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Effect of reciprocal teaching on comprehension, attention, rapid naming and working memory

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ABSTRACT This study aims to evaluate word callers attending the fourth grade of primary school in terms of rapid naming, verbal working memory, and attention skills, and to examine the effect of the reciprocal teaching approach on the development of word callers' reading comprehension skills. The study group consisted of 25 word callers and 21 independent readers. Fourth-grade students who are at the independent level in word recognition skills and at the level of frustration in reading comprehension skills are defined as word callers. On the other hand, students who are at the independent level in both word recognition and reading comprehension skills are defined as independent readers. According to the findings, difficulties in rapid naming, verbal working memory and attention skills are common characteristics of word callers. On the other hand, with the reciprocal teaching approach applied for 12 weeks, significant improvements were achieved in the reading comprehension skills of word callers. In this direction, it can be interpreted that the reciprocal teaching approach eliminated the difficulties experienced by word callers.

Keywords: *Reading comprehension, Reciprocal teaching, Word caller*

Karşılıklı öğretimin anlama, dikkat, hızlı isimlendirme ve çalışma belleği üzerindeki etkisi

ÖZ Çalışmanın amacı, ilkokul dördüncü sınıfa devam eden papağan okuyucuları hızlı isimlendirme, sözel çalışma belleği ve dikkat becerileri açısından değerlendirmek ve karşılıklı öğretim yaklaşımının papağan okuyucuların okuduğunu anlama becerilerini geliştirmedeki etkisini incelemektir. Araştırmanın çalışma grubu 25 papağan okuyucu ve 21 bağımsız okuyucudan oluşmaktadır. Araştırmada kelime tanıma becerisinde serbest düzey, okuduğunu anlama becerisinde endişe düzeyinde olan ilkokul dördüncü sınıf öğrencileri papağan okuyucu olarak tanımlanmaktadır. Öte yandan hem kelime tanıma hem de okuduğunu anlama becerisinde serbest düzeyde olan öğrenciler ise bağımsız okuyucu olarak tanımlanmaktadır. Bulgulara göre, hızlı isimlendirme, sözel çalışma belleği ve dikkat becerisinde yaşanan güçlük papağan okuyucuların ortak özelliklerindendir. Öte yandan 12 hafta boyunca uygulanan karşılıklı öğretim yaklaşımı ile papağan okuyucuların okuduğunu anlama becerilerinde ciddi gelişimler sağlanmıştır. Bu doğrultuda karşılıklı öğretim yaklaşımının papağan okuyucuların yaşadıkları güçlükleri ortadan kaldırdığı yorumu yapılabilir.

Anahtar Sözcükler: *Karşılıklı öğretim, Okuduğunu anlama, Papağan okuyucu*

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INTRODUCTION

Reading comprehension is a necessary skill for everyone and reading comprehension difficulties are a problem encountered at all levels of education. Students with this problem need to be supported with interventions that include various strategies. However, there is a group of students who are not included in these intervention studies despite showing symptoms of reading comprehension difficulties. Since this group of readers, called word callers, outperform their peers in reading fluency and word recognition skills, no one accepts that these students are unsuccessful. In other words, their success in word recognition and fluent reading hides their reading comprehension problems. Therefore this study, in which fourth-grade primary school students participated, has two focal points. The first of these focal points is based on Stanovich's (1993) criticism of the inadequacy of the variables used to identify word callers. Accordingly, the first focus of the study is to evaluate word callers in terms of rapid naming, attention, and verbal working memory skills. In addition, the effect of the reciprocal teaching approach on word callers' reading comprehension skills constitutes the other focus of the study.

National Reading Panel (2000) characterized fluency as a neglected goal of reading instruction. This statement in the NRP report, which had a global impact, significantly affected teaching practices. Thus, teachers' over-reliance on certain pedagogical strategies for fluency (Meisinger et al., 2009) may have led to the emergence of word callers, a type of reader that many teachers do not even know about (Hamilton & Shinn, 2003; Meisinger et al., 2010; Meisinger et al., 2009; Shankweiler et al., 1999; Stanovich, 1986). On the other hand, in classrooms where reading aloud is emphasized, the process of meaning construction is often a neglected skill and students in these classrooms think that reading consists of word recognition and sounding out words correctly (Applegate et al., 2009; Jensen & Tuten, 2012). These types of readers, who are thought to emerge as a result of teaching practices that prioritize the speed dimension in fluent reading (Meisinger et al., 2009), exhibit comprehension achievement below their level despite having word recognition and speed reading skills above their level (Couzens, 2013; Grant, 2013; Jensen & Tuten, 2012; Rosston, 2008; Stanovich, 1986). This type of reading has been defined as "reading without meaning" (Grant, 2013) and such readers have been described as "word callers" (Couzens, 2013; Grant, 2013; Hamilton & Shinn, 2003; Meisinger et al., 2009; Rosston, 2008; Shankweiler et al., 1999; Stanovich, 1986).

As can be understood from the definition given above, word callers experience comprehension problems. In such cases, teachers tend to do their best (Tracey & Morrow, 2017) and prepare intervention programs to solve the problems (Johnston et al., 1985). Until the early 1980s, teachers rarely taught strategies to help students with reading comprehension (Rosenshine & Meister, 1994). Especially after the study conducted by Durkin (1981), researchers started to search for strategies to help improve reading comprehension in the 1980s and started to teach cognitive strategies such as questioning and summarizing (Rosenshine & Meister, 1994).

Reciprocal teaching, developed by Palinscar and Brown during these years of searching, is a planned approach to improve reading comprehension through dialogic instruction that features guided practice with simple and concrete strategies for making sense of texts (Aktaş, 2023; Albatool & Moneus, 2023; Bhatti & Shah, 2021; Decristan et al., 2022; Dew et al., 2021; Hwang et al., 2023; Kula, 2021; Mafarja & Zulnaidi, 2022; Palinscar & Brown, 1984). Reciprocal instruction is a combination of four independent comprehension strategies: predicting, questioning, explaining, and summarizing. Palinscar and Brown (1984) emphasize that these four strategies are consistently used by good readers. In the reciprocal teaching approach, the prediction strategy is used before reading, the questioning and clarification strategies are used during reading, and the summarizing strategy is used after reading. This maximizes the effect of the reciprocal teaching approach. In addition, the reciprocal teaching approach was developed to increase the comprehension achievement of readers who are proficient in reading skills but at the level of frustration in reading comprehension (Le Fevre et al. 2003, as cited in Güldenoğlu & Kargın, 2012) and these readers are word callers.

Although theoretical studies on word callers started in the 1980s, it can be said that they remain limited.

One of the reasons for this limitation may be that word callers are competent readers who are able to vocalize words correctly and therefore it is difficult for teachers to identify them. Researchers such as Meisinger et al. (2010); Meisinger et al. (2009), Hamilton and Shinn (2003), in their studies to examine teachers' perceptions of word callers, concluded that teachers were not competent in identifying students who fit the definition of word callers. In addition to these studies, Grant (2013) investigated the effect of comprehension strategies to improve word callers' comprehension skills, DeJournett (2017), Hamilton and Shinn (2003), Knight-Teague et al. (2014), Meisinger et al. (2009), Quirk and Beem (2012) investigated the prevalence of word callers, Dymock (1993) investigated the causes of word callers, and Walczyk and Griffith-Ross (2007) investigated how to help word callers.

The Present Study

The purpose of this study is to evaluate word callers in the fourth grade of primary school in terms of their rapid naming, verbal working memory, and attention skills and to examine the effect of the reciprocal teaching approach on the development of word callers' reading comprehension skills. As can be understood from this purpose statement, the study has two aims. Therefore, the rationales for these two purposes are also different. The first of these justifications is that word callers are defined by considering their achievements in two variables: word recognition and reading comprehension (Couzens, 2013; Stanovich, 1986). Stanovich (1993) criticizes the definition of word callers in terms of two variables, which are so complex and difficult to identify. Increasing the number of variables in defining word callers will allow for narrowing the label that Stanovich (1993) states. Therefore, the current study is also important in terms of eliminating this deficiency in the literature, which Stanovich also mentions.

The rationale for the variables chosen to overcome this deficiency expressed by Stanovich (1993) stems from the fact that rapid naming skill is a significant predictor of both reading (Georgiou & Parrila, 2020; Landerl et al., 2022; Lee et al., 2020; Lin et al., 2020; O'Brien & Yeatman, 2020; Torppa et al., 2020) and reading comprehension (Araújo et al., 2015; Aryadoust, 2020; Landerl et al., 2022; Li et al., 2011; Lovett et al., 2021; McWeeny et al., 2022; Meyer et al., 1998; Pan & Lin, 2023; Torppa et al., 2020) which is one of the important variables in determining word callers'. Another variable, verbal working memory, was preferred because it is also related to reading comprehension skills (Yılmaz & Yaşaroğlu, 2020). On the other hand, (Nation et al., 1999) and (Swanson et al., 2006) revealed in their studies that readers with comprehension problems have a disadvantage in terms of verbal working memory compared to their peers. From this point of view, it is important to examine word callers in terms of verbal working memory. In addition to these, the preference for attention skills was influenced by studies showing that students' comprehension skills improved as a result of interventions aimed at improving attention skills (Solan et al., 2003).

The other rationale for the study is to test the effect of the reciprocal teaching approach on the elimination of the existing problems of Turkish word callers. Although studies on word callers date back to the 1980s, there is a need for intervention studies to overcome the comprehension problems of these students. In addition, the data obtained during the sample determination of the current study is important in terms of giving an idea about the prevalence of Turkish word callers.

METHODOLOGY

Participants

Criterion sampling method, which is one of the purposeful sampling methods, was used in the study. All students who met the criteria in two schools at similar socioeconomic levels were included in the study. These criteria are as follows:
(i) Word callers who are at the independent level in word recognition and at the level of frustration in

reading comprehension.
(ii) Independent readers who are at the independent level in both word recognition and reading comprehension.
(iii) Students who do not have any physical and mental disabilities.
(iv) Students who are not foreign nationals.

The study group consisted of 25 word callers and 21 independent readers who were fourth-grade students attending two primary schools in Mersin, Türkiye in the 2021-2022 academic year. As a first step in the study, classroom teachers were asked to report the students they defined as "the best readers" in their classrooms. Then, the level of word recognition skills of the students reported by the teachers was determined. The reading comprehension skills of the students who were at the independent level in word recognition skills were measured and the students at the level of frustration in comprehension were identified as word callers, while the students at the independent level were identified as independent readers. The reason for including independent readers in the study is to determine whether inadequacy in rapid naming, verbal working memory, and attention skills are common characteristics of word callers. In this direction, it is a prerequisite of the study that word callers and independent readers are at the independent level in word recognition skills and word callers are at the frustration level and independent readers are at the independent level in reading comprehension skills. Therefore, according to the normality test results, the scores of word callers and independent readers for word recognition percentage (ZSkew=1.55, ZKurt=.47) and reading comprehension skill (ZSkew=.085, ZKurt=-1.93) were normally distributed. Based on this result obtained from the normality test, Independent Sample T Test was applied to compare word callers and independent readers in terms of word recognition percentage and reading comprehension scores.

Table 1.
Test Results for Word Recognition Percentage and Reading Comprehension Scores of Word Callers and Independent Readers

	Group	n	x̄	sd	t	p
Word Recognition Percentage	Word Callers	25	99.22	44	.214	.832
	Independent Readers	21	99.19			
	Group	n	x̄	sd	t	p
Reading Comprehension	Word Callers	25	5.32	44	-36.47	.000**
	Independent Readers	21	14.14			

*p < .05; **p < .01

As a result of the analysis, the variances in the word recognition skill data of word callers and independent readers show a homogeneous distribution (F(44)=.005, p=.944). According to the test results in Table 1, there is no significant difference between the word recognition percentage scores of the word caller and independent reader group students (t44=.214, p=.832). In addition, when the table is examined, it is seen that both word callers and independent readers are at an independent level in word recognition skills. In addition, the variances in the reading comprehension skill data of word callers and independent readers do not show a homogeneous distribution (F(44)=23.43, p=.000). Again, according to Table 1, there is a significant difference between the reading comprehension scores of the word caller and independent reader group students (t44=-36.47, p=.000). In addition, when the table is analyzed, it is seen that word callers are at the level of frustration and independent readers are at the independent level in reading comprehension skills. These results show that an inference can be made by comparing word callers and independent readers in rapid naming, verbal working memory and attention skills.

Table 2.
Gender Data of the Study Group

	Group	Gender	n	%
Word Callers	Treatment	Female	5	41.7
		Male	7	58.3
		Total	12	100
	Control	Female	6	46.2
		Male	7	53.8
		Total	13	100
Independent Readers		Female	10	47.6
		Male	11	52.4
		Total	21	100

According to Table 2, 42% of the students in the experimental group were female and 58% were male. In the control group, 46% of the students were female and 54% were male. The treatment and control groups required for the experimental dimension of the study consisted of 25 word callers attending fourth grade in two different primary schools. It can be interpreted that the word recognition scores (Zskew=1.53, Zkurt=.46) and reading comprehension scores (Zskew=.030, Zkurt= -.76) of the groups were normally distributed.

Table 3.
Test Results for Word Recognition Percentage and Comprehension Scores of Treatment Group and Control Group Students

	Group	n	x̄	sd	t	p
Word Recognition Percentage	Treatment Group	12	99.28	23	.795	.435
	Control Group	13	99.15			
	Group	n	x̄	sd	t	p
Reading Comprehension	Treatment Group	12	5.33	23	.055	.957
	Control Group	13	5.31			

As a result of the analysis, it can be interpreted that the variances of the groups showed homogeneous distribution in word recognition (F(23)=.993, p=.329) and reading comprehension (F(23)=.749, p=.396) data. According to Table 3, the students in the groups did not show significant differences in terms of both word recognition (t23=.795, p=.435) and reading comprehension (t44=.055, p=.957) skills. Based on this point, it is possible to assign the groups as treatment and control groups. Therefore, the groups were randomly assigned as treatment and control groups.

Data Collection Tools

The data of the study were collected with the text "Mysterious Living Things" selected from the fourth grade Turkish textbook (Kaftan Ayan et al., 2018) used in the 2018-2019 academic year. In addition, the data of the study were collected through the following data collection tools.

Word Recognition

In the data collection phase of the study, word recognition skills of fourth grade primary school students were first determined. Accurate reading, which is the first developing fluent reading subcomponent in children, is determined by calculating the word recognition percentage. Word recognition percentage is determined by calculating the percentage of words that students correctly vocalized during 60 seconds of reading aloud. Accordingly, the number of words read correctly in 60 seconds is divided by the total number of words read and the word recognition percentage is calculated by multiplying the result by 100 (Akyol et al., 2014).

Reading Comprehension

In the study, the comprehension scale of the Informal Reading Inventory adapted by (Akyol, 2003) was used to measure students' reading comprehension levels. Accordingly, three simple comprehension and three in-depth comprehension questions were created for each text. In simple comprehension questions, 0 points were given to questions that were never answered or answered incorrectly, 1 point to half-answered questions, and 2 points to fully answered questions. In the in-depth comprehension questions, 0 points were given for questions that were never answered or answered incorrectly; 1 point for half-answered questions; 2 points for expected but incomplete answers; and 3 points for complete and effective answers (Akyol, 2019).

Rapid Naming

The rapid naming tests, another material that enabled the collection of the data of the study, consisted of a series of tasks (Araújo et al., 2015; Denckla, 1972; Litt, 2010; Norton & Wolf, 2012; Sideridis et al., 2016; Walker, 2002; Warmington & Hulme, 2012) based on the rapid and accurate naming of colors, numbers, letters, and symbols commonly recognized by children (Denckla & Rudel, 1976a, 1976b; Walker, 2002; Wolf & Denckla, 2005) given in a mixed order. The rapid naming tests were presented on 8.5 x 11″ white, glossy, and thick paper (Neuhaus et al., 2001; Wolf & Denckla, 2005), with stimuli arranged in five rows with 10 items in each row (Jones et al., 2009). Since the efficiency of the rapid naming test depends on the total naming time and the correct naming of the stimuli (Walker, 2002), time is measured and the total time is recorded as a raw score (Denckla & Rudel, 1976a). In the study, the Rapid Naming Test (RNT) adopted by Ergül and Demir (2022) was used to measure students' rapid naming skills. For content validity, the test was presented to 13 experts from five different fields to determine the recognizability of the tasks for students from kindergarten to fourth grade. The averages obtained from the expert opinions showed that there was 90% agreement among the experts.

The construct validity of the test developed with 860 students aged 60-125 months was tested with exploratory factor analysis and confirmatory factor analysis. The variance explained by the four subtests together and under a single factor was found to be 67.53%. Confirmatory factor analysis was tested with model data fit. Considering that the test includes four observed variables, the majority of the goodness-of-fit indices obtained have an acceptable level of model-data fit. As a result of the analyses, it was determined that the four subtasks of RNT had construct validity. On the other hand, when the results of one-way ANOVA and Tamhane Test, one of the ANOVA continuation tests, were taken into consideration, it was also stated that RNT had discriminant validity according to the grade levels (Ergül and Demir, 2022).

The reliability of RNT was tested with the test-retest method. The test was re-administered two weeks later to 86 students randomly selected from among 860 students who participated in the study. With the normal distribution of the data, the reliability coefficient was calculated with the "Pearson Product Moment Correlation Coefficient". With these calculations, it was determined that all four subtasks of the RNT had high reliability in terms of continuity-stability due to the high correlation.

Nonword Repetition List

In the study, the Nonword Word Repetition List (NWRL) developed by Akoğlu and Acarlar (2009 as cited in Akoğlu, 2011) for children aged 3-9 years was used to measure the verbal working memory of fourth-grade primary school students. The list of 36 nonwords was administered to 152 children between the ages of 3-9 and the inter-rater reliability was found to be 83% (Akoğlu, 2011; Akoğlu & Acarlar, 2014). In order to measure verbal working memory skills, participants were individually assessed in a quiet part of the school. During the data collection phase with NWRL, students were asked to repeat the words they listened to. In this direction, headphones and a voice recorder were used to prevent noise from the environment. In order for the students to hear the words more clearly, a headset with noise canceling feature was used (Rampage Rm-k48 X-coral). The necessary permissions for the NWRL were

obtained via e-mail.

Bourdon Attention Test

The test consists of two different forms; in the first form, the task is to find and mark certain letters among the mixed letters; in the second form, the task is to find and mark certain shapes among the mixed shapes. There are 660 letters in total in the letter form of the test. The shape form of the test consists of one page with a total of 450 small shapes. In the evaluation of the test, the number of correct, time or number of errors can be taken into consideration. In this study, the letter form of the Bourdon Attention Test was used. The validity and reliability studies of the Bourdon Attention Test were conducted by Karaduman (2004) with 150 fourth and fifth grade students. The reliability of the test was tested by the test-retest method and the correlation coefficient was found to be .78. On the other hand, the validity of the test was tested with the d2 attention test and the correlation between the tests was found to be .63 (Karaduman, 2004). The necessary permissions for the use of the Bourdon Attention Test in the present study were obtained via e-mail.

Data Collection Procedure

The preparation phase of the study started with obtaining the necessary permissions. Firstly, a document dated 02.11.2021 and numbered 17 was obtained from Gazi University Ethics Commission showing the ethical suitability of the study. Then, primary schools with 200 or more fourth grade students in Mersin were identified and the necessary procedures were initiated for the application permit from Mersin Provincial Directorate of National Education. In this process, expert opinion was also obtained about the illustrated children's books to be used in the study. Three faculty members teaching Children's Literature in the Department of Classroom Education were contacted and informed about the study and the study group. The experts were asked to report 15 illustrated children's books. Of the picture books reported by the experts, 24 were provided as research materials.

After obtaining the necessary permissions, word caller identification studies were started. In order to save time, not every student in the school was included in the identification studies. Instead, a meeting was held with the teachers and they were asked to report the students they identified as successful in reading in their classes. At the same time, the students forming the independent reader group were also tried to be identified. Therefore, students who were at the independent level (99+) in word recognition skills and at the frustration level (0-50%) in reading comprehension skills were classified as word callers and students who were at the independent level in both word recognition and reading comprehension skills were classified as independent readers. Accordingly, 52 students were reported by the teachers in a school with six fourth grade classes. As a result of the measurements, 15 students were assigned to the word callers group and 10 students to the independent reader group. Since one teacher did not allow her students to participate in the study, the number of word callers was reduced to 12. The determination of the control group was carried out in a primary school at a similar socioeconomic level (SES). Likewise, a meeting was held with the teachers after obtaining the necessary permissions from the administrators. In this meeting, information about the study was given. Teachers were also asked to report the most successful students in their classes in terms of reading. Among the 72 students reported by the teachers, 13 students were word callers and 10 students were independent readers.

The schools where the study group continued their education are located in the same district. There are a total of 24 primary schools in the district. In order to control variables such as family education status and socioeconomic level, the two primary schools were selected to be located at the same socioeconomic level. The demographic data of the neighborhoods where both schools are located were obtained for a fee from the real estate evaluation platform (Endeksa, 2023). Accordingly, the neighborhoods where the treatment and control group elementary schools are located are in the lower middle socioeconomic level (Endeksa, 2023).

In the primary school where the treatment group students took part in the study, there are 28 classes, six

of which are in the fourth grade. In addition, there are 46 teachers, two vice principals, one principal and one counselor in the school, which has 860 primary school students. Due to the high level of migration in Mersin province, there were 83 foreign students in the treatment group, most of whom were Syrian nationals. On the other hand, classes consisted of 30 students on average. In the primary school where the control group students were located, there were 21 classes, five of which were in the fourth grade. There are 670 primary school students in the school where 30 teachers, two vice principals, one principal and one guidance counselor work. In addition, 39 of these students are foreign students. Classes consisted of 30-35 students on average.

After identifying the students and assigning them to groups, the data for the survey dimension of the study were collected. This process took five working days. The experimental process was planned for two days a week and 12 weeks. The sessions covered two class hours in the afternoon. Therefore, the experimental process of the study lasted 12 weeks, 24 days, and 48 class hours. On the other hand, picture books were used in the 12-week experimental process based on the reciprocal teaching approach.

The first lesson was devoted to introduction and introduction of the four sub-strategies that make up the reciprocal teaching approach. The strategies were associated with the four heroes in order for students to comprehend these strategies more easily. The characters of Popeye the Strong Predictor for the prediction strategy, Nasrettin Hodja the Questioner for the inquiry strategy, Keloğlan the Careful Explainer for the explanation strategy, and Dede Korkut the Excellent Summarizer for the summarization strategy were used. In addition, each character was paired with a material for students to adopt these characters and thus the strategies more easily. The Strong Predictor Popeye was paired with hand weights (1 kg dumbbells), the Questioner Nasrettin Hodja with a magnifying glass, the Careful Explainer Keloğlan with unnumbered glasses, and the Excellent Summarizer Dede Korkut with a fez.

In order to model the process, the researcher vocalized the book “Ernest” with the think-aloud method. First of all, he examined the front cover, back cover, title, author, publisher and the visual on the cover. Then, he took the hand weight and said, “Now I am Popeye, the Strong Predictor. I will make predictions about the book. The animal on this cover could be a horse, donkey or deer. Aaa! Wait a minute, a horse or donkey does not have horns. Then it could be a deer. If we look carefully at the deer's face we can see that it's unhappy. It looks like it has a problem... Could this problem be that it has no friends?” After this modeling, the stage of vocalizing the book was started. The students were seated according to the crescent seating arrangement, the book was facing the students and after making sure that each student could see the book clearly, the vocalization started. In order to model the second strategy of questioning, the researcher put down the hand weight and picked up the magnifying glass. After the sentence “Smart Mini has come up with a brilliant idea.”, the researcher said “Here is the perfect place for a teacher to ask questions to his students.” and then asked “The questioner Nasrettin Hodja is talking, what do you think Smart Mini has come up with?” by bringing the magnifying glass in his other hand closer to the page. Immediately after the question, the researcher put on the glasses and took on the role of the Careful Explainer Keloğlan and answered the question. In addition, the researcher explained the meaning of the word “cellotape”, which he thought the students did not know the meaning of. In this way, it was emphasized that the task of the Careful Explainer Keloğlan was not only to answer the questions of the Questioner Nasrettin Hodja, but also to explain the words and sentences in the book whose meaning was unknown. Finally, the researcher modeled the Excellent Summarizer Dede Korkut using the fez after the book was read aloud. In order to create the summary, the researcher thought aloud the plot of the story, expressed the main idea of the story by referring to the heroes of the story, the places and time in which the event took place, and completed the summarization process.

Starting from the second week of the implementation, one week was allocated to each of the four strategies. For example, while the second week focused intensively on the prediction strategy, the third week focused on the questioning strategy. In each session starting from the fifth week, activities were conducted on all strategies. For the remaining seven weeks, the word callers experienced the reciprocal teaching approach both in small groups and individually. In addition, the word callers practiced the strategies using the materials specified for each strategy.

Data Analysis

Skewness and kurtosis values were taken into consideration to determine the normality of the data. The skewness and kurtosis values of the variables within the range of ± 2 indicate a normal distribution (George & Mallery, 2001). As a result of the results obtained from the normality test, Independent Sample T-Test or Mann Whitney U Test was used to compare the treatment and control groups, and Paired Samples T Test or Wilcoxon Signed Ranks Test was used to compare the groups within themselves as pretest and posttest. However, in the analysis of the post-test data, "Analysis of Covariance with One Factor (ANCOVA)" was used in order to overcome this limitation inherent in quasi-experimental studies. Because ANCOVA has two main advantages over ANOVA. These are; (i) reducing the error variance and (ii) reducing the bias in experimental studies (Büyüköztürk, 2017, p. 121). In other words, "ANCOVA" analysis makes it possible to determine the real effect of the process in the experiment by eliminating the external factors that cannot be controlled by the research design with a linear regression method" (Büyüköztürk, 2017). In these tests, the significance value was accepted as 0.05. These tests were conducted with the help of SPSS 24 package program (IBMCorp., 2016).

FINDINGS

Rapid naming skills were determined with the RNT. The test consists of four different tasks: object naming, color naming, letter naming and number naming. When the normality of the student scores of these tasks was analyzed, the object naming (ZSkew=287, ZKurt= -.657), letter naming (ZSkew=.008, ZKurt=-1.179) and number naming (ZSkew=.354, ZKurt= -.598) tasks were normally distributed, while the color naming (ZSkew=1.835, ZKurt= 6.491) task was not normally distributed. From this point of view, Independent Sample T Test and Mann Whitney U Test were applied to compare word callers and independent readers in terms of rapid naming skills.

Table 4.
Results of Word Callers and Independent Readers' Scores on RNT Tasks

	Groups	n	x̄	sd	t	p
RNT Object	Word Callers	25	44.32	44	9.75	.000**
	Independent Readers	21	31.43			
	Groups	n	x̄	sd	t	p
RNT Letter	Word Callers	25	23.28	44	11.05	.000**
	Independent Readers	21	16.48			
	Groups	n	x̄	sd	t	p
RNT Number	Word Callers	25	25.44	44	9.53	.000**
	Independent Readers	21	18.48			
	Groups	n	Rank Av.	U	Z	p
RNT Color	Word Callers	25	33.68	8.00	-5.63	.000**
	Independent Readers	21	11.8			
	Total	46	41.54			

*p < .05; **p < .01

As a result of the analysis, the variances were homogeneously distributed (F(44)=2.136, p=.151) and there was a significant difference between word callers (x̄=44.32 seconds) and independent readers (x̄=31.43 seconds) in object naming among RNT tasks in favor of independent readers (t44=-9.75, p=.000). According to the table, it is seen that there is a significant difference between word callers and independent readers in color naming, one of the RNT tasks, in favor of independent readers (D=46, Z=-5.63, p=.000). Similarly, the variances were homogeneously distributed (F(44)=.688, p=.411). In letter naming, one of the RNT tasks, there was a significant difference between word callers (x̄=23.28 seconds) and independent readers (x̄=16.48 seconds) in favor of independent readers (t44=-11.05, p=.000). Finally, the variances were not homogeneously distributed (F(44)=6.894, p=.012). It is seen that there is a significant difference between word callers (x̄= 25.44 seconds) and independent readers (x̄=18.48

seconds) in favor of independent readers (t44=-9.53, p=.000). When Table 4 is examined in general, it is seen that there is a significant difference in favor of independent readers in all RNT tasks. Therefore, based on these results, it can be interpreted that fast naming skill is one of the variables that can be used to distinguish word callers, since there is a significant difference in all four subtasks that constitute fast naming skill and these differences occur in favor of independent readers.

In the study, students' verbal working memory skills were measured with the Nonword Repetition List (NWRL). The list consists of 36 nonwords and the number of phonemes correctly produced by the participants is taken into account. When the normality of the scores for the NWR list was analyzed, it was concluded that the data were normally distributed (ZSkew= -.496, ZKurt= -.669). Based on this point, Independent Sample T-test was applied to compare word callers and independent readers in terms of verbal working memory skills.

Table 5.
Results of NWRL Scores of Word Callers and Independent Readers

	Groups	n	x̄	sd	t	p
Verbal Working Memory	Word Callers	25	193.40	44	-10.06	.000**
	Independent Readers	21	204.29			

*p < .05; **p < .01

As a result of the analysis, when Table 5 is examined, it is seen that there is a significant difference between word callers (x̄=193.40) and independent readers (x̄=204.29) in favor of independent readers (t44=-10.061, p=.000) according to the scores of the NWRL measuring verbal working memory skill (F(44)=13.077, p=.001). Based on these results, when the number of correctly produced phonemes in the NWR list is analyzed, it can be interpreted that verbal working memory skill is one of the variables that can be used to distinguish word callers since independent readers produce more correct phonemes than word callers and the difference is significant.

When the normality of these scores of the attention test was analyzed, it was concluded that the data were normally distributed (ZSkew= -.602, ZKurt= -1.09). Based on this point, Independent Sample T-test was applied to compare word callers and independent readers in terms of attention skills.

Table 6.
Results of Attention Test Scores of Word Callers and Independent Readers

	Groups	n	x̄	sd	t	p
Attention	Word Callers	25	73.80	44	-10.67	.000**
	Independent Readers	21	103.38			

*p < .05; **p < .01

According to Table 6, there is a significant difference between word callers and independent readers in favor of independent readers in terms of attention skill (t44=-10.67, p=.000), where variances do not show homogeneous distribution (F(44)= 60.04, p=.000). According to the test, out of 110 points, word callers received an average score of 73.80 and independent readers received an average score of 103.38. This score difference between the averages is another indication that there is a significant difference between word callers and independent readers in terms of attention skills. Based on these results, it can be interpreted that attention skill is one of the variables that can be used to distinguish word callers.

In order to determine the effect of the reciprocal teaching approach on reading comprehension skills, normality test was performed to decide on the test to be applied and it was determined that the post-test reading comprehension data of the groups showed normal distribution (ZSkew=.043, ZKurt= -1.73). In line with the results obtained from the normality test, ANCOVA test was applied to compare the two independent groups, treatment and control groups, in terms of reading comprehension.

Table 7.
Descriptive Statistics of Comprehension Scores by Groups

Group	n	Mean	Adjusted Average
Treatment	12	12.83	12.86
Control	13	5.38	5.31

When the adjusted mean of the post-test reading comprehension scores in Table 7 is analyzed, it is 12.86 for the treatment group and 5.31 for the control group. In addition, as a result of the analysis, the variances of the posttest reading comprehension scores were homogeneously distributed (F(23)=.14, p=.906). ANCOVA results for the significance of the difference observed in the post-test reading comprehension scores of the treatment and control groups are presented in the table below.

Table 8.
ANCOVA Results of Posttest Comprehension Scores of Treatment and Control Group Students

	Posttest scores			Estimated marginal means		F(1, 23)	η^2 p
Group	N	M	SD	M	SE	138.715	.000**
Treatment	12	12.83	1.74	12.83	.83		
Control	13	5.38	1.61	5.38	.83		

*p < .05; **p < .01

According to the ANCOVA results in Table 8, there was a significant difference between the posttest reading comprehension scores of the treatment and control group students in favor of the treatment treatment group (F(1, 22)=138.71, p<.05). On the other hand, considering the effect size obtained as a result of the analysis, it can be interpreted that the reciprocal teaching approach is effective in improving the reading comprehension skills of word callers based on the fact that it explains 86% of the variance.

Finally, an important finding is related to the reading speed of word callers. As shown in Table 9, 10 of the 12 word callers in the treatment group showed a decline in their reading speed from the pretest to the posttest. However, they showed a significant increase in their reading comprehension scores. This data is an indication that word callers focus on completing the text quickly instead of constructing meaning during reading.

Table 9.
Treatment Group Students' Pre-Test and Post-Test Number of Words Read Per Minute and Comprehension Scores

Code	Pre-test reading speed	Pre-test comprehension	Post-test reading speed	Post-test comprehension
K1	117	4	107	14
K2*	101*	5*	111*	14*
K3	109	7	107	14
K4	119	7	115	12
K5	111	4	104	14
K6	101	3	92	8
K7	114	6	109	12
K8*	99*	5*	103*	12*
K9	146	5	115	13
K10	129	6	124	13
K11	129	7	121	14
K12	128	5	117	14

DISCUSSION AND CONCLUSION

According to the findings obtained in the research, independent readers performed better than word callers in rapid naming, verbal working memory and attention skills. Therefore, just like reading comprehension, difficulty in these skills is a common characteristic of word callers. Thus, Stanovich's (1993) criticism, which is one of the foundations of this study, was addressed. Having more information

about word callers will serve the literature in identifying these readers and narrowing the word callers label.

The slowness of naming speed, in other words, the prolonged completion time of RNT tasks, indicates the presence of reading comprehension problems (Arnell et al., 2009). Considering that word callers are behind their peers in reading comprehension, the difficulty in rapid naming skills is not surprising. In addition, the fact that the naming speed of word callers who are disadvantaged in terms of reading comprehension is low, while the naming speed of independent readers is high supports the studies in the literature reporting a relationship between rapid naming skills and reading comprehension (Araújo et al., 2015; Li et al., 2011; Meyer et al., 1998).

Another variable that contributes to the literature in terms of diagnosis is verbal working memory and word callers also have a disadvantage in verbal working memory. While verbal short-term memory represents passive storage, verbal working memory represents the processing and storage of acquired verbal information (Yılmaz & Yaşaroğlu, 2020). Therefore, verbal working memory is more important for reading comprehension. For example, researchers such as Cain (2006) and Nation et al. (1999) argue that there is no relationship between verbal short-term memory and reading comprehension. However, in the study conducted by Cain et al. (2004), it was stated that verbal working memory predicted reading comprehension skills better. Swanson and Howell (2001) attributed this to the fact that short-term memory and working memory are independent of each other. On the other hand, Rosston (2008) observed a significant difference between Hispanic fifth and sixth grade word callers and their normal peers in terms of working memory and this finding is similar to the findings obtained in the current study.

On the other hand, word callers are also behind their peers who are independent readers in terms of attention skills. Comprehension difficulty is a learning disability (Uçar Rasmussen & Cora İnce, 2017). Learning disabilities are often accompanied by attention deficits. In fact, in a clinical study conducted by Mayes et al. (2000) with the participation of 73 children, it was stated that 82.2% of children with learning disabilities were accompanied by attention deficit. Of this 82% group of students, 31.4% were included in the study due to reading comprehension difficulties. The significant difference between independent readers and word callers confirms the findings of studies (Çakıroğlu, 2020; Çelik et al., 2018; Karaman et al., 2006; Mayes et al., 2000; Miller et al., 2013) claiming that attention deficit accompanies learning disabilities.

In the experimental dimension of the study, it was aimed to improve the reading comprehension skills of word callers with the reciprocal teaching approach applied for 12 weeks. According to the results obtained, the reciprocal teaching approach is effective in solving the existing reading comprehension problems of word callers. Therefore, the results obtained in the current study support the studies reporting that the reciprocal teaching approach improves readers' reading comprehension skills (A'yun & Yunus, 2017; Carter, 1997; Grant, 2013; Okkinga et al., 2018; Takala, 2006). As it is known, the reciprocal teaching approach consists of predicting, questioning, explaining, and summarizing strategies, which are comprehension strategies in themselves. When these strategies are examined, predicting is a strategy that addresses pre-reading, questioning, and explanation are strategies that address reading order, and summarizing is a strategy that addresses post-reading. Therefore, it can be interpreted that the strategies to be used in all stages of reading are effective on word callers. The findings also prove that students' reading comprehension skills improve as a result of teaching comprehension strategies. However, students are generally not taught how to comprehend the text, but it is questioned whether the students understand the text (Ateş, 2011; Pressley et al., 1998; Rosenshine & Meister, 1994). This misapplication causes students to just vocalize the text without following the meaning and focusing on the meaning, leading them to become word callers. On the other hand, many researchers claim that metacognitive strategies have an important role in reading comprehension (Ceylan & Harputlu, 2015). Dymock (1993) reports that word callers cannot perceive metacognitive strategies. Le Fevre et al. (2003) report that reciprocal teaching is an intervention approach that includes cognitive and metacognitive instruction in the reading comprehension process (as cited in Güldenoğlu

& Kargın, 2012). Therefore, the reciprocal teaching approach may have been effective both because it addresses reading holistically and because it uses metacognitive strategies that word callers have difficulty in perceiving.

Implications

This study was conducted to evaluate word callers in the fourth grade of primary school in terms of rapid naming, verbal working memory, and attention skills, and to examine the effect of the reciprocal teaching approach on the development of word callers' reading comprehension skills. With this study, the criticisms in the literature about the lack of criteria used to identify word callers were tried to be eliminated. It is an important finding that word callers have disadvantages in terms of rapid naming, verbal working memory, and attention skills compared to their peers who are independent readers. Thus, when identifying word callers, it may be a condition that they have problems in these three variables as well as word recognition and reading comprehension skills. In this way, word callers can be identified with a more accurate percentage and the intervention programs to be implemented will include activities to improve rapid naming, verbal working memory, and attention skills. In addition, with the current study, the effect of the reciprocal teaching approach on word callers' comprehension problems was also seen.

Limitations of the Research and Recommendations for Future

One of the limitations of the study is that the stopwatch used for time measurement in the data collection phase of the study was positioned in a way that students could see it. This is the most serious limitation of the study as it may cause students to feel like they are in a race. It is recommended that future researches pay attention to this limitation in the current study and position the stopwatch in a way that students cannot see it during time measurement. Another limitation of the study is that the study group consisted of fourth grade primary school students. The frequency of word callers is directly proportional to the grade level. Based on the idea that the number of word callers who can form treatment and control groups can be determined more easily in the fourth grade of primary school, the current study was limited to fourth grade students. Based on this limitation, it is recommended that future studies should cover the entire primary school.

In addition to these suggestions, it is recommended that both teachers and researchers take into account the performance of word callers in rapid naming, verbal working memory and attention skills, which are very difficult to identify. The present study is the first example of a study involving Turkish word callers. Determining the frequency of Turkish word callers in the education system is an important issue. Therefore, it is recommended for researchers to determine the frequency of word callers in Turkish education system in future studies.

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TÜRKÇE GENİŞLETİLMİŞ ÖZET

Anlama güçlüğü eğitimin her kademesinde ciddi bir problem olarak süregelmektedir. Anlama güçlüğünden mustarip olan öğrencilere uygulanacak müdahale programlarıyla var olan problemler giderilmektedir. Ancak papağan okuyucular gibi eğitim kademelerinde genellikle "başarılı öğrenci" olarak tanımlanan öğrencilerin anlama problemleri fark edilememektedir. Çünkü bu öğrencilerin akıcı okuma ve hızlı kelime tanıma becerileri anlama becerisine oranla daha iyi seviyede olduğu için bu öğrenciler anlama becerisinde de başarılıymış gibi sınıflandırılmaktadır. Bu durum gerek papağan okuyucularla gerçekleştirilen çalışmalarının sayısının azlığından gerekse bu özel okuyucu grubuna yönelik müdahale strateji ve yaklaşımlarının geliştirilmemiş olmasından anlaşılmaktadır.

Bu özel öğrenci grubu kelimeleri oldukça akıcı ve hızlı bir şekilde seslendirmektedir. Ancak anlama becerileri akıcı okuma ve okuma hızlarına eşlik edememektedir. Bu durumun başlıca sebebi öğretmen yaklaşımlarıdır. Akıcı okumanın ve hızlı okumanın sık sık vurgulandığı ve akıcı ve hızlı okuyan öğrencilerin sık sık ödüllendirildiği sınıflarda papağan okuyucuların görülme sıklığı artmaktadır. Ancak anlama olmadan yapılan okumanın herhangi bir değerinin olmadığı unutulmamalıdır. Öğretmenler veya ebeveynler tarafından okuma hızının sıklıkla vurgulanması ile birlikte çocukların okumadaki odak noktaları da değişmektedir. Bu tür okuyucular, okuma eylemini metinden anlam üretmek yerine metni herkesten önce tamamlamak amacıyla gerçekleştirmektedirler. Alan yazın incelendiğinde, öğrencilerin birer papağan okuyucu olmasının en büyük nedeni olarak öğretmen davranışları gösterilmektedir (Applegate ve diğerleri, 2009; Hamilton ve Shinn, 2003; Jensen ve Tuten, 2012; Meisinger ve diğerleri, 2009). Bunun dışında, papağan okuyucuların üst düzey düşünme süreçlerini algılayamaması (Dymock, 1993), karşılaştıkları metinlerin oldukça kolay olması (Walczyk ve Griffith-Ross, 2007) gibi nedenler de alan yazında yer almaktadır.

Alan yazında papağan okuyucuların katılımıyla gerçekleştirilen çalışmaların genellikle bu özel okuyucu grubunun eğitim sistemindeki sıklığı üzerine yoğunlaştığı görülmektedir. Gerçekleştirilen bu çalışmalardan çıkan ortak sonuç ise papağan okuyucuların ilkokul düzeyinde yaygın olmadığı yönündedir (Hamilton & Shinn, 2003; Meisinger ve diğerleri, 2009). Buna ek olarak bu okuyucu grubunun sayısı eğitim kademeleri yükseldikçe artmaktadır (Meisinger ve diğerleri, 2009; Quirk ve Beem, 2012). Alan yazında yer alan bir grup çalışmada ise papağan okuyucuların yaygınlığının oldukça yüksek olduğu yönündedir. Quirk ve Beem (2012) yapmış oldukları çalışmada, ilkokulda papağan okuyucuların var olma oranının %14 ile %21 aralığında olduğunu rapor etmişlerdir.

Bu çalışma, dördüncü sınıf papağan okuyucuları dikkat, sözel çalışma belleği ve hızlı isimlendirme becerileri açısından değerlendirmek ve karşılıklı öğretimin bu okuyucuların okuduğunu anlama becerilerini geliştirmedeki etkisini ortaya koymak amacıyla gerçekleştirilmiştir. Araştırmanın katılımcıları olan dördüncü sınıf öğrencileri Mersin ilinde iki ayrı ilkokulda öğrenim gören 21 bağımsız okuyucu ve 25 papağan okuyucudan oluşmaktadır. Araştırmada kelime tanıma becerisi; kelime tanıma yüzdesiyle, okuduğunu anlama becerisi; basit ve çıkarımsal anlama sorularıyla, dikkat becerisi; Bourdon Dikkat Testiyle, hızlı isimlendirme becerisi; HİT ile ve sözel çalışma belleği becerisi; AST ile ölçülmüştür. Araştırmanın uygulama aşaması 12 hafta boyunca sürmüştür. Bu kapsamda dört alt stratejiden oluşan ve her biri mahalli olarak birer anlama stratejisi olan karşılıklı öğretim yaklaşımı kullanılmıştır. Bu 12 haftalık müdahale sürecinde 24 oturum gerçekleştirilmiştir ve her oturumda farklı bir resimli çocuk kitabıyla karşılıklı öğretim süreci yönetilmiştir. Araştırmada elde edilen verileri analiz etmede ise SPSS paket programı kullanılmıştır. Gerçekleştirilen analizler sonucunda, papağan okuyucular ile bağımsız okuyucular arasında dikkat, sözel çalışma belleği ve hızlı isimlendirme becerisi açısından anlamlı farklılıklar görülmüştür. Bu anlamlı farklılıklar bağımsız okuyucular lehinedir. Dolayısıyla okuduğunu anlama becerisine ek olarak papağan okuyucuların dikkat, sözel çalışma belleği ve hızlı isimlendirme becerilerinde de sorunlara sahip olduğu yorumu yapılabilir. Bu da papağan okuyucuların öğretmenler ve araştırmacılar tarafından daha hassas bir biçimde tespit edilmesinin önünü açacaktır. Ayrıca geliştirilecek müdahale programlarında bahsi geçen bu becerileri de geliştirecek etkinliklere yer verilmesinin önü açılacaktır. Öte yandan mevcut araştırmada karşılıklı öğretim

yaklaşımına göre planlanan müdahale programının papağan okuyucuların anlama becerilerini geliştirdiği de bir diğer önemli bulgudur.

Bu çalışmayla birlikte, papağan okuyucuları tespit etmede kullanılan kriterlerin azlığına yönelik literatürde yer alan eleştiriler giderilmeye çalışılmıştır. Araştırmada ortaya çıkan papağan okuyucuların hızlı isimlendirme, sözel çalışma belleği ve dikkat becerileri açısından bağımsız okuyucu olan akranlarına göre dezavantajlara sahip olması önemli bir bulgudur. Böylece papağan okuyucular tespit edilirken kelime tanıma ve okuduğunu anlama becerilerinin yanı sıra bahsi geçen bu üç değişkende de problem yaşamaları şart olarak aranabilir. Bu sayede papağan okuyucular daha doğru bir yüzdeyle tespit edilebilecek ve uygulanacak müdahale programlarında hızlı isimlendirme, sözel çalışma belleği ve dikkat becerilerini geliştirmeye yönelik etkinlikler de yer alacaktır. Ayrıca mevcut çalışmayla birlikte papağan okuyucuların anlama problemlerini gidermede karşılıklı öğretim yaklaşımının da etkisi görülmüştür.