bloom's taxonomy]. *Ondokuz Mayıs Üniversitesi Eğitim Fakültesi Dergisi*, 36(1), 161-174.
- Bigozzi, L., Tarchi, C., Vagnoli, L., Valente, E., & Pinto, G. (2017). Reading fluency as a predictor of school outcomes across grades 4–9. *Frontiers in Psychology*, 8, 200.
- Bowyer-Crane, C., & Snowling, M. J. (2005). Assessing children's inference generation: What do tests of reading comprehension measure?. *British Journal of Educational Psychology*, 75(2), 189-201.
- Cappa, C., & Giolivi, S. (2014). *Dyslang Module 3: Dyslexia across Europe*. University of South Wales. http://dyscovery.research.southwales.ac.uk/media/files/documents/2014-01-16/Module_3.pdf
- Clemens, N. H., Simmons, D., Simmons, L. E., Wang, H., & Kwok, O. M. (2017). The prevalence of reading fluency and vocabulary difficulties among adolescents struggling with reading comprehension. *Journal of Psychoeducational Assessment*, 35(8), 785-798.
- Clure, L. F. (2013). *Teacher judgments of student writing: Examining the accuracy of ratings for the identification of at-risk students* [Unpublished doctoral dissertation]. University of Nebraska-Lincoln.
- Conderman, G., & Strobel, D. (2008). Fluency flyers club: An oral reading fluency intervention program. Preventing School Failure: *Alternative Education for Children and Youth*, 53(1), 15-20.
- Coşkun, Y. D. (2013). Türkçe ders kitaplarının PISA sınavı okuma ölçütleri açısından incelenmesi [Examination of the Turkish textbooks in terms of PISA reading skills criteria]. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, 26, 22-43.
- Çelik, C., Erden, G., Özmen, S., & Tural Hesapçıoğlu, S. (2017). Comparing two editions of Wechsler Intelligence Scales and assessing reading skills in children with attention deficit and hyperactivity disorder. *Turkish Journal of Psychiatry*, 28(2), 104-116.
- Çeliktürk Sezgin, Z. Ç., & Gedikoğlu Özilhan, Y. G. G. (2019). 1.-8. sınıf Türkçe ders kitaplarındaki metne dayalı anlama sorularının incelenmesi [Examining text-based

- comprehension questions in Turkish textbooks of the 1st- the 8st graders]. *Ana Dili Eğitimi Dergisi*, 7(2), 353-367.
- Çetinkaya, G., Ülper, H., & Yağmur, K. (2015). Öğrencilerin doğru ve akıcı sessiz sözcük okuma becerileriyle kavrama başarıları arasındaki ilişki [Relationship between students' accurate and fluent silent word reading skills and their comprehension]. *İlköğretim Online*, 14(3), 993-1004.
- de Araújo Vilhena, D., & Vieira Pinheiro, A. M. (2016). Revised version of the scale of evaluation of reading competence by the teacher: Final validation and standardization. *Universitas Psychologica*, 15(4), 1-13.
- Denton, C. A., Barth, A. E., Fletcher, J. M., Wexler, J., Vaughn, S., Cirino, P. T., Romain, M., & Francis, D. J. (2011). The relations among oral and silent reading fluency and comprehension in middle school: Implications for identification and instruction of students with reading difficulties. *Scientific Studies of Reading*, 15(2), 109-135.
- Dinç, R. (2017). Okuma güçlüğü yaşayan öğrencide okuma becerisini geliştirmeye yönelik bir eylem araştırması [Action research about development of reading and writing skills of dyslexic student]. *Kuramsal Eğitimbilim Dergisi*, 10(2), 320-334.
- Doğan, B. (2013). Türkçe ve sınıf öğretmenlerinin okuma güçlüğüne ilişkin bilgileri ve okuma güçlüğü olan öğrencileri belirleyebilme düzeyleri [Determining Turkish language and elementary classroom teachers' knowledge on dyslexia and their awareness of diagnosing students with dyslexia]. *Okuma Yazma Eğitimi Araştırmaları*, 1(1), 20-33.
- Erden, G., Kurdoglu, F., & Uslu, R. (2002). İlköğretim okullarına devam eden Türk çocuklarının sınıf düzeylerine göre okuma hızı ve yazım hataları normlarının geliştirilmesi [Development of grade level norms for reading speed and writing errors of Turkish elementary school children]. *Türk Psikiyatri Dergisi*, 13(1), 5-13.
- Flynn, J. M., & Rahbar, M. H. (1998). Improving teacher prediction of children at risk for reading failure. *Psychology in the Schools*, 35(2), 163-172.
- Fuchs, L. S., Fuchs, D., Hosp, M. K., & Jenkins, J. R. (2001). Oral reading fluency as an indicator of reading competence: A theoretical, empirical, and historical analysis. *Scientific Studies of Reading*, 5(3), 239-256.
- Gulan, T., & Valerjev, P. (2010). Semantic and related types of priming as a context in word recognition. *Review of Psychology*, 17(1), 53-58.
- Gündüz, Y. (2009). İlköğretim 6, 7 ve 8. sınıf fen ve teknoloji sorularının ölçme araçlarına ve Bloom'un bilişsel alan taksonomisine göre analizi [Analysis of primary school 6, 7 and 8. grades science and technology questions according to measurement scales and Bloom's taxonomy of the cognitive domain]. *Yüzüncü Yıl Üniversitesi Eğitim Fakültesi Dergisi*, 6(2), 150-165.
- Hammill, D. D., Wiederholt, J. L., & Allen, E. A. (2006). *TOSCRF: Test of silent contextual reading fluency*. Pro-Ed.
- Hoover, W. A., & Tunmer, W. E. (1993). The components of reading. In G. B. Thompson, W. E. Tunmer & T. Nicholson (Eds.), *Language and education library: Reading acquisition processes* (pp. 1-19). Multilingual Matters.
- Irwin, J. (2006). *Teaching reading comprehension processes*. Allyn & Bacon.
- Irwin, J. W. (1983). Coherence factors in children's textbooks. *Reading Psychology: An International Quarterly*, 4(1), 11-23.
- Irwin, J. W. (1991). *Teaching reading comprehension processes* (2nd vol.). Prentice Hall.
- İnce, M., & Gözütok, F. D. (2017). Türkçe 6, 7, 8. sınıf ders kitaplarının PISA becerilerine göre incelenmesi [Investigation of Turkish 6th, 7th, 8th grade textbooks according to PISA

- reading literacy]. *Turkish Studies: International Periodical for the Languages, Literature and History of Turkish or Turkic*, 12(33), 213-225.
- Jenkins, J. R., Fuchs, L. S., Van Den Broek, P., Espin, C., & Deno, S. L. (2003). Sources of individual differences in reading comprehension and reading fluency. *Journal of Educational Psychology*, 95(4), 719.
- Kaufman, A. S., & Kaufman, N. L. (2014). *Kaufman test of educational achievement* (3rd ed.). NCS Pearson.
- Kaya, D., & Yıldırım, K. (2016) Dördüncü sınıf öğrencilerin akıcı okumalarının basit ve çıkarımsal anlama düzeylerine göre değerlendirilmesi [Evaluation of fourth grade students' reading fluency skills in regard to deep and literal comprehension levels]. *Ana Dili Eğitimi Dergisi*, 4(3), 416-430.
- Kelso, K., Whitworth, A., Parsons, R., & Leitão, S. (2020). Hidden reading difficulties: Identifying children who are poor comprehenders. *Learning Disability Quarterly*. Advance online publication.
- Khamis, H. (2008). Measures of association: How to choose?. *Journal of Diagnostic Medical Sonography*, 24(3), 155-162.
- Klauda, S. L., & Guthrie, J. T. (2008). Relationships of three components of reading fluency to reading comprehension. *Journal of Educational psychology*, 100(2), 310-321.
- Kodan, H. (2020). Okuma güçlüğüne ilişkin öğretmen görüşleri [Teachers opinions about reading disability]. *Bayburt Eğitim Fakültesi Dergisi*, 15(29), 204-222.
- Kodan, H., & Akyol, H. (2018). Effects of choral, repeated and assisted reading strategies on reading and reading comprehension skills of poor readers. *Education & Science/Eğitim ve Bilim*, 42(193) 159-179.
- Kökçü, Y., & Demirel, Ş. (2017). 5, 6, 7 ve 8. sınıf Türkçe dersi okuma kazanımlarının okuma modelleri ile ilişkisi üzerine bir inceleme [A research on the relation between reading acquisitions of 5, 6, 7 and 8th classes' Turkish courses and models of reading]. *Uluslararası Türkçe Edebiyat Kültür Eğitim Dergisi*, 6(2), 1133-1147.
- Kuhn, M. R., Schwanenflugel, P. J., & Meisinger, E. B. (2010). Aligning theory and assessment of reading fluency: Automaticity, prosody, and definitions of fluency. *Reading Research Quarterly*, 45(2), 230-251.
- Kuruoğlu, G., & Şen, N. (2018). Okuma güçlüğü yaşayan ortaokul öğrencilerin yaptıkları okuma hatalarının incelenmesi [Examination of reading mistakes of secondary school students who have reading difficulties]. *Eğitim Kuram ve Uygulama Araştırmaları Dergisi*, 4(2), 101-110.
- LaBerge, D., & Samuels, S. J. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology*, 6(2), 293-323.
- Lane, H. B., Hudson, R. F., Leite, W. L., Kosanovich, M. L., Strout, M. T., Fenty, N. S., & Wright, T. L. (2008). Teacher knowledge about reading fluency and indicators of students' fluency growth in reading first schools. *Reading & Writing Quarterly*, 25(1), 57-86.
- Lane, K. L., Oakes, W., & Menzies, H. (2010). Systematic screenings to prevent the development of learning and behavior problems: Considerations for practitioners, researchers, and policy makers. *Journal of Disability Policy Studies*, 21(3), 160-172.
- Leach, J., Scarborough, H., & Rescorla, L. (2003). Late-emerging reading disabilities. *Journal of Educational Psychology*, 95, 211-224.
- Lower, A. (2014). *The effects of letter transposition and context on reading: Testing the myth of typoglycemia*. Unpublished manuscript. Retrieved from

<http://nebula.wsimg.com/36c1b5a6f3dedbf89d1729a7f06b9526?AccessKeyId=76A65F2DCAA5C8AA1A83&disposition=0&alloworigin=1>

- Madelaine, A., & Wheldall, K. (2005). Identifying low-progress readers: Comparing teacher judgment with a curriculum-based measurement procedure. *International Journal of Disability, Development and Education*, 52(1), 33-42.
- Meneghetti, C., Carretti, B., & De Beni, R. (2006). Components of reading comprehension and scholastic achievement. *Learning and Individual Differences*, 16(4), 291-301.
- Mercer, C. D., Campbell, K. U., Miller, M. D., Mercer, K. D., & Lane, H. B. (2000). Effects of a reading fluency intervention for middle schoolers with specific learning disabilities. *Learning Disabilities Research & Practice*, 15(4), 179-189.
- Mullis, I. V. S., Martin, M. O., Foy, P., & Drucker, K. T. (2012). *PIRLS 2011 international results in reading*. International Study Center.
- Mullis, I. V. S., Martin, M. O., Gonzalez, E. G., & Kennedy, A. M. (2003). PIRLS 2001 international report: IEA's study of reading literacy achievement in primary school in 35 countries. International Study Center.
- Oney, B., & Goldman, S. R. (1984). Decoding and comprehension skills in Turkish and English: Effects of the regularity of grapheme-phoneme correspondences. *Journal of Educational Psychology*, 76(4), 557-568.
- O'Shaughnessy, T. E., & Lee Swanson, H. (2000). A comparison of two reading interventions for children with reading disabilities. *Journal of Learning Disabilities*, 33(3), 257-277.
- Ouellette, G. P. (2006). What's meaning got to do with it: The role of vocabulary in word reading and reading comprehension. *Journal of Educational Psychology*, 98(3), 554.
- Örge Yaşar, F. (2019). 2018 Türkçe Dersi Öğretim Programına Göre Hazırlanmış 7. Sınıf Türkçe Ders Kitaplarındaki Metinlerin Okuma Yöntem ve Teknikleri Açısından İncelenmesi [Examination of texts in 7th grade Turkish textbooks prepared according to 2018 Turkish lesson education program according to reading method and techniques]. In D. K. Dimitrov, D. Nikoloski, & R. Yılmaz (Eds.) *Proceedings of the XI. International Balkan and Near Eastern Social Sciences Congress Series* (pp. 326-338). Cataloging-In-Publication Data.
- Özcan, S., & Oluk, S. (2007) İlköğretim fen bilgisi derslerinde kullanılan soruların Piaget ve Bloom taksonomisine göre analizi [Analysis of questions used in science lessons at primary school according to Piaget and Bloom taxonomy]. *Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi*, 8, 61- 68.
- Polat, İ., & Dedeoğlu, H. (2020). Sınıf öğretmenlerinin hazırladığı metin altı sorularının incelenmesi [Investigation of text-based reading comprehension questions prepared by primary school teachers]. *Ana Dili Eğitimi Dergisi*, 8(4), 1468-1482.
- Pressley, M. (2000). What should comprehension instruction be the instruction of?. In M.L. Kamil, P.B. Mosenthal, P.D. Pearson & R. Barr (Eds.), *Handbook of reading research* (Vol 3, pp. 545–562). Erlbaum.
- Rasinski, T. V., Chang, S. C., Edmondson, E., Nageldinger, J., Nigh, J., Remark, L., Srsen Kenney, K., Walsh-Moorman, E., Yildirim, K., Nichols, W. D., Paige, D. D., & Rupley, W. H. (2017). Reading fluency and college readiness. *Journal of Adolescent and Adult Literacy*, 60(4), 453–460.
- Rasinski, T. V., Padak, N. D., McKeon, C. A., Wilfong, L. G., Friedauer, J. A., & Heim, P. (2005). Is reading fluency a key for successful high school reading?. *Journal of Adolescent & Adult Literacy*, 49(1), 22-27.
- Ritchey, K. D., Palombo, K., Silverman, R. D., & Speece, D. L. (2017). Effects of an informational text reading comprehension intervention for fifth-grade students. *Learning Disability Quarterly*, 40(2), 68-80.

- Sanacore, J., & Palumbo, A. (2009). Understanding the fourth-grade slump: Our point of view. *The Educational Forum*, 73, 67-74.
- Saracaloğlu, A., Dedeşali, N. C., & Karasakaloğlu, N. (2011). Sekizinci sınıf öğrencilerinin sessiz okuma hızları ve okuduğunu anlama düzeyleri [The 8th grade students' speeds silent reading and levels of reading comprehension]. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi*, 12(3), 177-193.
- Saraçlı Çelik, S. (2019). *İlkokul 4. sınıf öğrencilerinin doğru ve akıcı sessiz sözcük okuma düzeyinin öğrencilerin okuduğunu anlama becerisi ve okuma motivasyonu ile ilişkisi* [Correlation between 4th grade primary school students' level of correct and fluent silence word reading and reading comprehension skills and reading motivation] [Unpublished master's thesis]. Menderes Üniversitesi.
- Sarar Kuzu, T. (2013). Türkçe ders kitaplarındaki metin altı sorularının yenilenmiş Bloom taksonomisindeki hatırlama ve anlama bilişsel düzeyleri açısından incelenmesi [Investigation of the text following questions in Turkish course books with respect to their remembering and understanding cognition levels of the revised Bloom taxonomy]. *Cumhuriyet Üniversitesi Sosyal Bilimler Dergisi*, 37(1), 58-76.
- Savaş, B. (2017). Yazma öğretiminin ilköğretim öğrencilerinin okuma-anlama becerileri üzerine etkilerinin incelenmesi: Dilbilimsel bir yaklaşım [An analysis of the influences of handwriting teaching on reading comprehension skills of primary school students: A linguistic approach]. *Uluslararası Eğitim Bilimleri Dergisi*, 13, 120-140.
- Schleicher, A., Zimmer, K., Evans, J., & Clements, N. (2009). *PISA 2009 assessment framework: Key competencies in reading, mathematics and science*. OECD Publishing.
- Schrank, F. A., Mather, N., & McGrew, K. S. (2014). *Woodcock-Johnson IV Tests of Achievement*. Riverside.
- Share, D. L. (2008). On the Anglocentricities of current reading research and practice: The perils of overreliance on an "outlier" orthography. *Psychological Bulletin*, 134(4), 584.
- Sidekli, S. (2010). Eylem araştırması: İlköğretim dördüncü sınıf öğrencilerinin okuma ve anlama güçlüklerinin giderilmesi [Action research: Compensation of reading and comprehension difficulties of fourth grade elementary school children]. *TÜBAR*, 27, 563-580.
- Soriano, M., Miranda, A., Soriano, E., Nievas, F., & Félix, V. (2011). Examining the efficacy of an intervention to improve fluency and reading comprehension in Spanish children with reading disabilities. *International Journal of Disability, Development and Education*, 58(1), 47-59.
- Taştekinöğlü, E., & Aydın, G. (2014). 4. sınıf matematik sınav sorularının TIMSS 2011 bilişsel alanları ve öğretim programlarıyla karşılaştırılması [A comparison of 4th grade math exam questions with the cognitive areas and the education programs of TIMSS 2011]. In N. Kayar & Ü. Güneş (Eds.), *III. Türkiye Lisansüstü Çalışmalar Kongresi Bildiriler Kitabı* (Vol 1, pp. 247-264). Sakarya Üniversitesi Basımevi.
- Terziyan, T. L., & Yıldız, E. (2020). *Türkçede telaffuz edildiği gibi yazılmayan kelimeler* [Words that are not spelled in the manner they are pronounced in Turkish] [Manuscript submitted for publication]. Department of Culture Studies, Tilburg University & School of Foreign Languages, Yıldız Teknik University.
- Torgeson, J. K., Wagner, R. K., Lonigan, C. J., & DeGraff, A. (2002). Test of critical early reading skills [Unpublished manuscript]. Department of Psychology, Florida State University.
- Torppa, M., Georgiou, G. K., Lerkkanen, M. K., Niemi, P., Poikkeus, A. M., & Nurmi, J. E. (2016). Examining the simple view of reading in a transparent orthography: A longitudinal study from kindergarten to Grade 3. *Merrill-Palmer Quarterly*, 62, 179-206.

- Torppa, M., Vasalampi, K., Eklund, K., Sulkunen, S., & Niemi, P. (2020). Reading comprehension difficulty is often distinct from difficulty in reading fluency and accompanied with problems in motivation and school well-being. *Educational Psychology, 40*(1), 62-81.
- Tüm, G. (2016). 5. ve 6. sınıf ilköğretim Türkçe ders kitaplarında yer alan metin önu ve sonu sorularının Bloom taksonomisi'ne göre değerlendirilmesi [An evaluation of pre- and post-reading questions in the 5th and 6th grade Turkish books, used in the primary and secondary education in terms of Bloom's taxonomy]. *Turkish Studies: International Periodical for the Languages, Literature and History of Turkish or Turkic, 11*(14), 731-748.
- Türkmenoğlu, M., & Baştuğ, M. (2017). İlkokulda akran öğretimi aracılığıyla okuma güçlüğünün giderilmesi [The overcoming reading difficulty through peer tutoring in primary school]. *Eğitimde Nitel Araştırmalar Dergisi, 5*(3), 36-66.
- Ülper, H., & Yağmur, K. (2016). Akıcı Sessiz Sözcük Okuma Testinin Geliştirilmesi [Developing silent word reading fluency test]. *İlköğretim Online, 15*(2), 581-593.
- Ülper, H., Çetinkaya, G., & Bayat, N. (2017). Okuduğunu anlama testinin geliştirilmesi [Developing reading comprehension test]. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi, 18*(1), 175-187.
- Wagner, R. C., Torgesen, J. K., Rashotte, C. A., & Pearson, N. A. (2010). *Test of silent reading efficiency and comprehension*. Pro Ed.
- Whitten, C., Labby, S., & Sullivan, S. L. (2016). The impact of pleasure reading on academic success. *Journal of Multidisciplinary Graduate Research, 2*(1), 48-64.
- Williams, J. P. (1993). Comprehension of students with and without learning disabilities: Identification of narrative themes and idiosyncratic text representations. *Journal of Educational Psychology, 85*(4), 631-641.
- Winters, R., Winters, A., & Amedee, R. G. (2010). Statistics: A brief overview. *Ochsner Journal, 10*(3), 213-216.
- Yıldırım, K., & Ateş, S. (2012). Silent and oral reading fluency: Which one is the best predictor of reading comprehension of Turkish elementary students. *International Journal on New Trends in Education and Their Implications, 3*(4), 79-91.
- Young, C., Mohr, K. A., & Rasinski, T. (2015). Reading together: A successful reading fluency intervention. *Literacy Research and Instruction, 54*(1), 67-81.
- Ziegler, J. C., & Goswami, U. (2006). Becoming literate in different languages: Similar problems, different solutions. *Developmental Science, 9*(5), 429-436.