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Fluency and comprehension of narrative texts in Turkish students in grades 4 through 8

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ABSTRACT

The present study attempted to extend our knowledge of the role of reading fluency in contributing to reading comprehension among Turkish students in grades 4 through 8. One hundred students at each grade level were administered assessments of reading fluency, word recognition automaticity and prosody, and silent reading comprehension. Word recognition automaticity was found to be a significant predictor of comprehension at all grade levels tested. Prosody predicted comprehension at all grades levels except grade 4. Regression analyses at each grade level indicate that, except for grade 4, word recognition automaticity and prosody, together contribute to the prediction of reading comprehension. The magnitude of fluency's prediction of comprehension ranged from approximately a quarter to a third of comprehension. The results are discussed in terms of policy and instructional changes that may be considered for reading instruction for Turkish students.

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In recent years, there has been increased attention to reading fluency in Turkey. Unfortunately, despite significant efforts at the local and national levels, a large number of students in Turkey continue to struggle in reading fluency and overall reading proficiency. Reading fluency is necessary for reading comprehension as well as for academic success. The ability to read connected text fluently is one of the essential requirements for successful reading comprehension (Kim, Wagner, and Foster 2011). Strong theoretical and empirical support exists for reading fluency as a crucial component in reading comprehension. Indeed, Pikulski and Chard (2005) described reading fluency as the bridge between decoding and reading comprehension. The purpose of the present study is to review the literature related to the relationship between reading fluency and reading comprehension from the Turkish language context and shed greater light on the relationship between reading fluency and reading comprehension based on the developmental nature of reading in Turkish students from fourth grade through eighth grade.

Recent research in reading education has identified reading fluency as a critical and essential reading competency that is necessary for full proficiency in reading in English. The National Reading Panel (2000) as well as more recent reviews of research (Chard, Vaughn, and Tyler 2002; Kuhn, Schwanenflugel, and Meisinger 2010; Kuhn and Stahl 2003; Rasinski et al. 2011) have noted the importance of reading fluency as foundational for reading growth and should be mastered in the elementary grades. Research has further demonstrated that reading fluency, comprehension, and overall reading success are highly correlated (Daane et al. 2005; Miller and

Schwanenflugel 2008; Pinnell et al. 1995; Wiley and Deno 2005). Thus, reading fluency is an important contributor to comprehension, overall reading achievement, and school success (Lane et al. 2008).

Students who struggle in reading often manifest difficulty in reading fluency. Approximately 75% of American students struggle in high stakes tests of reading achievement in the US demonstrate difficulty in one or more components of reading fluency (word recognition accuracy, word recognition automaticity, and reading prosody) (Valencia and Buly 2004). Moreover, other research has shown many English-speaking students beyond the elementary grades continue to struggle in reading fluency and that measures of reading fluency continue to be highly correlated with overall reading proficiency (Paige et al. 2014; Paige, Rasinski, and Magpuri-Lavell 2012; Rasinski et al. 2005).

Reading fluency is defined as consisting of two major components – accurate and automatic word recognition (referred in this paper to automatic word recognition), and expressiveness, or prosody, in oral reading. Automatic word recognition refers to ability of readers to decode words accurately and so effortlessly that they can direct their limited cognitive resources to comprehension, the ultimate goal of reading (LaBerge and Samuels 1974). It is not sufficient for students to be able to decode words accurately as is the goal of phonics instruction. Although phonics instruction leads readers to accurately identifying words, the process of analysing or ‘sounding out words’ takes up a considerable amount of attention, or cognitive resources, that could otherwise be devoted to making meaning.

The other component of fluency harkens back to the early days of reading instruction – recitation, elocution, or expression. Fluent speakers and readers speak or read orally with appropriate expression that reflects and even enhances the meaning of the text. Expression is easily measured – simply listen to students read orally and rate them on an oral expression rubric.

Research has found that American readers who read with good expression when reading orally tend to be the best comprehenders when reading silently. Moreover, as readers decline in their oral reading expression, their silent reading comprehension also declines. This correlation has been found for students from the elementary grades through high school (Pinnell et al. 1995; Daane et al. 2005; Rasinski, Rikli, and Johnston 2009).

Both components of fluency are important because they are a prerequisite to more sophisticated levels of reading – comprehension (Rasinski 2012). Once students are able to read words in texts accurately, automatically, and with expression (prosody) that reflects meaning, they are more able to focus their cognitive resources on making meaning – comprehension— rather than on the more basic and foundational competency in reading – word recognition.

Despite the growing understanding and recognition of reading fluency in reading English, the role of reading fluency in other languages is limited. The present study examines the role of reading fluency and reading comprehension in Turkish.

Reading is one of the learning domains in the national language arts curriculum for the elementary grades in Turkey. The Turkish language arts course of study embodies constructivism, student-centred learning approaches, individual differences, multiple intelligences, brain compatible learning, skill, and thematic-based learning. Reading instruction for elementary students includes teaching foundational reading competencies first. Attention is given to having students acquire certain competencies such as readiness for reading, word recognition, vocabulary, determining general purpose for reading. Then, the objectives relative to reading comprehension skills are taught to students. Additionally, some objectives related to intertextuality and using various strategies to improve vocabulary are also included in reading instruction for students. Moreover, a variety of reading purposes such as reading for recreation, independent reading, critical reading, informative reading, and so forth are represented in the Turkish of the study (Republic of Turkey Ministry of National Education [RoTMoNE] 2005). However, reading fluency has only recently received some degree of attention in the Turkish language arts curriculum. Given the recent recognition of the role of fluency in English reading instruction, there does not exist a solid body of research that explores this competency in Turkish children. In addition, existing elementary school curriculum programmes in reading and

language arts in Turkey do not put sufficient stress on reading fluency (RoTMoNE 2005). Compared to the 2005 curriculum, while the revised Turkish language arts curriculum (RoTMoNE 2015) gives more attention to reading fluency, it may be the case that there continues to be a gap between the curriculum requirements and teachers' actual practices in classrooms related to reading fluency instruction. The low mean scores of Turkish students based on reading domain from Programme for International Student Assessment (PISA) also provide a convincing argument that the curriculum is not fully represented in teachers' practices do not support each other (Organisation for Economic Co-operation and Development [OECD] 2015).

Given the growing recognition of the importance of fluency in reading and its lack of scholarly inquiry among students in Turkey, it is clear that a need for more research focusing on fluency, its various components, and its relationship to reading comprehension in Turkish students exists. Fluency in reading Turkish is defined similarly as in English – accuracy and automaticity in word recognition and prosody in oral reading. Considering the literature relevant to reading fluency in Turkey, although there have been a limited number of studies investigating the relationship between reading fluency components and reading comprehension in elementary school grades (Bastug and Akyol 2012; Kaya and Yildirim 2016; Yildiz et al. 2009, 2014; Yildirim and Ates 2012; Yildirim and Rasinski 2014), they have not focused on the developmental processes over time and relationships between reading fluency and reading comprehension from the elementary to middle grades.

Purpose

In this research, the researchers investigated the relationship between components of reading fluency and reading comprehension. The main research questions addressed in this investigation are:

What is the relationship among components of reading fluency and reading comprehension or narrative texts in Turkish students in grades 4, 5, 6, 7, and 8?

How does the relationship between the components of fluency and comprehension change from grades 4 through 7?

Procedures

The present study aimed to explore the relations among the components of reading fluency and narrative reading comprehension among Turkish students. A total of 100 students from every grade level ranging 4th to 8th were enrolled in the study. This research took place in fall semester, 2015, in Turkey's Denizli province. The participants from all the grade levels were willing and available to take part in the present study. Informed consent letters were obtained from all of the participants and their parents or guardians. The participants were relatively homogenous and of middle socio-economic status. They ranged in age from 10 through 15 years. The participants were not identified as learning disabled and their reading development was felt to be within grade level expectations according to their classroom teachers and the school counsellor. All of the participants in the research were considered typically developing readers by their teachers. The predominant language (native language) of the students from all grade levels was Turkish; the students were not fluent speakers of English.

Students were asked to read a grade-appropriate narrative text and answer a set of comprehension questions related to the passage. The texts for reading comprehension and the component of reading fluency from all grade levels were chosen from a collection of graded Turkish narrative texts (Akyol et al. 2014). We employed measures of reading comprehension, developed by the authors of the present study in Turkish. Twelve comprehension questions were prepared for every text, of which half were literal and half inferential. Every test consisted of 12 questions included multiple-choice and open-ended questions. The actual student reading had a fixed time condition, as previous research has shown that additional/unlimited time did not enhance the performance of nondisabled students

and fixed time limits allowed ample time for the great majority of students to complete the test (e.g. Alster 1997; Bridgeman, Trapani, and Curley 2004).

Prior to the study, the texts and accompanying questions were reviewed by the experts in reading education to the extent to which the texts adequately corresponded to reading domain objectives of the grade levels Turkish language arts curriculum and the questions adequately measured comprehension of the texts. The experts also verified that each comprehension question was appropriate to test development standards and the students' reading levels. Correct responses to each question were scored as 1 point, and incorrect answers were scored as 0 points. Total scores ranged from 0 to 12. In the present study, we used Kuder–Richardson Formula 20 (KR20) as a measure of internal consistency reliability for measures with dichotomous choices. Although Cronbach's alpha is usually used for scores that fall along a continuum, it will produce the same results as KR20 with dichotomous data (0 or 1) (Cortina 1993; Kuder and Richardson 1937; Tabachnick and Fidell 2007). The comprehension tests' internal consistency reliabilities ranged from .70 to .82 KR20 coefficients for the total of 12 questions. This coefficient values indicated that the scores obtained from the comprehension tests had acceptable internal consistency and the scores of the students from the tests had a homogeneous construct.

Students were tested individually and asked to read orally the passage corresponding to their grade level placement. The students were asked to read the text in their best or most expressive voice and were alerted that they would be asked questions about what they had read following their reading. During the oral reading, the researcher administering the test marked any uncorrected word recognition errors made by the student as well as marking the text position of the student at the end of one minute of reading in order to determine reading rate, a measure of word recognition automaticity.

Prosody or expressive reading, a second element of fluency, was measured by independent evaluators listening to the student reading of the grade level text and then rating the prosodic quality of the oral reading using a multi-dimensional fluency scale or rubric that describes levels of competency on various elements of prosody: expression and volume, phrasing, smoothness, and pace (Rasinski 2004). The rubric was adaptation of a rubric by Zutell and Rasinski (1991) and subsequently adapted by Yildiz et al. (2009) for Turkish students. Previous research with readers of English has demonstrated the rubric to be a reliable and valid measure of prosody (Paige, Rasinski, and Magpuri-Lavell 2012; Rasinski, Homan, and Biggs 2009). The Turkish adaptation of the scale has the following four domains: (a) expression and volume, (b) phrasing, (c) smoothness, and (d) pace. Students' scores can range between a minimum of 4 and a maximum of 16.

Results

Data obtained from the students' reading or narrative texts included measures of word recognition automaticity (words read correctly per minute), prosody (rating of expressiveness using the multi-dimensional fluency scale – scores ranged from 4 to 16), and answers to comprehension questions (scores ranged from 0 to 12). Means and standard deviations for the three variables are presented in Table 1. Scores of all three variables had a general tendency to decline as grade level increased.

In order to determine the relationship between measures of fluency and comprehension correlations were calculated among the key variables by grade level and are presented in Table 2. All correlations, save one, were found to be statistically significant and substantial.

Given the robust correlations between the automaticity and prosody, the two components of fluency, we ran multiple regression analyses at each grade level to determine the combined relationship of the fluency variables and comprehension. Those results are presented below.

A multiple regression analysis was used to test the extent to which both prosody and automaticity combined predicted fourth grade students' reading comprehension. The results of the regression indicated that the independent variables of the model statistically predicted reading comprehension ($R^2 = .09$, $F(2, 97) = 4.557$, $p < .05$). While automaticity made statistically significant contribution to the

Table 1. Means and standard deviations for word recognition automaticity, prosody, and comprehension by grade level.

Grade		<i>N</i>	<i>M</i>	<i>SD</i>
4	Comprehension	100	7.54	2.20
	Prosody	100	13.73	1.75
	Automaticity	100	98.46	18.94
5	Comprehension	100	6.91	2.35
	Prosody	100	11.53	2.76
	Automaticity	100	96.04	24.49
6	Comprehension	100	5.91	2.12
	Prosody	100	13.13	2.35
	Automaticity	100	114.38	25.36
7	Comprehension	100	4.96	1.80
	Prosody	100	12.75	2.63
	Automaticity	100	111.17	26.19
8	Comprehension	100	4.13	1.63
	Prosody	100	11.99	2.48
	Automaticity	100	109.97	33.84

Note: Automaticity: words read correctly per minute; Prosody: rating on prosody rubric, Range 4–16; Comprehension: number of questions from passage answered correctly, Range 0–12.

prediction of reading comprehension ($t = 2.771, p < .05$), reading prosody did not make statistically significant contribution to the prediction of reading comprehension ($t = -.500, p > .05$).

A multiple regression analysis was used to test the extent to which both prosody and automaticity combined predicted the fifth grade students' reading comprehension. The results of the regression indicated that the independent variables of the model statistically predicted reading comprehension ($R^2 = .27, F(2, 97) = 17.961, p < .001$). Automaticity and prosody both made statistically significant contributions to the prediction of reading comprehension – automaticity ($t = 2.369, p < .05$) and prosody ($t = 3.059, p < .05$). The regression analyses suggest that both fluency components predict 27% of the variation in reading comprehension.

A multiple regression analysis was used to test the extent to which both prosody and automaticity combined predicted the sixth grade students' reading comprehension. The results of the regression indicated that the independent variables of the model statistically predicted reading comprehension ($R^2 = .29, F(2, 97) = 19.60, p < .001$). Automaticity made statistically significant contribution to the prediction of reading comprehension ($t = 2.452, p < .05$). Reading prosody also made statistically significant contribution to the prediction of reading comprehension ($t = 3.241, p < .05$). Together, both fluency variables predicted 29% of the variation in reading comprehension.

A multiple regression analysis was used to test the extent to which both prosody and automaticity combined predicted the seventh grade students' reading comprehension. The results of the regression indicated that the independent variables of the model statistically predicted reading comprehension ($R^2 = .28, F(2, 97) = 19.269, p < .001$). Automaticity made statistically significant contribution to the prediction of reading comprehension ($t = 3.101, p < .05$), and reading prosody made statistically significant contribution to the prediction of reading comprehension ($t = 2.064, p < .05$). The fluency variables combined predicted 28% of the variation in reading comprehension.

A multiple regression analysis was used to test the extent to which both prosody and automaticity combined predicted the eighth grade students' reading comprehension. The results of the

Table 2. Correlations between measures of fluency and comprehension.

Grade	Automaticity–Comprehension	Prosody–Comprehension
4	.30**	.11
5	.45**	.48**
6	.46**	.49**
7	.50**	.46**
8	.56**	.50**

** $p < .01$.

regression indicated that the independent variables of the model statistically predicted reading comprehension ($R^2 = .35$, $F(2, 97) = 26.543$, $p < .001$). Both automaticity ($t = 4.018$, $p < .001$) and prosody ($t = 2.492$, $p < .05$) made statistically significant contribution to the prediction of reading comprehension. Combined, the two fluency variables accounted for 35% of the variation in comprehension.

Discussion

The results of the present study provide productive insights into the reading performance of the Turkish students who were part of the study. First and foremost, the results indicate that reading fluency, including both of its constituent elements, is substantially related to reading comprehension of narrative texts (Table 2). At all grade levels, higher levels of fluency are associated with higher levels of comprehension.

Regression analyses (Tables 3–7) indicate that the contribution of fluency to the prediction of reading comprehension was substantial and ranged from 9% to 35%, and generally increased with grade level. Despite models of reading development that suggest that fluency is an instructional competency developed in the early elementary grades (Chall 1996), the results of the present study suggest that the role of fluency in predicting reading comprehension continues past the primary grades and may actually increase as students move to more advanced grades and must read more challenging texts. The present results suggest that fluency is a reading competency that continues to remain significant for Turkish students through grade 8, and perhaps beyond. As students move from one grade level to another, the difficulty of the narrative texts they are asked to read increase in difficulty and complexity. As the difficulty of Turkish narrative texts increases, the level of fluency required to read the text successfully also increases. These results are consistent with the findings from the other studies where reading fluency has been correlated with reading comprehension of English texts at various grade levels (e.g. Fuchs et al. 2001; Kim, Wagner, and Foster 2011; Klauda and Guthrie 2008; Santos et al. 2017; Schimmel and Ness 2017; Solari et al. 2017).

Analyses of literacy curricula guides for Turkish as well as observations of Turkish literacy classrooms suggest that reading fluency is not an instructional priority. Students are taught word recognition accuracy, but little intentional instruction is given to developing word recognition automaticity and even less to reading prosody (Ates and Yildirim 2014, 2015; Yildirim, Cetinkaya, and Ates 2013). Although correlation, such as what is found in the present study, does not imply causation, given the theoretical connection between fluency and comprehension in English as well as evidence from research into instruction in fluency and its impact on comprehension and overall reading achievement in English (Rasinski et al. 2011), improvements in reading fluency among Turkish students in grades 4 through 8 are likely to yield improvements in reading comprehension and overall reading achievement. Considering the literature exploring the relationship between reading fluency and reading comprehension, many empirical studies reported that there are moderate to high positive correlations between reading fluency and reading comprehension. Moreover, these correlations occur from elementary to high schools (as cited in Klauda and Guthrie 2008). In another study, Kim, Wagner, and Lopez (2012) investigated the developmental relations between reading fluency and reading comprehension from first grade to second grade. The findings of the research also revealed that while list reading fluency was related to reading comprehension in first grade, text reading fluency was related to reading comprehension in second grade.

Table 3. Summary of multiple regression analysis for variables predicting reading comprehension in fourth grade ($N = 100$).

Variable	<i>B</i>	SE <i>B</i>	β
Automaticity	.08	.01	.32*
Prosody	-.07	.14	-.06

* $p < .05$.

Table 4. Summary of multiple regression analysis for variables predicting reading comprehension in fifth grade ($N = 100$).

Variable	B	SE B	β
Automaticity	.02	.01	.25*
Prosody	.28	.09	.32*

* $p < .05$.

Interestingly, the fluency measures, particularly word recognition automaticity, demonstrate a general decline from grades 4 through 8. This decline is in marked contrast to word recognition automaticity norms found for English where norms for automaticity demonstrate a consistent increase from grades 1 through 8. Although there are several possible explanations for this observation, including the limited and selected size of the sample, another possible explanation is the lack of emphasis given to reading fluency instruction in grades 5 through 8. Declines in word recognition automaticity accelerate as students move to higher grade levels and more challenging texts. Álvarez-Cañizo, Suárez-Coalla, and Cuetos (2018) suggest that a lack of reading experiences for students may be responsible for this decline. The same phenomena may have occurred in the present research which resulted in the decline of word recognition automaticity on reading comprehension in the upper grades. Additionally, the decrease in word recognition automaticity in upper grades could be explained from developmental nature of reading. Given the developmental nature of reading, simple view of reading (SVR) (Hoover and Gough 1990) and the models supporting this theory – the direct and inferential mediation model (Cromley and Azevedo 2007) and the direct and indirect effects model of reading (Kim 2017) – it may be argued that decoding and linguistic comprehension underlie reading comprehension. Together, the SVR holds that decoding and linguistic comprehension are necessary, though not independently sufficient, to facilitate reading comprehension. Researchers have (as cited in Stanley, Petscher, and Catts 2018) documented how the roles of the fundamental components of the SVR (i.e. linguistic comprehension and decoding) may change over time. Researchers monitored reading progress through a variety of measures in students beginning in early elementary school through the middle school grades. While the measures of decoding skills and listening comprehension together explained a significant amount of variance of reading comprehension in each grade analysed, the contribution of each skill varied over time. More specifically, listening comprehension explained increasing amounts of variance in reading comprehension over time, while decoding skills came to explain less variance in reading comprehension as children progressed from second grade through eighth grade. The researchers recommended some compelling reasons for these findings. One reason is that reading comprehension requires additional and higher thinking skills which may support reading comprehension for secondary school readers (as cited in Stanley, Petscher, and Catts 2018) while because word recognition automaticity is a constrained variable (readers generally reach a ceiling in their word recognition accuracy and automaticity) the effects of word recognition on reading comprehension in the upper grades in the present study declines.

Multiple regression analyses (Tables 3–7) demonstrate that, except for grade 4, word recognition automaticity and prosody separately predict (or contribute to) students' reading comprehension. Again, this suggests that although both automaticity and prosody are distinct elements of reading fluency and need to be part of any reading instruction curriculum beyond the primary grades. However, because prosody is normally associated with oral and since oral reading is diminished in

Table 5. Summary of multiple regression analysis for variables predicting reading comprehension in sixth grade ($n = 100$).

Variable	B	SE B	β
Automaticity	.02	.01	.26*
Prosody	.31	.09	.34*

* $p < .05$.

Table 6. Summary of multiple regression analysis for variables predicting reading comprehension in seventh grade ($N = 100$).

Variable	<i>B</i>	SE <i>B</i>	β
Automaticity	.02	.01	.35*
Prosody	.16	.08	.23*

* $p < .05$.**Table 7.** Summary of multiple regression analysis for variables predicting reading comprehension in eighth grade ($N = 100$).

Variable	<i>B</i>	SE <i>B</i>	β
Automaticity	.02	.01	.41***
Prosody	.17	.07	.25*

* $p < .05$.*** $p < .001$.

its importance in the upper elementary and middle grades, prosody instruction beyond the primary grades in current school reading curricula is generally missing.

Overall, the present study, as in reading English, demonstrates that reading fluency is a significant variable for predicting reading comprehension in grades 4 through 8. As such, a reasonable implication for this conclusion is that reading fluency, both automaticity and prosody, need to be included and emphasised in instructional programmes for teaching reading of narrative texts. Policy-makers of reading curriculum guides in Turkey, as well as literacy specialists, school administrators, and teachers of reading in Turkey, need to examine the extent to which fluency is, or is not, included in Turkish reading curriculum in grades 4 through 8. If fluency has not been adequately addressed in the curricula, then efforts should be made to make fluency a more significant part of such curricula. In English, research and scholarly opinion has identified modelling fluent reading, assisted reading, wide reading, repeated reading, and instruction in phrasing texts into syntactically appropriate units as instructional approach for improving students' fluency and overall reading achievement (Rasinski 2010). Future research in the Turkish should explore the extent to which the same instructional variables can lead to improved outcomes in fluency and reading achievement for Turkish students.

Certainly, there are limitations to our research that need to be acknowledged. First, although the samples of students in the study are relatively large ($n = 100$ per grade level), they represent students from one school which itself represents a very limited socioeconomic segment in Turkey. Moreover, the samples represent students for whom permission was granted by parents for their participation. Students whose parents did not provide permission, for whatever reason, were not included in the study. Our second limitation concerns the texts employed in study. While efforts were made to insure that the texts were good representations of grade level appropriate narrative texts, the fact that students read only one passage limits our ability to generalise to other narrative passages. These limitations can be addressed in future studies that include other samplings of students as well as other passages.

Our main purpose of the present study was to determine if reading fluency was associated with reading achievement in Turkish students reading narrative texts. The results of the study suggest strongly that fluency in reading narrative texts is a salient instructional variable in grades 4 through 8 and should be considered for inclusion in instructional reading curricula for Turkish students at those grade levels. Our hope is that improving fluency in grades 4 through 8 will lead to improved comprehension and overall reading achievement in these grade levels as well.

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