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Relationships between Turkish Eighth-Grade Students' Oral Reading Efficacy, Reading Comprehension and Achievement Scores on a High-Stakes Achievement Test

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RELATIONSHIPS BETWEEN TURKISH EIGHTH-GRADE STUDENTS' ORAL READING EFFICACY, READING COMPREHENSION AND ACHIEVEMENT SCORES ON A HIGH-STAKES ACHIEVEMENT TEST*

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The present study aimed to explore the relation between students' oral reading efficacy, reading comprehension, and academic performance on a nationwide high school placement exam (TEOG). The students were selected from a public middle school. The students' oral reading efficacy, comprehension, and TEOG achievement scores were obtained to figure out the relations between them. The students' TEOG results were obtained from the school administration. The findings revealed that there were statistically significant relations between oral reading efficacy, reading comprehension and TEOG

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achievements. Particularly, students' reading comprehension and accuracy skills together explained 57% of variance in overall TEOG achievements.

The use of high-stakes tests to assess students' achievement has increased in recent years due to their recognition as being fair (Afflerbach, 2016) and scientific (Rotberg, 2006) and for their ability to provide immediate feedback (Hirsch, 2007) and monitor and motivate teachers (Ballard & Bates, 2008; Barksdale-Ladd & Thomas, 2000; Cizek, 2001; Kearns, 2016; Putwain et al., 2016). However, negative effects have also been suggested with high-stakes tests, such as teachers overly focusing instruction on material that is expected to be tested (Cimbricz, 2002; Marchant, 2004; Paris & Urdan, 2000) or dedicating class time to test preparation rather than critical literacy and academic skills (Yildiz, Yildirim, & Ates, 2009). In Turkey, the Turkish High School Placement Exam (TEOG) was introduced in 2013 as a means to determine which high school an eighth-grade student could enroll in. Introduction of this test has been controversial (e.g. test canceled in 2017), but has followed the trend of increased use of standardized testing in other developed countries, such as the United States (e.g. No Child Left Behind Act of 2001). Due to relatively new use of this test, it is crucial to determine that this test not only measures specific subject knowledge, but also gauges general critical skills. Thus, the purpose of this research is to understand and explain how students' reading skills, reading comprehension (Hirsch, 2007), and oral reading efficacy (speed and accuracy), predict their achievement in different subjects and overall performance in a high-stakes test. Some researchers argue that students who develop effective reading skills are more likely to become successful later on (e.g. Beal, Adams, & Cohen, 2010; Korpershoek, Kuyper, & Werf, 2015) and have more developed cognitive processes (Pretorius, 2000); therefore, a deeper understanding of which reading skills are related to academic achievement on a high-stakes exam could have critical implications for instruction and educational policy.

Oral Reading Efficacy

The simple view of reading (SVR), which has been defended in many languages (as cited in Kim, 2017), argues that the ability to comprehend text depends on decoding skills and linguistic

comprehension (Georgiou, Parilla, & Papadopoulos, 2008; Hoover & Gough, 1990). Oral reading efficacy, defined in the current article as the ability to word recognition automaticity (reading speed) and accuracy (see Kuhn, Schwanenflugel, & Meisinger, 2010; Vilger, 2008; Zutell & Rasinski, 1991; for definitions of oral reading fluency, defined as automaticity-speed, accuracy, and prosody), is a necessary skill that bridges decoding to reading comprehension (Acat, 1996; Acquavita, 2012; Basaran, 2013; Bastug, 2012; Bastug & Akyol, 2010; Bastug & Keskin, 2012; Cetinkaya, Ulper, & Yagmur, 2015; Guldenoglu, Kargin, & Miller, 2012; Nunez, 2009; Rasinski, 2004; Rasinski, Samuels, Hiebert, Petscher, & Feller, 2011; Riedel, 2007). It is hyposthesized that once word decoding becomes accurate and automatic, more attention is available for deeper analysis (Armbruster, Lehr, & Osborn, 2001; Fuchs, Fuchs, Hosp, & Jenkins, 2001; Pikulski & Chard, 2005), such as extracting meaning (Armbruster et al., 2001).

Oral Reading Efficacy and Reading Comprehension's Relationship with Subject Matter Achievement

There are number of studies exploring the relation between oral reading efficacy and reading comprehension with subject knowledge. For example, Buck and Torgesen (2003) explored relationships between reading efficacy, reading comprehension, and mathematics performances in third graders and found significant correlation between reading comprehension and mathematics ($r = 0.70$, $p < .001$) and oral reading efficacy and mathematics ($r = 0.53$, $p < .001$). Akay (2004) compared second graders' reading comprehension with problem-solving skills in mathematics and found that students with high reading comprehension appeared to be effective problem solvers. These findings have been replicated with both elementary (Björn, Aunola, & Nurmi, 2016; Cimmiyotti, 2013; Vilenius-Tuohimaa, Aunola, & Nurmi, 2008) and middle school children (Kivrak, 2014; Ozdemir & Sertsoz, 2006). Reading comprehension skills may act as a necessary, but not sufficient condition, that predicts students' performance in mathematics (Anjum, 2015), especially problem solving and data interpretation (Grimm, 2008).

In addition to mathematics, research suggests that reading comprehension and efficacy are also related to students' achievement in science (Ilhan, 2014; Obali, 2009; Ratliff, 2007), language arts (Yilmaz, 2011), and overall academic achievement (Ates, 2008; Bastug, 2014). Yilmaz (2011) found that the relation between students' reading comprehension scores and mathematics ($r = 0.76$) was similar to the relation between reading comprehension and Turkish language arts ($r = 0.75$). Yildiz (2013) found that students' reading motivation, oral reading efficacy, and reading comprehension explained 61% of their general academic performance. On the other hand, Doupone-Horvat (2004) found no significant correlation between reading performance of third graders on their overall school achievement. However, in spite of these findings, there appears to be an overall consensus that oral reading efficacy and comprehension are related to students' academic success.

Oral Reading Efficacy Relation with Language Opacity and Reading Development

Turkish is considered to have a highly transparent language (Oney & Durgunoglu, 1997) meaning that each letter in the alphabet represents a single phone with no allophonic variation other than minimal phonetic changes due to neighboring sounds. Research thus far suggests that readers of transparent languages develop reading skills at different rates than readers of opaque languages (e.g. English, French) (Hengeveld & Leufkens, 2018).

To continue expanding the understanding of this relationship, it is necessary to conduct research in languages with varying degrees orthography consistency on readers at different stages of development. To the best of the authors' knowledge, no research has yet been conducted on older middle school transparent language students' oral reading efficacy and reading comprehension, let alone on how these skills may predict subject and overall achievement on a high-stakes exam. An enhanced understanding of this relationship may give insight as to which skills instructors should emphasize to best prepare

their students, especially for examinations that plays a large role in future schooling and studies.

Research Questions

Based on the reviewed research, there appears to be important relationships between oral reading efficacy, reading comprehension, and subject knowledge and overall achievement on standardized tests. However, there is still limited research in this area, especially in regard to eighth-grade students, as these relationships may vary by grade and language development (e.g. Denton et al., 2011; Kim, Petscher, Schatschneider, & Foorman, 2010; Kim, Wagner, & Lopez, 2012; Lai, George Benjamin, Schwanenflugel, & Kuhn, 2014; Miller & Schwanenflugel, 2008). Additional research may expand the understanding of these relationships and help instructors prepare students for exams. Thus, the purpose of this research is to address the following questions.

1. What are the relationships between Turkish eighth-grade students' oral reading efficacy, reading comprehension, and standardized scores in mathematics, science, language arts, history, English, religion, and overall performance in TEOG?
2. To what extent do the Turkish eighth-grade students' oral reading efficacy and reading comprehension skills together explain the variance in mathematics, science, language arts, history, English and religion, and overall exam performance?

Method

Participants

The participants in the study were 95 eighth-grade students (62% female) who attended a public middle school located in Turkey's Ankara province. Informed consent letters were obtained from all of the participants and their parents. The participants were relatively homogenous and of middle socioeconomic status. They ranged from 14 to 15 years of age. None were identified as with learning disabilities and their reading development was determined to be within grade-level

expectations and typically developing by classroom teachers, the school principal, and the school counselor. The native language of all participants was Turkish and none were fluent speakers of English.

Measures

Reading comprehension, oral reading efficacy (speed and accuracy), and subject knowledge [high school placement exam (TEOG)] were assessed.

Reading Comprehension

The multiple-choice reading comprehension test, which was developed by Sever (2000), was administered to the students by their teachers once in a single class period. The students were asked to answer the questions based on the passages along with 20 multiple-choice items. The passages in the comprehension test varied type-wise (narrative and expository). The test was considered to measure literal and deep comprehension reading skills. Reading for literal meaning refers to identifying information conveyed in the text through paraphrasing or translating, and reading for deep meaning refers to obtaining the meaning of sentences by making connections between them and making connections between information in the text and reader' background knowledge. Cronbach's alpha reliability score of the test was found to be 0.89. The responses of the students were scored dichotomously (1 = correct, 0 = incorrect).

Oral Reading Efficacy

The current study uses Roehrig, Petscher, Nettles, Hudson, and Torgesen' (2008) theoretical framework for oral reading efficacy – measurements of the number of words correctly read from a text in a minute (automaticity – speed) and number of words read correctly (accuracy) as they noted these two are appropriate reading competencies for research on primary level

students. Students read a grade-level text in one minute and were measured on speed and accuracy (Rasinski & Padak, 2003) to measure their oral reading efficacy skills. The score for speed was calculated by summing all words read accurately. The alpha reliability coefficient was found to be 0.87. The score for accuracy was calculated by dividing the speed score by the total number of words that the student then multiplied by 100 to obtain a percentage of word read correctly score. The text was selected from an eighth-grade textbook approved by the Ministry of National Education that students were not familiar with. The 230-word text titled "Yunus Emre" has 21 sentences (638 syllables) and is about a famous Turkish poet and Sufi (1238–1320 AD) known for his impact on Anatolian culture.

TEOG Scores

The Turkish High School Placement Exam (TEOG) is administered twice a year by the Turkish Ministry of National Education to all eighth-grade students to place them in high schools. The subjects measured on the TEOG are language arts, mathematics, history, English, religion, and science. TEOG scores were electronically delivered to the researchers once consent was received by students, parents, and school administers. Every subtest has 20 questions; the entire test has a total of 120 questions.

Procedure

Research was conducted over a 2 week period during the regular school calendar. The research team interviewed teachers and school administrators to identify eligible participants. The reading comprehension assessment was administered in the first week of research and the oral reading efficacy assessment the second week. The statistical package SPSS was used to organize and analyze the data from the three assessments. Regarding the first research question, bivariate correlations were calculated, and, for the second research question, a multiple regression was run.

TABLE 1 Descriptive Statistics

Variables	*M*	*SD*	Min	Max	Skewness	Kurtosis	α
Predictors							
1. Speed (wcpm)	119.87	21.33	50.00	160.00	−1.12	1.67	0.86
2. Accuracy (%)	94.02	5.72	70.13	100.00	−2.50	3.13	–
3. Comprehension	71.63	16.39	20.00	100.00	−0.99	0.67	0.89
Outcomes (TEOG scores)							
4. Language arts	68.31	19.94	20.00	100.00	−0.48	−0.48	0.83
5. Mathematics	43.57	22.41	5.00	100.00	0.63	−0.58	0.83
6. Science	63.73	21.58	10.00	100.00	−0.11	−0.75	0.83
7. English	67.07	25.04	.00	100.00	−0.43	−0.46	0.87
8. History	73.31	22.97	5.00	100.00	−0.97	0.10	0.87
9. Religion	80.00	18.40	30.00	100.00	−1.13	0.47	0.86
10. TEOG Total	395.31	109.12	115.00	575.00	−0.18	−0.71	0.97

Note. TEOG = High School Placement Exam.

Findings

Table 1 shows descriptive statistics of the assessments including mean, standard deviations, range, skewness, and kurtosis values for the full sample. Normality assumptions were checked and were not violated. Subsequent analyses were conducted using raw scores.

Correlations between measures are displayed for the full sample in Table 2. Speed was moderately related to overall TEOG and subject matters measures ($0.28 \leq rs \leq 0.63$), accuracy was moderately related to overall TEOG and subject matters measures ($0.31 \leq rs \leq 0.60$), and comprehension was also moderately related to overall TEOG and subject matters measures ($0.42 \leq rs \leq 0.65$).

Multiple regression analyses were calculated to predict the achievement in overall TEOG and subject matters based on efficacy components and reading comprehension. The results are displayed for the full sample in Table 3. Significant regression equations were found for language arts, mathematics, science, English, history, religion, and overall score [(F (3,91)=39.928, $p<.001$); (F (3,91)=7.995, $p<.001$); (F (3,91)=18.104, $p<.001$); (F (3,91)=18.956, $p<.001$); (F (3,91)=37.606, $p<.001$); (F (3,91)=24.686, $p<.001$); (F (3,91)=40.034, $p<.001$), respectively]. The results reveal that speed showed statistical impact only on the history section ($\beta = 0.31$, $p<.05$). On the other hand, the students' accuracy scores manifested significant effect on language arts ($\beta = 0.41$, $p<.00$), science

TABLE 2 Correlations among Measures

	1	2	3	4	5	6	7	8	9
1. Speed	–								
2. Accuracy	0.80**	–							
3. Comprehension	0.39**	0.37**	–						
4. Language arts	0.52**	0.59**	0.65**	–					
5. Mathematics	0.28**	0.31**	0.42**	0.68**	–				
6. Science	0.44**	0.47**	0.53**	0.73**	0.78**	–			
7. English	0.37**	0.33**	0.62**	0.64**	0.60**	0.67**	–		
8. History	0.63**	0.60**	0.59**	0.78**	0.58**	0.68**	0.59**	–	
9. Religion	0.46**	0.55**	0.56**	0.72**	0.51**	0.53**	0.50**	0.58**	–
10. TEOG	0.54**	0.57**	0.66**	0.90**	0.83**	0.88**	0.81**	0.84**	0.74**

Note. TEOG = High School Placement Exam.
**$p<.01$.

TABLE 3 Multiple Regression Analyses in Relation to Overall TEOG and Subject Matters' Scores

Predicted	Predictors	*B*	*SE B*	β	R^2
Language arts	Speed	−0.01	0.11	−0.01	0.57
	Accuracy	1.44	0.40	0.41***	
	Comprehension	0.62	0.09	0.51***	
Mathematics	Speed	−0.01	0.17	−0.01	0.21
	Accuracy	0.76	0.61	0.19	
	Comprehension	0.49	0.14	0.36***	
Science	Speed	0.06	0.14	0.06	0.37
	Accuracy	1.05	0.52	0.28*	
	Comprehension	0.54	0.12	0.41***	
English	Speed	0.16	0.16	0.14	0.39
	Accuracy	0.17	0.60	0.04	
	Comprehension	0.81	0.14	0.53***	
History	Speed	0.33	0.13	0.31*	0.55
	Accuracy	0.84	0.47	0.21	
	Comprehension	0.56	0.11	0.40***	
Religion	Speed	−0.04	0.11	−0.05	0.45
	Accuracy	1.40	0.42	0.44***	
	Comprehension	0.47	0.10	0.42***	
Overall TEOG	Speed	0.46	0.59	0.09	0.57
	Accuracy	5.96	2.19	0.31**	
	Comprehension	3.42	0.50	0.51***	

Note. TEOG = High School Placement Exam.
*$p<.05$, **$p<.001$, ***$p<.001$.

($\beta = 0.28$, $p < .05$, religion, $\beta = 0.44$, $p < .001$), and overall TEOG scores ($\beta = 0.31$, $p < .001$). The multiple regression analysis showed no significant impact of accuracy on mathematics,

history and English scores. Results also indicated that students' reading comprehension skills appeared to hold a strong power of predicting their TEOG performance on all subjects (language arts: $\beta = 0.51$, $p < .001$, mathematics: $\beta = 0.36$, $p < .001$, science: $\beta = 0.41$, $p < .001$, English: $\beta = 0.53$, $p < .001$, history: $\beta = 0.40$, $p < .001$, religion: $\beta = 0.42$, $p < .001$, and total overall TEOG scores: $\beta = 0.51$, $p < .001$). Thus, the results confirmed that the most powerful variable to predict students' test performance was reading comprehension followed by accuracy.

In addition, Table 3 shows that reading efficacy components and reading comprehension are able to explain student performance of TEOG in different levels. In this regard, accuracy and comprehension appeared to explain 57% of the variation in students' language arts achievement, 45% of the variation in religion achievement, 37% of the variation in science achievement, and 57% of the variation in total TEOG performance. Speed and comprehension were able to predict 55% of the variation in history achievement. Reading comprehension alone explained 40% of the variation in English achievement and 21% the variation in of mathematics achievement.

Discussion

The purpose of this study was to understand the relation between Turkish eighth-grade students' oral reading efficacy (speed and accuracy), reading comprehension, and subject knowledge and overall scores from a high school placement exam. Data guiding the findings indicated that eighth-grade students' performance on the TEOG high-stakes test was significantly related and predicted by students' reading skills. Between the three measured predictors, speed, accuracy, and reading comprehension, reading comprehension was the only one found to significantly predict all subjects and overall exam performance. This aligns with previous research on the relation between reading comprehension and overall exam scores (Buck & Torgesen, 2003; Yilmaz, 2011) and specific subject knowledge (e.g. science, Obali, 2009; Yilmaz, 2011; mathematics, Akay, 2004; Björn et al., 2016; Cimmiyotti, 2013; Kivrak, 2014; Ozdemir & Sertsoz, 2006; Vilenius-Tuohimaa, et al., 2008; Yilmaz, 2011). To the best of the authors' knowledge,

this is the first study to measure the relation between reading efficacy, reading comprehension, and the subjects English (as a foreign language), history and religion. This study found that these subjects were also significantly predicted by reading comprehension. In addition, accuracy significantly predicted students' language arts, science, religion, and overall TEOG scores. Reading comprehension and accuracy explained 57% of the variation in the overall exam scores (similar findings to Ceren & Deniz, 2015). On the other hand, speed only significantly predicted student's History scores. These findings were surprising for unique relation was expected between English, due to its opaque alphabet (Patel, Snowling, & de Jong, 2004) in contrast to Turkish's transparent (Oney & Durgunoglu, 1997), and the other subjects. However, since speed and accuracy were measured in Turkish, and not in English, this could have contributed to these findings.

In all subjects, the general lack of relationship between reading efficacy (speed and accuracy), in predicting exam scores may be due to multiple factors, such as the reading development stage of the students and the transparency of the Turkish orthography. For example, relevant literature provides varying evidence regarding efficacy and academic performance relations and the impact of oral reading efficacy on students' test performances (Basaran, 2013; Hunley, Davies, & Miller, 2013; Nunez, 2009; Yilmaz, 2011), but this could be due to the fact that these studies measure students in different phases of reading development in languages with different levels of language opacity. According to Chall (1983), eighth-grade students at the end of the year would be expected to be between the third and fourth stage of reading development. This would suggest that all students, in general, have well-developed, automatic decoding skills and that, therefore, their abilities in reading efficacy and reading comprehension may be less related, and that general reading comprehension skills would be more important for their automaticity scores are no longer developing. This was supported by the weak-to-moderate correlations found between reading comprehension and speed ($r = 0.39$) and accuracy ($r = 0.37$) and the stronger overall correlations between reading comprehension and TEOG scores (range $r = 0.42$–0.66; average $r = 0.58$) compared to TEOG scores and

speed (range $r = 0.28 - 0.63$, average $r = 0.46$) and TEOG scores and accuracy (range $r = 0.31$–0.60, average $r = 0.49$). Moreover, the students in the present study were generally considered to be average to above average in terms of their reading development. Different result may have been found with students whose reading proficiency is considered to be below average.

The results of this study suggest that oral reading efficacy, especially accuracy, and reading comprehension are important skills that student performance in high-stakes achievement tests. Not only for language arts but for also science and mathematics. Student reading skills, including speed, accuracy, and comprehension, appeared to be effective factors defining students' success in these content areas. These results are also consistent with previous research findings (e.g. Rasinski et al., 2005, 2017; Uccelli & Phillips Galloway, 2017). For example, Rasinski et al. (2005) found that reading efficacy was a significant variable in secondary students' reading and overall academic development. Also, Bigozzi, Tarchi, Vagnoli, Valente, and Pinto (2017) revealed that while reading fluency and reading comprehension are interrelated processes, both make statistically significant contributions to the prediction of the students' school outcomes in several subjects (e.g. Italian, English, History, Geography, Mathematics, and Sciences), similar to the current findings. In a related study, Ratliff (2007), suggested that the Texas Assessment of Knowledge and Skills (TAKS) test questions measured students' reading comprehension and knowledge in a content area together. Both studies emphasized that STEM subject assessments constructed to include high amounts of reading may lead to it being challenging for assessors to distinguish subject knowledge from reading performance. Ratliff (2007) urged test developers to structure valid achievement tests that measure students' specific content knowledge purposefully, separate from their reading comprehension skills.

Conclusion

This study investigated the relationship between oral reading efficacy (speed and accuracy), reading comprehension, and

subject and overall scores for Turkish eighth-grade students on a high school placement exam and had several implications.

First, this test highlights the importance of reading instruction in not only language arts courses, but in STEM subjects as well. School administrators and teachers might consider initiating more efforts on increasing students' reading skills. Teachers should underscore the value of implementations that encourage students to think, read, and write (Hayes & Flowers, 1980) in all subject matters. Developing reading skills may allow students to increase likelihood of becoming autonomous consumers of information, which may also may promote genre-specific vocabulary development, a skill that will hopefully be considered in future studies exploring these relations. Teachers are urged to use methods that foster this mindset, such as the skill-based approach. Indeed, to help students to make sense of content and perform well on academic tasks, such as high-stakes tests, essential resources (e.g. textbooks, time, materials) along with ongoing training balanced with more individualized instruction is recommended (Connor, Morrison, & Petrella, 2004; Durkin, 1978; Pearson, 1985).

Second, the results of this study provided strong empirical evidence to what extent the students' reading skills predicted their academic performance in a nationwide high-stakes achievement test. The findings suggest that students who have challenges in reading skills development, especially comprehension, may have difficulties on exams such as the one assessed here. Considering these findings, it may be advisable for test makers to construct tests with questions that focus on content areas with limited language, especially for STEM subjects, so that results are not confounded by low reading skills. As discussed previously, Ratliff (2007) suggested that a test with insignificant reading skills involvement may provide more reliable results regarding students' achievement. Indeed, this may require test developers to be cognizant about such significant effects of reading skills on student performance and, thus, restructure test questions accordingly.

On the other hand, this could also lead to filtering students who are ill prepared to succeed at comprehending more complex, theoretical textbooks that are often introduced in

high school, even in STEM subjects, to high-achieving high schools. This begs to question students who may be gifted in subject knowledge but have not developed sufficient reading skills to score well on high school placement exams can best be served and funneled to the appropriate schools. It seems that this would be a school policy decision about how to appropriately weight exam scores along with other factors, such as grades and teacher recommendations. Therefore, not only new test development is recommended, but school level actions are also required to address the current situation represented by accumulation of relevant literature as well as the results of this study.

Future Research and Limitations

As previously mentioned, to the best of the authors' knowledge, this is the first study exploring the relation between oral reading efficacy, reading comprehension, and subject subtests, and overall achievement on a Turkish high school placement exam. This paper proposes that reading comprehension (and to a lesser extent oral reading efficiency) be considered influential variables for predicting subject and overall scores on a high-stakes test in Turkish. However, more research is needed on this relation for students of different reading achievement levels, other ages, different languages (transparent and opaque), and using different types of assessments, including ones that may be less structured in a format that requires reading for STEM subject, which to the best of the author's knowledge, currently no studies do, to explore how this relation may vary. In addition, if this study were to be replicated, it would be advisable to measure oral reading efficacy and reading comprehension in both English and Turkish to extend the understanding of how the relation may change for second language learners, especially those who may no longer be developing these skills in their home language but are shifting from a transparent orthography to a more opaque language such as English.

Also, as previously mentioned, since the students of this study are transitioning from Chall (1983) stage 3 to stage 4,

suggesting that they are in the process of developing more genre-specific vocabulary, future research that includes a vocabulary assessment as a predictor could would be beneficial. Although the current study's model explained a high level of the variation in the test scores (accuracy and reading comprehension accounted for 57% of the variation in the overall TEOG scores), adding vocabulary may make this a more complete model or suggest to what degree oral reading efficacy and reading comprehension are correlated with vocabulary.

A further limitation of the present study is that the reading comprehension was assessed from a brief assessment constructed off a language arts book. This could mean that the relation between reading comprehension and language arts is somewhat exogenous and the findings between these two may be biased since the highest correlation between a subject and reading comprehension was in language arts. However, taking this into account, it would be challenging to construct a reading comprehension assessment that does not lead to this issue. One consideration would be to construct a test that was based on fiction texts to help control its relation to the history subtest for the very least.

Finally, focusing on the effects of students' reading skills on high-stake test achievements hold promises to provide information to parents, teachers, students, test developers and school administrators in different ways. However, a limitation of this study was related to the context and the participant selection methods of this research. Considering the broad group of stakeholders interested in the results of research like this one, replications of this study with a larger sample size and a more socio-economically diverse population would ensure more reliable and generalizable results, hopefully yielding to more sophisticated discussions. To construct a more profound understanding about the effect of reading skills on academic achievement, researchers might consider extending to including cross sections of multiple grades, such as elementary and middle school students, identify not only how the reading skills of elementary school students may relate to subject achievement and overall achievement, but to determine how these relationships vary by development.

NOTE

1. The other three articles originally intended for the special issue of *Reading Psychology* on Reading Fluency are as follows:

Smith, G. S., & Paige, D. D. (2019). A study of reliability across multiple raters when using the NAEP and MDFS rubrics to measure oral reading fluency. *Reading Psychology*, *40*, 34–69. doi: 10.1080/02702711.2018.1555361

Young, C., & Ortleib, E. (2018). Implementing readers theater in secondary classrooms. *Reading Psychology*, *39*, 879–897. doi: 10.1080/02702711.2018.1555364

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