Examination of the Reading Comprehension Skills of Good and Poor Readers in the Dimension of Reading Components Developed by a Reading Skills Assessment Tool [*]

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Abstract

The aim of this study is to develop a Reading Skills Assessment Tool (RSAT) for 2nd, 4th, 6th and 8th grade readers and to assess if there is a significant difference between the decoding and fluent reading skills of good and poor comprehenders. First, validity and reliability studies of the RSAT, which includes the dimensions of decoding, fluent reading, and reading comprehension, were conducted in this direction. The RSAT was finalized with the data collected from 840 participants in validity and reliability studies. Following this, the reading comprehension scores of 150 participants at each grade level were divided into lower and upper 27% groups, and groups with good and poor comprehenders were determined. Then, the differences in the decoding and reading fluency results of the good and poor comprehenders were studied.

The results revealed that the decoding and fluency reading performances of good comprehenders were considerably superior to those of the group with poor comprehenders, and the results were reviewed in light of the relevant literature. Consequently, good comprehenders performed better than poor comprehenders in decoding (syllable reading pace, real word reading pace and pseudoword reading accuracy) and fluent reading (correct number of words read per minute).

With the research, a formal tool for evaluating reading skills has been added to the Turkish literature, and it has contributed to the elimination of an important limitation in this field. RSAT can be used effectively by experts in scientific studies and by teachers in the evaluation of student performance in practice. In addition, it was emphasized that good and poor readers perform differently in all aspects of reading, and that it is crucial to prevent future

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problems by conducting the necessary evaluations and interventions at the outset of reading instruction.

Introduction

Although reading is briefly defined as translating written symbols into verbal language, it is clearly emphasized in detailed definitions that the ultimate goal is to extract meaning from what is read. In line with these definitions, it is clear that translating written materials into verbal language alone does not meet an effective reading behavior. Güldenoğlu, Kargın, and Miller (2014) emphasized that for effective reading behavior, the reader must first translate the written material into verbal language by using phonological and morphological skills and then reach the message by reconciling vocabulary and syntactic knowledge with his previous knowledge.

In the Theory of Simple View of Reading, Gough and Tunmer (1986) stressed that readers should have two skills to have effective reading skills; namely decoding, and listening comprehension. It is stated that readers who perform effectively in both skills are more successful in the reading comprehension process, which is the final stage of reading (Gough, Hoover, & Peterson, 1996; Hoover & Gough, 1990). In addition, it is reported that both decoding and listening comprehension skills are important predictors for reading comprehension (Hoover & Gough, 1990; Gough et al., 1996; Singer & Crouse, 1981; Stanovich, Cunnigham, & Freeman, 1984) and that each is independent of the other and has different prediction levels at different academic stages (Catts, Hogan, & Adlof, 2005). Studies show that reading comprehension difficulties arise from difficulties in word decoding (Curtis, 1980; Cutting & Scarborough, 2012; Ehrlich, Kurtz-Costes, & Loridant, 1993; Florit & Cain, 2011; Kendeou, van den Broek, White, & Lynch, 2009; Perfetti & Hogaboam, 1975), fluent reading (Başaran, 2013; Fuchs, Fuchs, & Maxwell, 1988; Klauda & Guthrie, 2008) and language skills (McCardle, Scarborough, & Catts, 2001; Nation, 2005; Nation & Snowling, 1997; Share & Leikin, 2004; Storch & Whitehurst, 2002; Stothard & Hulme, 1995; Yuill & Oakhill, 1991). In line with these findings, for readers to use their existing language skills in their reading comprehension processes, they first need to translate written words into verbal language by exhibiting effective decoding and fluent reading behaviors.

Decoding skills are an important predictor of reading comprehension processes, although not sufficient on their own in the direct explanation of reading comprehension skills. Studies support this with the conclusion that good decoders are more successful in reading comprehension than poor decoders (Gentaz, Sprenger-Charolles, & Theurel, 2015; Megherbi, Seigneuric, & Ehrlich, 2006). Furthermore, it is suggested that decoding performances are explained by the readers' phonological knowledge and skills (Brady & Shankweiler, 1991; Goswami & Bryant, 2016; Snowling, 2000) which develop in the preschool age (Cabell, Justice, Konold, & McGinty, 2011; Ecalle, Biot-Chevrier, & Magnan , 2008; Kargın, Ergül, Büyüköztürk, & Güldenoğlu, 2015; Lyon, Shaywitz, & Shaywitz, 2003; Pullen & Justice, 2003; Trudeau & Sutton, 2011; Whitehurst & Lonigan, 1998). The reading behaviors of good and poor decoders are explained by the Phonological Reading Theory, which is based on phonological knowledge and skills (Frost, 1998). According to this, readers decode the words they encounter in sound or syllable unit using their existing phonological knowledge and skills and then complete the reading activity by reaching meaning of the words they read. It is emphasized that in order to achieve effective results in this process, readers should acquire effective phonological knowledge and skills in the preschool period (Muter, Hulme, Snowling, & Taylor, 1998; Wagner, Torgesen, Laughon, Simmons, & Rashotte, 1993). Otherwise, readers are likely to face difficulties both directly in decoding and fluent reading, as well as indirectly in reading comprehension processes. (Nation & Snowling, 2004).

Fluent reading skill is defined as the ability to read with an accurate (Katzir et al., 2006), rapid and appropriate prosody (Rasinski, 2004a) in a way that facilitates reading comprehension. Hudson, Torgesen, Lane, and Turner (2012) emphasize that fluent reading skills consist of *single word reading* and *decoding fluency* components. *Single word reading* component is the speed and accuracy of reading the real words that the reader encounters. Readers who are successful in single word reading processes employ orthographic reading processes efficiently, and as a result, they will do better in text reading processes in terms of both speed and accuracy. Decoding fluency is defined as the skills that the reader uses to decode the word analytically when words that cannot be read orthographically appear (Hudson, Pullen, Lane, & Torgesen, 2008). Furthermore, challenges with decoding fluency abilities have a direct detrimental impact on fluent reading skills, and readers with good decoding skills are more effective in fluent reading skills (Hudson et al., 2008). The influence of decoding fluency is observed significantly more in texts with a large number of words met for the first time, and readers with poor decoding fluency skills are bound to have difficulty with both fluent reading and reading comprehension (Hudson et al., 2008). In general, readers must read the words they meet accurately and at a suitable speed, and the correct number of words read by the readers per minute is used as the basis in research, particularly in the evaluation of reading fluency (Hasbrouck & Tindal, 1992; Hasbrouck & Tindal, 2006; Rasinski, 1990). Furthermore, it is stressed that fluent reading entails not only rapid and accurate decoding, but also generating suitable meanings of the words decoded (Allington, 2006; Fuchs, Fuchs, Hosp, & Jenkins, 2001). Perfetti (1985) emphasizes, particularly in the verbal efficiency theory, that the cognitive system has limitations in the processes of decoding words and reaching meaning at the same time, so the reader should be as automatic as possible in the decoding processes and devote their cognitive resources to comprehension processes. The Dual Route Cascaded Model of Reading explains how good and poor readers reach meaning after fluent reading processes (Coltheart, 2006). Dual Route Cascaded Model clarifies that the readers follow two different routes in the reading process: *lexical* and *non-lexical*. The lexical route is defined as the method by which readers read all of the words they encounter in one sitting, utilizing only their orthographic lexicon and no decoding. Readers who take the non-lexical route read words by decoding them using letter-sound or syllable unit size conversion. According to this model, when reading words for the first time, good readers choose the non-lexical route and read the word by decoding it in letter or syllable units, saving the word, orthographic and phonological lexicon, and semantic system. When the same word is encountered again, the orthographic lexicon is utilized to read the word rather than decoding it in letter or syllable units, and the meaning is determined using the semantic system. On the other hand, it is stated that poor decoders prefer the non-lexical route in all reading processes, but they perform lower in terms of both speed and accuracy than good decoders. In this respect, it is stated that readers with good orthographic reading skills read more fluently, and fluent readers transfer the cognitive resources to be allocated for decoding to the comprehension processes, resulting in greater success in reading comprehension. (Ehri et al., 2001; Kim, Wagner, & Lopez, 2012; Report of the National Reading Panel, 2000; Schiff, Schwartz, & Nagar, 2011; Share, 1995; Shaywitz & Shaywitz, 2005; Stanovich, 2000; Troia, 2004; Vellutino, Fletcher, Snowling, & Scanlon, 2004).

Decoding and fluent reading skills have varying effects on reading comprehension skills depending on certain periods, and they have different consequences at different academic levels. While decoding and fluent reading skills are more important predictors of reading comprehension in primary school, listening comprehension is a more essential predictor in secondary school, according to the research (Catts et al., 2005). On the other hand, it is asserted that decoding and fluent reading abilities are critical components of reading comprehension at both the elementary and secondary school levels (Paap & Noel, 1991; Paige & Magpuri-Lavell, 2014; Tilstra, McMaster, Van de Broek, Kendeou, & Rapp, 2009). Bigozzi, Tarchi, Vagnoli, Valente, and Pinto (2017) state that fluent reading is the most important predictor of success in literacy-based courses in both primary and secondary schools. On the other hand, it is stressed that some readers have considerable reading comprehension difficulties despite possessing

decoding and fluent reading skills appropriate for the grade level (Nation & Snowling, 1997; Oakhill, 1994; Stothard & Hulme, 1995; Yuill & Oakhill, 1991). Given the fact that the components of reading have varying impacts at various academic levels, it is vital to regularly assess the readers' performances, particularly the components of reading. From this vantage point, the significance of standard evaluation tools becomes apparent in order to obtain more accurate results regarding the readers' performance, as evidenced by their use in numerous studies.

When the content of the most frequently used standard assessment tools used in the literature to assess readers' reading abilities and determine whether they are good or poor readers is examined, it is clear that the dimensions of decoding, fluent reading, and reading comprehension are included (*Gray Diagnostic Reading Test Second Edition* (GDRT-2), Bryant, Wiederholt, & Bryant, 2004; *Kaufman Test of Educational Achievement, Third Edition* (KTEA-II), Kaufman, 2014; *Wechsler Individual Achievement Test – Third Edition* (WIAT-III), Wechsler, 2009; *Woodcock-Johnson III Tests of Achievement* (WJ III ACH), Woodcock, McGrew, & Mather, 2007; *Woodcock Reading Mastery Test, Third Edition* (WRMT-3), Woodcock, 2011). By examining the general characteristics of widely used standard assessment tools, it is clear that they not only evaluate readers' reading performance, but also shed light on intervention programs. Additionally, these tools are used to determine the participant group in scientific research, to compare group performances, and to evaluate the relationships between various components of reading (Frisk, Amsel, & Whyte, 2002; Price, Meisinger, Louwerse, & D'Mello, 2016; Tilstra et al., 2009; Wei, Blackorby, & Schiller, 2011). In Turkey, it is clear that standard assessment tools for evaluating readers' reading performance at specific grade levels are severely limited (*Erken Okuryazarlık Testi* (EROT), Kargın et al., 2015; *Sesli Okuma Becerileri ve Anlama Testi* (SOBAT-II), Melekoğlu, Erden, & Çakıroğlu, 2019), and assessments are frequently conducted using non-standard assessment tools developed by experts. Given that the degree to which the results obtained from the non-standard assessment tool reflect actual performance is limited by the competencies of the expert who developed the tool, generalization, and interpretation of the results obtained will be limited. From this vantage point, it is an indisputable fact that standard assessment tools for evaluating the reading abilities of Turkish readers must be developed.

In the view of all this information, it is clear that the decoding and fluent reading components of reading are important components for reading comprehension skills. The findings from this study are expected to make significant contributions to the literature. To begin, it is clear that studies on the decoding and fluent reading abilities of good and poor readers were conducted in transparent and opaque orthographies. Languages' orthographic features have a significant impact on decoding abilities, and decoding abilities are more easily acquired in languages with transparent orthographies, such as Turkish (Durgunoğlu ve Öney, 1999; Durgunoğlu ve Öney, 2002; Raman, 2006). While studies conducted in Turkish emphasize the importance of decoding (Çelik & Karasakaloğlu, 2021; Güldenoğlu, Kargın, & Ergül, 2016; Güldenoğlu, Kargın, & Miller, 2012) and fluent reading (Başaran, 2013; Baştuğ & Akyol, 2012) skills for reading comprehension, it is evident that studies conducted in opaque orthographies are used to discuss the findings. This is due to the lack of studies in Turkey evaluating the decoding and fluent reading skills of students with good and poor reading comprehension skills at different grade levels. With this study, decoding and fluent reading skills will be examined at different grade levels, and functional information about their importance in reading comprehension processes will be reached. Finally, a tool will be developed to assess readers' reading abilities in the dimensions of decoding, fluent reading, and reading comprehension.

This study has two primary objectives. The first objective is to develop the Reading Skills Assessment Tool (RSAT), which will be used to assess the reading abilities of 2nd, 4th, 6th, and 8th grade readers. The second objective is to determine whether the RSAT distinguishes readers with good and poor reading comprehension abilities, as determined by their RSAT reading comprehension performance, in other components of reading and accordingly, it is to contribute to the literature by comparing the reading performances of the reader groups in the components of reading according to their grade levels. Four research questions prepared for this purpose are given below:

1. Does RSAT meet the validity and reliability requirements?

2. Is there a significant difference in decoding and fluent reading performances of 2nd grade good and poor comprehenders?

3. Is there a significant difference in decoding and fluent reading performances of 4th grade good and poor comprehenders?

4. Is there a significant difference in fluent reading performances of 6th and 8th grade good and poor comprehenders?

Method

The purpose of this study was to develop the RSAT, which will be used to assess the reading abilities of readers in the 2nd, 4th, 6th, and 8th grades, as well as the decoding and fluent reading abilities of good and poor comprehenders. The research was conducted in a descriptive type (Karasar, 2015). While deciding on the grade levels to include in the research, it was decided to include 2nd graders because readers should have completed the letter-sound conversion processes and gained reading experience, 4th graders because it is the final year of primary school, 6th graders because the differences in reading performance between 4th-5th grades will be less pronounced, and 8th graders because it is the final year of secondary school.

Participants

The research group consists of normally developing participants attending the 2nd, 4th, 6th and 8th grades in the three central districts of Ankara (Çankaya, Mamak, and Yenimahalle). Participants were determined by stratified sampling and schools (clusters) were used as sampling units. The study included 15 primary and 15 secondary schools, and data were collected from 14 (7 females and 7 males) participants from each grade level within each school. For the validity and reliability studies of the RSAT's syllable reading, word reading, fluent reading, and reading comprehension dimensions, data were collected from 210 participants at each grade level and a total of 840 participants. Validity and reliability studies for the syllable reading, word reading, and fluent reading dimensions were conducted using data from 150 (75 females and 75 males) students across all grade levels and 600 total participants in the 840 participant group. The reading comprehension dimension's validity and reliability studies were conducted using data from a total of 840 participants, 210 (105 girls and 105 boys) from each grade level. In the second stage of the study, data from 150 participants from each grade level in the group where the data were collected were divided into lower and upper 27% groups in order to identify readers with good and poor comprehenders. The upper 27% group represents the group with good comprehenders (40) while the lower 27% group represents the group with poor comprehenders (40). The group characteristics according to the grade levels after the lower and upper 27% group separation are given in Table 1.

Table 1. Distribution of Participants with Good and Poor Reading Comprehension by Grade Levels

| Grade Level | Good Readers | | Poor Readers | | Total |
| | Sex | | Sex | | |
	Female	Male	Female	Male	
2nd	22	18	18	22	80
4th	19	21	20	20	80
6th	23	17	20	20	80
8th	14	26	23	17	80
Total	78	82	81	79	320

Data Collection Tool

Reading Skills Assessment Tool (RSAT): For 2nd graders, the RSAT includes four dimensions: syllable reading, word reading (real word and pseudoword), fluent reading, and reading comprehension. For 4th graders, the RSAT includes three dimensions: word reading (real word and pseudoword), fluent reading, and reading comprehension. Furthermore, it includes two components for 6th and 8th grade students: fluent reading and reading comprehension. Syllable reading dimension for second graders contains 96 syllables with six different syllable structures *(vowel(v), v+consonant(c), cv, cvc, vcc, cvcc)* that correspond to the Turkish language structure (Banguoğlu, 1986). The dimension of word reading is subdivided into two subdimensions: real word and pseudoword reading. Within the sub-dimension of word reading, 42 words with at least one and a maximum of four syllables are prepared using a variety of different sound and syllable sequences. By drawing lots in front of three instructors, words were selected from a word pool created according to syllable structures. While the pseudoword sub-dimension contained 42 words, pseudowords were created by repositioning the letters that comprise real words (preserving the syllable structure). The words in the word reading dimension are used in common in the 2nd and 4th grades. The syllable and word reading dimensions are presented on the computer via the DmDX package program. The program tracks the participants' reading times for each syllable and word. In addition, the correct or incorrect responses are also recorded in the data collection tool by the practitioner. In the fluent reading dimension, there are four different texts for each grade level, consisting of two narrative and two informatory texts. Narrative and informatory texts are the types of texts that readers encounter frequently in their daily and academic lives (Weaver & Kintsch, 1991), and they are frequently used to assess readers' fluency and comprehension (Kraal, Koornneef, Saab, & van den Broek, 2018; Primor, Pierce, & Katzir, 2011; Wu, Barquero, Pickren, Barber, & Cutting, 2020). While participants are reading each text, the practitioner records their voices. The audio recordings are then listened to, and the average number of correct words read per minute by the readers is calculated as fluent reading performance. The number of correct words read was obtained by subtracting the words read incorrectly (misreading words, skipping words, adding letters or syllables, etc.) from the total number of words read. In reading comprehension dimension, there are reading comprehension questions about the texts used in the fluent reading process. To ensure objectivity in the evaluations, a total of 24 multiple-choice comprehension questions were created for four texts in the 2nd and 4th grades, and 28 for four texts in the 6th and 8th grades. There are five different types of multiple-choice questions: literal, reorganization, inference, prediction and evaluation (Day & Park, 2005).

Analysis

In the process of data analysis, first of all, the validity and reliability studies of the RSAT were carried out. Content validity was applied in the validity studies of the syllable reading, word reading and fluent reading dimensions in the RSAT. The reliability of the syllable reading and word reading dimensions was calculated with the KR-20 Internal Consistency Coefficient, while the Cronbach Alpha Coefficient was used in the reliability calculation of the fluent reading dimension. In the validity studies of the reading comprehension dimension, content validity, item difficulty index, item distinctiveness index and construct validity studies were implemented. In the process of examining the performances

of good and poor comprehenders in terms of components of reading, the T-Test was used for data with normal distribution, while the Mann-Whitney-U test was used for data that did not show normal distribution.

Results

Does RSAT Encounters the Reliability and Validity Requirements?

The validity and reliability studies were first started with the studies on the syllable reading dimension, which is only at the 2nd grade level. Six different types of 96 syllables were formed in accordance with the Turkish language structure (Banguoğlu, 1986) and the formed syllables were presented to the expert opinion of 10 primary school teachers working in the field and the instructors working in the Turkish Teaching Department. It was determined that the syllable reading dimension met the content validity conditions based on the obtained results. Following that, the KR-20 Internal Consistency Coefficient for the syllable reading dimension was calculated using data from 150 participants. The internal consistency coefficient for 96 syllables was found to be .87. When the obtained results are analyzed, it is clear that the syllable reading dimension satisfies the validity and reliability criteria (Kılıç, 2016).

The word reading dimension consists of two sub-dimensions: real word and pseudoword reading. There are 42 words in each sub-dimension. The words in the word reading dimension are used in common in both 2nd and 4th grades. Accordingly, the validity and reliability studies of the word reading dimension were performed separately for each grade level. In accordance with the content validity studies, 10 primary school teachers and three instructors from the Turkish Language Teaching Department were asked whether the words are suitable for the 2nd and 4th-grade levels, and it was concluded that the words had content validity at both grade levels. Following the validity studies, the reliability studies used the KR-20 Internal Consistency Coefficient to calculate the data of 150 participants in the 2nd grade and 150 in the 4th grade. Internal consistency coefficients for real word reading sub-dimension, pseudoword reading sub-dimension, and word reading dimension were found to be .72, .78, and .79 for 2nd graders, respectively. When the data from 4th graders were analyzed, the internal consistency coefficient for real word reading sub-dimension was .53, for pseudoword reading sub-dimension was .82, and for word reading dimension was .82. The low-reliability coefficient of the real word reading sub-dimension is thought to be due to the homogeneous distribution of the data (min=39, max=42, and mean= 41.91). The 4th grade participants' high reading performance in real word reading sub-dimension is expected given their increased reading experience. According to the findings, the word reading dimension was found to be valid and reliable at the 2nd and 4th grade levels (Kılıç, 2016).

For the purpose of determining the content validity of the fluent reading dimension, a total of four texts, two narrative and two informative, were prepared separately for each grade level and distributed to 10 primary school teachers, 10 secondary school Turkish teachers, and three instructors in the Turkish Teaching Department. Experts were tasked with grading the texts on their appropriateness for grade level, grammar, and expressiveness. Regarding expert evaluations, it was determined that the prepared texts met the criteria for content validity. Following the validity studies, the Cronbach Alpha Internal Consistency Coefficient was used to assess the fluent reading dimension's reliability. The analyses were conducted using the average number of correct words read per minute by participants from the four texts, and the alpha value for the 2nd grade was .95, the 4th grade was .97, the 6th grade was .76, and the 8th grade was .97. According to the findings of the studies, the RSAT's fluent reading dimension is valid and reliable across all grade levels (Kılıç, 2016).

The validity studies of the reading comprehension dimension of the RSAT were concluded with content validity, item difficulty index, and index of distinctiveness analysis, and finally construct validity studies, respectively. The reading comprehension dimension was developed using multiple choice questions based on the texts used in the fluent reading dimension; six questions were created for each primary school text and seven questions for each secondary school text. As a result, a total of 24

questions from four texts were developed for primary schools and a total of 28 questions for secondary schools. Expert opinion was obtained from ten classroom teachers regarding the suitability of primary school questions, ten Turkish teachers regarding the suitability of secondary school texts, and three instructors working in the Turkish Teaching Department regarding the suitability of all questions. According to the expert results, it was determined that the reading comprehension questions meet the content validity criteria. Following the content validity analysis, the reading comprehension questions' item difficulty index and index of distinctiveness were calculated. The item difficulty indexes (Table 2) are within the acceptable range, and index of distinctiveness (Table 3) are within the acceptable range of .21-.82. Although it was stated that items with a distinctiveness of less than .30 should be rearranged, when Table 3 is examined, the items with a distinctiveness of less than .30 are the comprehension questions in literal type. Given that the answers to the literal type questions are provided directly in the text, participants have the opportunity to view the text while answering the questions, and the participant group consists of students with typical development, it is expected that the probability of correctly answering such questions will increase. Given the importance of literal questions in the reading comprehension process, the researchers determined that they should be retained in the tool. Following the item analysis, construct validity studies of the reading comprehension dimension were conducted. Because the question items in the construct validity studies were coded as 1-0, Categorical Principal Component Analysis (CATPCA), one of the principal Component Analysis approaches, was applied. Questions from each text at grade levels were examined in the CATPCA procedure, and questions with item load values of less than .30 were excluded from the analysis. The procedure was repeated with the remaining question items, and each text's object scores were calculated. Then, Exploratory Factor Analysis (EFA) study was conducted in order to see whether the prepared texts form a one-dimensional meaningful structure with the object scores obtained from the texts. The results of EFA are given in Table 4.

Table 2. Item Difficulty Indexes of Reading Comprehension Questions

Texts		Item Difficulty Indexes							Average Difficulties of Texts
		1	2	3	4	5	6	7	
2nd grade	Bobo'nun Yardımı	.86	.81	.46	.72	.70	.59		.69
	Çalışkan Arılar	.76	.68	.61	.64	.54	.66		.65
	Ben Kimim?	.76	.77	.72	.53	.46	.62		.64
	Telefon	.77	.68	.56	.48	.50	.64		.61
4th grade	Aras ve Badem	.86	.85	.64	.64	.72	.78		.75
	Tatlı Pofular	.83	.84	.31	.72	.61	.51		.64
	Şempanzeler	.80	.57	.61	.40	.79	.73		.65
	Meyveler ve Sebzeler	.68	.50	.51	.55	.38	.44		.51
6th grade	Ben Merlin	.88	.85	.71	.55	.48	.69	.63	.68
	Tarihe Dokun	.83	.68	.50	.67	.51	.45	.26	.56
	Doping	.81	.44	.49	.43	.43	.54	.58	.53
	Saatler	.70	.58	.51	.59	.35	.65	.57	.56
8th grade	Tutkal	.89	.88	.54	.34	.38	.30	.68	.57
	Stadyum Günleri	.84	.70	.25	.69	.35	.17	.54	.51
	Astronotlar	.82	.49	.57	.63	.53	.53	.40	.57
	Yolcu Uçakları	.72	.62	.61	.24	.54	.48	.41	.52

Table 3. Index of Distinctiveness for Comprehension Questions

Texts		Index of Distinctiveness						
		1	**2**	**3**	**4**	**5**	**6**	**7**
2ⁿᵈ grade	Bobo'nun Yardımı	.28	.39	.63	.53	.53	.68	
	Çalışkan Arılar	.47	.47	.49	.61	.47	.58	
	Ben Kimim?	.47	.42	.49	.63	.53	.68	
	Telefon	.46	.56	.63	.51	.54	.65	
4ᵗʰ grade	Aras ve Badem	.28	.30	.72	.72	.56	.44	
	Tatlı Pofular	.30	.32	.37	.56	.68	.77	
	Şempanzeler	.35	.74	.74	.62	.40	.54	
	Meyveler ve Sebzeler	.65	.40	.63	.68	.44	.46	
6ᵗʰ grade	Ben Merlin	.23	.30	.37	.72	.65	.54	.60
	Tarihe Dokun	.35	.46	.61	.60	.81	.65	.35
	Doping	.32	.63	.74	.40	.68	.68	.74
	Saatler	.60	.55	.77	.72	.46	.60	.82
8ᵗʰ grade	Tutkal	.23	.25	.60	.58	.51	.46	.56
	Stadyum Günleri	.21	.42	.39	.58	.53	.31	.75
	Astronotlar	.33	.74	.65	.74	.60	.74	.54
	Yolcu Uçakları	.56	.51	.70	.30	.63	.54	.58

Table 4. Exploratory Factor Analysis of Object Scores Obtained from Reading Comprehension Texts

Grades and Texts	*Loadings*	*KMO*	*Bartlett'in KT*	*% of Variance*
2nd				
Ben Kimim?	.81	.77	213.02	59.70
Bobo'nun Yardımı	.80		*p*= .00	
Çalışkan Arılar	.71			
Telefon	.77			
4th				
Aras ve Badem	.81	.71	263.67	61.29
Şempanzeler	.82		*p*= .00	
Tatlı Pofular	.82			
Meyveler ve Sebzeler	.67			
6th				
Saatler	.88	.78	292.36	64.70
Ben Merlin	.73		*p*= .00	
Doping	.79			
Tarihe Dokun	.82			
8th				
Astronotlar	.83	.74	210.08	58.48
Yolcu Uçakları	.80		*p*= .00	
Tutkal	.68			
Stadyum Günleri	.74			

The findings of the object scores acquired in the texts at all grade levels come together in a meaningful way and describe a single structure when examining Table 4. While the variances explained range from 58.48 to 64.70, and the loading values of all texts are above .30. After the CATPCA and EFA, the model data fit was evaluated for each grade level to validate the derived structure (Thompson, 2004). In order to verify the acquired structure, the model data fit was tested with Confirmatory Factor Analysis (CFA). Table 5 shows the model data fit results.

Table 5. Goodness of Model Data Fit Values of Reading Comprehension Dimension

Index of Goodness of Model Data	2nd	4th	6th	8th
Normal theory weighted least squares chi-square (x^2)	2.35 (sd=2)	2.01 (sd=1)	1.07 (sd=2)	1.37 (sd=1)
Root Mean Square Error of Approximation (RMSEA)	0.03	0.07	0.00	0.04
Root Mean Square Residual (RMR)	0.02	0.02	0.01	0.03
Comparative Fit Index(CFI)	0.99	0.99	.98	0.99
Relative Fit Index (RFI)	0.97	0.96	0.99	0.95
Goodness of Fit Index (GFI)	0.99	1.00	1.00	0.99

*2nd, 4th, 6th and 8th= grades

In model data fit, a x^2/sd ratio below 2 indicates perfect model data fit, and a value between 2 and 5 indicates acceptable fit. In addition, RMSEA and RMR values below .05 indicate excellent model-data fit, and acceptable fit up to .08 (Hooper, Coughlin, & Mullen, 2008). Table 5 shows that the x^2/sd and RMSEA values of the 4th grade are at acceptable levels, and apart from these excellent model-data fit is achieved at all grade levels. The remaining indices above .90 indicate that the appropriate model-data fit is achieved for the reading comprehension dimension.

There is a positive relation between the reading comprehension dimension of the grade levels and the sub-dimensions (texts) at the grade levels when the information about the standard path coefficients for the grade levels as a result of CFA is analyzed. Error terms are below .90 at all grade levels. The best predictors of the 2nd grade reading comprehension dimension are Ben Kimim? (.75) and Bobo'nun Yardımı (.72) texts. These are followed by Telefon (.67) and Çalışkan Arı (.58) texts, respectively. Accordingly, a one-unit change in the total scores leads to a change of .75, .72, .67 and .58 in the reading comprehension dimension, respectively. The best predictors of reading comprehension dimension at the 4th grade level are Tatlı Pofular, Aras ve Badem, Şempanzeler and Meyveler ve Sebzeler, respectively. As a result, a one-unit change in the total scores of these sub-dimensions will lead to a change of .84, .79, .67 and .42 units in the reading comprehension dimension, respectively. While Saatler, Tarihe Dokun, Doping, and Ben Merlin texts are the best predictors, respectively, in 6th graders, a one-unit change in total scores will lead to a change of .88, .74, .69 and .60 in the reading comprehension dimension, respectively. The best predictors of 8th grade reading comprehension are Astronotlar, Stadyum Günleri, Yolcu Uçakları and Tutkal texts, respectively. Accordingly, a unit change in the total scores of the sub-dimensions will lead to a change of .71, .67, .63, 56 in the reading comprehension dimension, respectively. The validity criteria were met with 19 items in the 2nd grade and 22 items in the 4th grade as a result of the validity analyses, despite the fact that the analysis began with 24 question items for each grade. Validity conditions were encountered with 24 items in the 6th and 8th grades, which started with 28 items.

Test-Retest Reliability

The reliability study of the reading comprehension dimension, which consists of texts and questions connected to the texts produced to assess the participants' reading comprehension skills, used the test-retest technique. During the Test-Retest process, 30 participants from each grade level were reached for the first test, and a retest study was conducted 10 days later with the same groups. The Spearman-Brown Correlation Coefficient was used to investigate the relation between the test and retest outcomes and the results are given in Table 6.

Table 6. Test-Retest Reliability Results

Grades	Spearman Brown Correlation
2	.80
4	.70
6	.76
8	.75

When Table 6 is analyzed, it is concluded that the reading comprehension dimension is reliable at all grade levels, and that RSAT is a tool that can be used to evaluate the reading skills of students in the 2nd, 4th, 6th, and 8th grades.

Identifying Good and Poor Comprehenders

Readers with good and poor reading comprehension skills were identified following RSAT validity and reliability investigations. The overall scores achieved by participants at each grade level on the RSAT's reading comprehension dimension served as the basis for this method. Following the collection of data from 150 students in each grade level, a distinction was formed between the upper and lower 27% groups, with the upper 27% group being designated as the good group and the lower 27% group as the poor group. Thus, participants with 40 good and 40 poor comprehenders were determined. Following that, the T-Test for Unrelated Samples was used to determine whether there was a significant difference in reading comprehension scores between the good and poor groups. The results are shown in Table 7.

Table 7. Differences in Performance of Good and Poor Comprehenders at All Grade Levels

Grades	Group	n	Mean	SS	Min.	Max.	sd	t	p
2nd	1	40	17.30	.76	16	19	78	17.98	.00
	2	40	11.50	1.90	5	13			
4th	1	40	19.68	.97	18	22	78	17.16	.00
	2	40	12.48	2.47	6	15			
6th	1	40	21.63	.93	20	24	78	23.69	.00
	2	40	11.90	2.43	5	15			
8th	1	40	19.95	1.24	18	23	78	21.98	.00
	2	40	12.25	1.84	7	15			

1= good comprehenders, 2=poor comprehenders

According to Table 7, reading comprehension scores of good and poor comprehenders are significantly different. In light of these findings, the procedure of eliciting responses to the research questions was initiated.

Is there a significant difference in decoding and fluent reading performances of 2nd grade good and poor comprehenders?

The decoding and fluent reading abilities of 2nd grade good and poor comprehenders were compared in terms of syllable reading accuracy and pace in the syllable reading dimension, real word and pseudoword reading accuracy and pace in the word reading dimension, and the number of words correctly read in a minute in the reading fluency dimension of RSAT. The T-Test for Unrelated Samples or the Mann Whitney-U Test for Unrelated Measurements were employed to conduct the analyses, depending on whether the data displayed a normal distribution or not, and the results are summarized in Table 8.

Table 8. Performance Comparisons of 2nd Grade Good and Poor Comprehenders on RSAT's Sub-Dimensions

Dimensions	Group	n	Mean	SS	sd	t	p	U	p
						T-Test		**Mann Whitney-U**	
Accuracy	1	40	93.88	3.15				640.5	.12
(syllable)	2	40	92.18	6.58					
Pace	1	40	117.26	23.11	78	2.60	.01**		
(syllable)	2	40	131.56	22.65					
Accuracy	1	40	41.58	1.39				796.5	.96
(real word)	2	40	41.60	1.41					
Pace	1	40	50.38	13.37				586	.04*
(real word)	2	40	56.41	16.64					
Accuracy	1	40	38.43	2.47				560	.02*
(pseudoword)	2	40	35.90	5.35					
Pace	1	40	88.75	16.50	78	.93	.35		
(pseudoword)	2	40	91.82	12.98					
Fluent Reading	1	40	77.50	19.30	78	2.17	.03*		
	2	40	68.43	17.97					

1= good comprehenders, 2=poor comprehenders, **p≤ .01, *p≤ .05

As seen in Table 8, good comprehenders outperform poor comprehenders in terms of syllable and word reading pace. On the other hand, there was no significant difference in syllable and word reading accuracy between the two groups. This demonstrates that good comprehenders are more successful in decoding speed. Additionally, while there is no significant difference in pseudoword reading pace, good comprehenders perform much better in pseudoword reading accuracy. This finding demonstrates that good comprehenders are more successful at decoding than poor comprehenders. Finally, in fluent reading, good comprehenders also achieved more effective outcomes. With these results, good comprehenders have better performance not only in decoding accuracy but also in decoding pace and according to this they read more fluently.

Is there a significant difference in decoding and fluent reading performances of 4th grade good and poor comprehenders?

The decoding and fluent reading abilities of good and poor 4th grade comprehenders were compared using the RSAT's mean scores for the word reading and fluent reading dimensions. T-test or Mann Whitney-U test was used considering the normality characteristics of the data. Results are given in Table 9.

Table 9. Performance Comparisons of 4th Grade Good and Poor Comprehenders on RSAT Sub-Dimensions

						T-Testi		Mann Whitney-U	
Dimensions	Group	n	Mean	SS	sd	t	p	U	p
Accuracy	1	40	41.93	.35				780.5	.66
(word)	2	40	41.90	.38					
Pace	1	40	43.55	8.41	78	2.85	**.00***		
(word)	2	40	49	8.70					
Accuracy	1	40	39.77	2.60				444	**.00****
(pseudoword)	2	40	36.30	5.20					
Pace	1	40	74.96	10.74				713	.40
(pseudoword)	2	40	80.78	31.92					
Fluent Reading)	1	40	93.31	13.67	78	2.40	**.02***		
	2	40	82.15	26					

1= good comprehenders, 2=poor comprehenders, **p≤ .01, *p≤ .05

According to Table 9, the results obtained by the 4th grade good and poor comprehenders are consistent with those obtained by the 2nd grade good and poor comprehenders. While there was no difference in real word reading accuracy between the good and poor groups in 4th grade, there was a substantial difference in real word reading paces, with the good group being more effective. While there was no significant difference in reading pace for the pseudoword reading sub-dimension, it was noted that good comprehenders were much more successful at reading the pseudowords accurately. The reflection of this condition in decoding skills also has an effect on fluency performance, since it is noticed that good comprehenders perform better in the fluent reading dimension than poor comprehenders.

Is there a significant difference in fluent reading performances of 6th and 8th grade good and poor comprehenders?

The RSAT for grades 6 and 8 has only two dimensions: fluent reading and reading comprehension. Since the participants were classified as good and poor comprehenders in line with the scores they obtained in the reading comprehension dimension, the comparison was made only on the fluent reading performances. T-test was used to analyze the data, and results are shown in Table 10

Table 10. T-Test Results of 6th and 8th Grade Good and Poor Comprehenders for Reading Fluency Scores

Grade	Group	n	Mean	SS	sd	t	p
6th	1	40	112..51	11.92	78	3.31	**.00****
	2	40	102.19	15.70			
8th	1	40	125.23	16.06	78	.1.97	**.05***
	2	40	118.18	15.93			

1=good comprehenders, 2=poor comprehenders, **p≤ .01, *p≤ .05

According Table 10, good comprehenders at both grade levels are more successful in fluent reading than the poor comprehenders. Good comprehenders were found to read 10 words per minute more accurately in 6th grades and seven words per minute in 8th grades.

Discussion and Conclusion

Conducting required educational interventions by evaluating the existing reading skills of readers at various grade levels who exhibit varying developmental features in reading will play a critical role in preventing reading issues from producing future learning problems. As a result, readers should first be evaluated educationally in terms of the many components of reading. However, formal assessment tools are required to verify that the results received during the teacher's evaluation, who is responsible for making specific decisions (placement, determining reader performance, preparing an intervention program) for the reader based on the evaluation results, are credible. RSAT, as a valid and reliable tool established during the study process and in accordance with the findings, is believed to contribute to the process of accomplishing this goal. Teachers and other field experts will have the opportunity to assess the decoding abilities of 2nd and 4th grade readers on the syllable (2nd) and word reading dimensions; however, they will be able to identify which types of syllables or words the reader has difficulties with and will be able to tailor the intervention program accordingly. In addition, by evaluating the fluent reading performance of 2nd, 4th, 6th, and 8th grade readers, both group and individual comparisons can be made. Moreover, by identifying patterns in the types of errors made by readers during fluent reading processes, the opportunity to intervene in the skill causing the issue will occur. In the reading comprehension dimension, appropriate interventions will be initiated by obtaining data on readers' comprehension performance across a variety of text types. Additionally, by understanding which type of questions readers have difficulty with in their reading comprehension processes, it will be feasible to build intervention programs tailored to those question types. Although RSAT is not a diagnostic tool in terms of its content, it can be used effectively in the processes of determining the educational performance and special education support services carried out in Guidance Research Centers. Additionally, it is believed to be an excellent instrument for scientific investigations involving the processes of selecting the reader group, comparing the groups, and determining the skills believed to be associated with reading directly or indirectly.

To begin, the study evaluated the decoding skills of 2nd grade good and poor comprehenders, concluding that the good group was more successful in syllable and real word reading pace. This result can be directly explained by the Dual Route Cascaded model of reading (Coltheart, 2006). Accordingly, good comprehenders complete the process in a shorter time by choosing the lexical route in syllable and real word reading. Poor comprehenders, on the other hand, complete the process in a longer period of time because of trying to read the syllables and real words by decoding (preferring the non-lexical route). Other researches corroborate the conclusion that good readers excel at word decoding (Fleisher, Jenkins, & Pany, 1979; Gentaz et al., 2015; Perfetti & Hogaboam, 1975). Another finding in the study is good comprehenders are more successful in pseudoword reading accuracy than poor comprehenders. This can also be explained by Dual Route Cascaded model of reading. According to theory, when readers come across a word that is not in their lexicon, they read by choosing the non-lexical route. While there is no substantial difference in pseudoword reading speed, the fact that good comprehenders are more successful at reading accuracy indicates that both good and poor comprehenders take the non-lexical route when confronted with pseudowords, but good comprehenders decode more successfully. Results of the pseudoword reading performances are in parallel with the studies (Mouzaki & Sideridis, 2007; Güldenoğlu et al., 2012; Rakhlin, Mourgues, Cardoso-Martins, Kornev, & Grigerenko, 2019; Tal & Siegel, 1996) that include the finding that good readers have better pseudoword reading accuracy than poor readers. According to the research findings, it is obvious that poor comprehenders in second grade have difficulties with decoding processes, and it is speculated that this difficulty may come from the readers' limited phonological abilities. (Hoien-Tengesdal & Tonnesen, 2011; Stothard & Hulme, 1995). In order to eliminate these difficulties or to reduce their effects, sufficient emphasis and assistance should be placed on the readers' phonological decoding abilities during the early stages of reading.

At the 2nd grade level, it was observed that the good group read more correct words per minute than the poor group in the fluent reading dimension. This conclusion appears to be supported by studies examining the fluency (Ergül, 2012; Jenkins, Fuchs, van den Broek, Espin, & Deno, 2003; Kochnower,

Richardson, & DiBenedetto, 1983; Tunmer, Nesdale, & Wright, 1987) and comprehension skills (Babayiğit & Stainthorp, 2011; de Jong & van der Leij, 2002; Georgiou, Das, & Hayward, 2009; Kendeou, Papadopoulos, & Kotzapoulou, 2013; Megherbi et al., 2006) of good and poor readers. This result demonstrates that good comprehenders decodes words with greater accuracy and speed, and they direct their cognitive resources to reading comprehension instead of word decoding (Rasinski, 2004b).

In conclusion, 2nd grade good comprehenders were performed better at decoding and reading fluency than poor comprehenders. Examining the results as a whole reveals that decoding and fluent reading are significant components of reading comprehension, which is supported by the researches. Readers with good decoding skills are more successful in fluent reading processes, and successful fluent reading skills also support their reading comprehension skills. As a result, it is believed that decoding skills at the 2nd grade level are a necessary component of reading comprehension skills and that by fostering decoding abilities, fluent reading abilities will grow, and substantially support reading comprehension. For this reason, it is critical to provide readers with the required support to develop good decoding skills during the early years of reading acquisition and to monitor readers' decoding abilities on a continuous basis.

When the scores of the 4th grade group with good and poor comprehenders are compared in terms of reading components, it is evident that, while there is no difference between the two groups in terms of real word reading accuracy, the group with good comprehenders performs more successfully in real word reading pace. According to the data, the group with good comprehenders performs better in real word reading pace, indicating that they employ orthographic reading processes. Moreover, the lack of a significant difference in pseudoword reading pace between the two groups and the greater performance of good comprehenders in reading accuracy imply that good comprehenders produced more accurate outputs during phonological decoding processes. The performances of the good and poor comprehenders when reading real and pseudowords suggests that the good group uses orthographic reading when reading real words. In addition, the lack of a substantial difference between the good and poor groups' pseudoword reading paces is a surprising finding. Because good readers in 4th grade are expected to decode pseudowords more quickly given their reading experience. It is believed that the result reached is due to the similarity in letter and syllable structure between pseudowords employed in RSAT and real ones. Grainger and Jacobs (1996) explain this phenomenon as a result of orthographic similarity and assert that it is challenging to decode words with this characteristic. In addition, the literature suggests that the good and poor groups chose the non-lexical route when reading pseudowords, but the good group produced more accurate responses. (Jackson & Coltheart, 2013). The fluent reading performance of good comprehenders is significantly better than poor comprehenders. It is recognized that readers who demonstrate orthographic reading behavior are more successful in fluent reading processes (Georgiou, Parrila ve Papadapoulos, 2008); hence, readers who devote their cognitive resources toward reading comprehension (Ehri, 2005; Perfetti, 1992) are more successful in this process. In addition, the fact that proficient decoders are more likely to correctly decode new words aids their reading comprehension (Hudson et al., 2008). The possibility of meeting new terms increases at the 4th grade level due to the fact that reading behavior is employed as a tool for learning and course content is increasingly complicated and technical. Being able to make successful decoding at this level enables a more effective comprehension of the complex contents. Based on these results, it is apparent that orthographic reading processes enhance fluent reading and both decoding and fluent reading skills are crucial components for comprehension. Risky performances should be supported by assessing the decoding and fluent reading skills of 4th readers, who will be exposed to vastly different course content and school operations the following year. Due to the limitations of these skills, it is believed that readers can be protected from encountering certain learning issues.

The study's last finding is that good comprehenders in the 6th and 8th grades outperform poor comprehenders in fluent reading. This result is confirmed by research indicating that good readers perform better on fluent reading (Ergül, 2012; Sarıpınar & Erden, 2010; Jenkins et al., 2003; Kochnower et al., 1983) than poor readers and that poor readers' reading comprehension skills are also negatively affected as a result (Binder, 1996; Burns et al., 2011; Spencer & Manis, 2010). In addition, it is stated that fluent reading skills are effective on the success of many academic courses at the secondary school level (Bigozzi et al., 2017). Moreover, while it is reported that fluent reading difficulties at the primary school level are transferred to secondary school (Paige & Magpuri-Lavell, 2014), it is stated that the level of fluent reading to explain reading comprehension is 50% in 6th grades and 62% in 7th grades (Paige, 2011). Based on these findings, the effect of fluent reading on reading and academic outcomes does not diminish beyond primary school, and secondary school teachers should not underestimate the detrimental effect of inefficient fluent reading abilities on learning behaviors. Furthermore, the fact that the primary cause of fluent reading difficulties is phonological skill limitations (Adams, 1990; Stanovich, 2000) and that fluent reading processes, including prosodic reading, are fully acquired by the end of the 3rd grade demonstrates that primary school teachers should prioritize the acquisition of fluent reading skills. (Paige, Rasinki, Magpuri-Lavell, & Smith, 2014). On the basis of this knowledge, primary school teachers should continuously evaluate readers' fluent reading skills during the early years, and in this sense, they should implement the essential intervention programs for readers who are likely to be in the risk group.

In general, RSAT is a valid and reliable tool that may be used at many grade levels. It is particularly useful for identifying students at risk of reading failure, monitoring student performance, deciding the content of special education support services, and arranging scientific researches. Nonetheless, it is evident that decoding and fluent reading skills are crucial for reading comprehension at both the elementary and secondary school levels. Taking into account the Matthew Effect on Reading (Stanovich, 2009), it is believed that it is crucial to take the required precautions as early as possible in order to prevent reading difficulties from generating future challenges in other areas.

In conclusion, in light of the study's findings, it is believed that it is necessary to make some recommendations to both field teachers and academicians in order to achieve more successful reading processes. Accordingly, phonological knowledge and skills, which serve as the foundation for decoding skills, must be supported during the preschool years, and performances should be monitored, evaluated and intervened when necessary. Teachers working at the primary school level, where reading instruction begins, are also encouraged to plan, implement, monitor, and evaluate interventions aimed at improving their students' decoding skills, as well as studies aimed at eradicating existing difficulties through the application of a new intervention program in the event of risky performances. Given the difficulties associated with fluent reading skills at the secondary school level, it is advised that the teachers at this level plan appropriate screening and intervention studies as well. Scientists working in the field are also recommended to plan studies with more participants to determine the relationship between the components of decoding and fluent reading with reading comprehension skills and their prediction levels.

One of the limitations of the study is that the study was carried out only with the data collected in the province of Ankara. Repeating the experiments with a larger sample size is believed to provide significant results. Additionally, the absence of evaluation of participants' cognitive abilities (attention span, working memory, rapid naming, etc.) throughout the process of identifying readers with good or poor reading comprehension skills can be regarded a limitation.

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