

Arabic Reading Comprehension and Curriculum Based Measurement

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Abstract

The primary objective of this study was to evaluate whether students using a multicomponent intervention for reading comprehension (RC) would increase their RC scores in comparison to students who learned under traditional instruction. A total sample of 66 fifth-grade students participated in the study. This paper presents a comparison study of two groups: the first group received specific RC strategies and the second group received traditional way of teaching RC which relies heavily on questioning the students after reading silently selected text. The intervention was implemented for 18 weeks. The results indicated that students in the treatment class outperformed students in the comparison class on the standardized RC measure and the CBM Maze progress.

Keywords: Arabic reading, curriculum based measurement, reading comprehension instruction, student with reading difficulties.

Introduction

Reading comprehension (RC) can be defined narrowly as instruction that promotes the ability to learn from text or more broadly as instruction that gives students access to important domains of knowledge and provides a means of pursuing affective and intellectual goals (RAND Reading Study Group, 2002). From either perspective, RC instruction necessarily entails multiple teaching procedures designed to promote students' acquisition of numerous comprehension skills and strategies. Although good instruction is the most powerful means of promoting proficient comprehension and preventing comprehension problems (James-Burdumy et al., 2009; Klingner, Vaughn, Argu`elles, Hughes, & Ahwee, 2004), studies conducted across the last 30 years suggest that inadequate time and attention to comprehension instruction is a factor that contributes to the state of poor comprehension among students. In the late 1970s, Delores Durkin (1978-79) found that only 2% of the time designated for reading instruction was used to actually teach students how to comprehend what they read. Another study conducted by pressley (2000) indicates that this situation has not changed much in the last 20 years despite a growing base of knowledge supporting the value of comprehension instruction.

Focusing on the area of comprehension strategies or instruction, teachers are discovering that RC is not something children acquire as they read (Harvey & Goudvis, 2000). Many teachers use the phrase, "In order to become a better reader you have to read, read, read. Although it is true that this might help increase children's fluency, vocabulary and even their background knowledge, it will not help them gain valuable comprehension skills needed to gain more understanding from the text (Mason, Meadan, Hedin, & Corso, 2006). Many struggling readers are able to decipher and decode what they are reading, but they get little out of their reading beyond that. If these students are to be able to continue to grow as readers, they must be intentionally taught the important reading strategies they need to gain and construct meaning from what they read. These children need to see these strategies modeled, they need to be led through guided practice, and finally they need to be given time to practice these strategies independently. The explicit teaching of RC strategies can help catapult all struggling readers into a zone where they can gain the self-confidence they need to go on to become successful readers (Geary, 2006).

When a child's reading problems are recognized early, school failure can to a large extent be prevented or reduced (Raikes et al., 2006). Early intervention to prevent development of reading difficulties can be an effective way to ameliorate this problem (Torgesen et al., 1999), and screening and progress monitoring can identify students who require such intervention (Compton, Fuchs, Fuchs, & Bryant, 2006). In view of this fact, it is of critical importance to have a valid and reliable assessment instrument to be used in identifying students who are at-risk of reading failure. A commonly used and well-researched method for assessing students' RC ability is curriculum based measurement (CBM; Deno, 1985, 2003).

Curriculum Based Measurement (CBM)

CBM is considered to be a type of authentic assessment practice that is designed to provide prevention and intervention services to students (Hoover & Mendez-Barletta, 2008). CBM's validity and reliability are well established (National Center on Response to Intervention, 2010). CBM is a set of standardized procedures that were initially designed to index the level and rate of students' achievement within the basic skill areas of reading, mathematics, written expression, and spelling (Deno, 2003). Within academic settings, CBM is useful for: (a) establishing norms for screening and identifying students in the need of special education services, (b) identifying students for special education evaluation who demonstrate a low level of performance and inadequate rate of improvement, (c) monitoring student progress, and (d) planning effective instruction in the general education classroom (Stecker, Fuchs, & Fuchs, 2005).

CBM Maze

On typical CBM Maze tasks, students are presented with a passage of approximately 250 words in which every seventh word has been deleted and replaced with three options. In regard to the psychometric properties, CBM Maze has been shown to provide a valid and reliable measurement of reading skills across different grades in school (Brown-Chidsey, Davis, & Maya, 2003; Miura-Wayman, Wallace, Ives-Wiley, Ticha, & Espin, 2007; Shinn, Deno, & Espin, 2000). Results from previous research have indicated that the Maze has adequate technical characteristics, is sensitive to improvement of student performance over a school year, and can reveal inter-individual differences in growth rates (Shin et al., 2000). Moreover, several studies support the alternate form reliability, sensitivity to growth, and predictive validity of CBM Maze (e.g., Espin, Wallace, Lembke, Campbell, & Long, 2010; Shin et al., 2000).

Although the previous documented research supported the psychometric prosperities of CBM Maze in English, only one study has been conducted to explore CBM Maze in Arabic language (Abu-Hamour, 2013a). This study examined the applicability of Arabic version of the CBM Maze for 150 fourth-grade Jordanian students. Promising results of this study indicated that the Arabic CBM Maze was a valid, reliable, and cost effective measure. In addition, Arabic CBM Maze was a good predictor of Arabic language Grade Point Average. Moreover, the researcher concluded that Arabic CBM Maze may be used with confidence to differentiate students' levels of reading achievement.

Arabic Language

Alphabetic orthographies (eg., Arabic) use symbols or letters to represent different sounds of speech in writing. In simplest alphabetic systems, such as Turkish and Finnish, each symbol or grapheme is used to represent a single sound or phoneme (McDougall, Brunswick, & de Mornay Davies, 2010). This one-to-one correspondence between letters and sounds is unusual, however, with most alphabetic orthographies presenting a number of irregularities that make reading unpredictable and challenging. The term orthographic depth is often used to describe the degree of correspondence between the sounds in a language and the letters that represent these sounds in writing. Under the umbrella of orthographic depth, languages that map each sound to a specific letter are known as "shallow or transparent orthographies." In contrast, orthographies with multiple mappings between sounds and letters are known as "deep or opaque orthographies" (Frost, 2007).

Arabic language is transparent in the introductory phase of instruction in kindergarten or Grade 1. In Arabic texts, letters are used to represent consonants, and vowels are denoted with diacritics markings (dots or lines) placed above or below the consonants. Words are derived from two- or three-consonant root morphemes, and vowels and affixes are added to these roots to create variations of meaning and denote parts of speech. Thus, inclusion of vowel diacritics, or "vowelization," provides the beginning reader with additional phonological information that helps them to detect the intended meaning and correct pronunciation of words.

Around the end of Grade 3, when basic decoding skills have been mastered by most typically developing children, vowel diacritics are dropped from the majority of texts. At this juncture, the orthographies transition from being shallow and transparent to being deep and opaque (Abu-Rabia, 2000; Share, 2008).

Orthography, or how a language is represented in writing, impacts RC development and can present varying obstacles to individuals with reading difficulties. Because the way we read words depends on the nature of the language we speak, the complexity of the language dictates which characteristics of dyslexia or reading difficulties will be the most significant. The characteristics of the orthography and the language that it maps onto, pose different challenges to beginning readers, and influences the developmental pathways observed in RC development. Because the reader may not be familiar with the Arabic language, the authors first briefly describe the main characteristics and challenges of the Arabic orthography.

The Challenges of the Arabic Language

Several orthographic features of the Arabic language create certain difficulties in learning and teaching RC skills. First, Arabic script is written in a cursive fashion while each individual letter has multiple forms (at the beginning, middle, end or basic) according to its position within the word. Many letters, furthermore, have similar graphemes but their phonemes are completely different. The Arabic alphabet consists of twenty letters that have graphic similarity with at least one or two other letters (Brenznitz, 2004). Second, a greater influence of orthographic processing over-and-above phonological processing could be related to diglossia (the existence of a formal literary form of a language along with a colloquial form used by most speakers) in Arabic. Third, the glottal stop in Arabic, referred to as the Hamza, although a fully functioning consonant, is treated as a diacritical mark and has many different ways of writing depending on its position in the word resulting in various complex spelling and reading conventions (Elbeheri, Everatt, Mahfoudhi, Abu Al-Diyar, & Taibah, 2011). Fourth, the shaddah, one of the diacritics used with the Arabic alphabet, marks a long consonant. Shaddah is not a vowel but it indicates a place where the writing shows only one consonant, but the reader pronounces two consonants. Normally, this means that the reader has to hold or sustain the sound of that letter for twice as long. Fifth, the Arabic script consists of 17 basic character forms only, with dots placed above or below the various character forms making up the 28 letters of its alphabet. Dots are, therefore, extremely important and differ in their number (one, two or three) and in their position (below or above a character). Finally, word similarities, or the homograph phenomenon, may cause problems in the reading and spelling processes. Arabic is highly homographic in that words look similar orthographically but carry different meanings according to grammatical function or vowelization (Abu-Rabia, 1997).

The Context of the Study

In Jordan as well as other Arab countries, typical RC instruction consists of silent reading of a text followed by oral and written questions. When students could not find an answer to certain question, the teacher would ask them to read the text again with more concentration to find the answer. However, no specific RC strategies are given to the students. Generally, in the Arab world and especially in the Jordan, primary grade teachers teach all the subjects, including language. From the fourth grade on, each subject has its own teacher. Most of the elementary grades have four books for language, two for each semester: one for reading and the other for grammar. From both books, students learn reading, grammar, spelling, composition, and handwriting. Each book contains units that cover all the teaching weeks. Each unit has a title, a picture, a reading text in which new words are highlighted, a list of new words and their meanings, a series of reading comprehension questions, oral reading, word identification, vocabulary, grammar, spelling and dictation, speaking and composing exercises. In grades 1-3, the students learn to read and in grades 4-6, they read for comprehension. The books are readable and full of illustrations and colors. These books are designed by a special council in the Ministry of Education and revised by specialists and university professors.

Significance of the Study

According to the National Reading Panel (NRP, 2000), there are five specific practices that teachers should be using in their classrooms to help children become better readers: (a) phonemic awareness instruction, (b) explicit, systematic phonics instruction, (c) repeated oral reading practice with feedback and guidance, (d) direct and indirect vocabulary instruction, and (e) comprehension strategies instruction. Despite all this recent research interest, and despite the many reports advocating the importance of RC and its instruction, many teachers are still not sure about how to teach comprehension.

For example, Arabic language teachers in Jordan are always looking for more ideas and more concrete ways to improve their students' comprehension skills. Teachers ask questions such as "What is the best way to teach comprehension?" "Where can I find a research based comprehension program?" "What about my students who can read fluently but don't understand what they are reading?" "What can I do to support my struggling readers?".

In Arab countries very limited research exists that addresses the effective assessment and intervention practices for students who are severely deficient in reading or superior in reading (Al-Mannai & Everatt, 2005). The difficulty and complexity of the orthography of Arabic language may explain the need to validate new assessment measures (eg., CBM Maze) and RC instructions. This study facilitates the use of CBM Maze and Arabic RC instruction to enhance students' RC achievement. The results of this study can be used to help teachers provide better classroom practices for fostering RC skill among students with and without reading difficulties in Arab countries and around the world. To the authors' knowledge, no studies have been conducted to investigate the effect of comprehension strategies in Arabic RC using a standardize RC measure and CBM Maze.

Purposes of the Study

The purpose of this study was to investigate the effects of teaching RC instruction on students' RC achievement. On the other hand, students in the control group used the traditional way of teaching RC which relies heavily on questioning the students after reading silently selected text. Both groups progress were followed using the CBM Maze. Three main hypotheses were examined. First, there will be a significant difference in terms of the RC standardize test performance between students who used RC instruction compared to students in the control group. Second, there will be a significant difference in terms of the CBM Maze performance between students who used RC instruction compared to students who just remained in the traditional way of teaching comprehension. Finally, students with reading difficulties will develop a positive increase/trend-line in their CBM Maze skill as a result of providing RC instruction.

Method

Participants

A total sample of 66 fifth-grade students participated in the study. The researcher and school's principal coordinated to choose two comparable samples that were taught by the same teacher for the purpose of the study. Each one of the two samples was comprised of 32 students with average reading ability. Another two students with reading difficulties participated in the study as well. Jenna has an age of 127 months and Sami has an age of 128 months. The students with reading difficulties were identified and nominated by the resource room teachers to be participants in this study. In addition, the students with average reading ability must have an Arabic Grade Point Average (Arabic GPA) of 67 and above while an Arabic GPA of 66 and below was used as a cutoff point to include students with reading difficulties in the study. These students were enrolled in the second semester of 2011/2012 from a private school in the southern region of Jordan. In the school, curricular goals and objectives, materials, and Arabic instruction methods were similar. All classes were taught in Arabic. Students participated in a forty-minute Arabic language class five times a week. The school followed the standard Jordanian national curriculum. Most of the participants came from a middle socioeconomic status.

Consent forms were sent to parents seeking their permission for participation. Parents who agreed to let their children participate in the study were requested to complete a short questionnaire that addressed the inclusion criteria of this study. The participants were selected from a larger set of students who were assessed to meet the requirements for inclusion in the study: intelligence within the average range, native speakers of Arabic, no noted emotional or behavioral disorders, no noted attention disorders, and no sensory impairments. The data collection was completed by the authors, a trained teacher, and her assistant. This teacher has a degree in early childhood education and a diploma in learning disabilities. The sample's characteristics for the two groups or classes with regard to age and gender are presented in Table 1.

Table 1. The sample's characteristics

Group/Variable	Range of Age in Months	Mean Age	Gender	
			Female	Male
Group 1	125-131	127	16	16
Group 2	124-131	126	17	15

Note. n = 64 fifth-grade students.

Procedures

Children in the first condition or class received RC instruction and CBM Maze. Children in the second condition received CBM Maze and the traditional way of teaching comprehension which relies heavily on questioning the students about selected text. One of the students with reading difficulties was in the experimental group and the other one was in the control group. Children in the two conditions completed one pretest session and a posttests session 3 days after the training ended. The average time between pretest and posttest was 18 weeks for each of the groups. The first author provided the teacher and her assistant with 24 hours of professional development that focus mainly on the RC instruction for the purpose of this study. All testing were conducted by the classroom teacher, her assistant, and the second author.

Reading Comprehension Instruction

The participants in the experimental group received explicit teaching of the following RC strategies: (a) visualization or creating mental pictures of what they are reading; (b) making connections by activating prior knowledge; (c) asking questions before, during, and after reading; (d) making inferences and drawing conclusions during and after reading; (e) determining the main ideas or recurring themes in the text; (f) synthesizing information and; (g) using fix-up strategies when something doesn't make sense (Zimmerman & Hutchins, 2003, pp. 5-6). These strategies were provided four times a week for approximately 40 minutes for each session. Each class period included a brief review of the prior day's lesson, the strategies for the new day's lesson, and a brief summarization at the end of the class period. The focus was mainly on: (a) explicit teaching in which the teacher explains the comprehension strategy clearly, models the strategy, guides the students as they learn and apply the strategy, and provides practice with the strategy until students can apply it independently; (b) explicit teaching of how to use multiple strategies in combination; and (c) explicit teaching of how to apply strategies flexibly to different types of text (Carnine, Silbert, Kame'enui, & Tarver, 2004).

Treatment integrity

Treatment integrity checklists were used to measure the extent to which the teacher and her assistant implemented the intervention correctly. These checklists were based on the critical components of the selected intervention. Each step on the checklist was scored as completed or not completed, and the percentage of steps completed accurately was determined. A total of 40% of the 72 teaching lessons were randomly selected to examine the fidelity of the intervention. While the teacher implemented the intervention, an observer (the second author) independently and simultaneously conducted treatment integrity assessments. The average interobserver reliability was 98% (range 97%–100%). In addition, the team of this study had weekly updates and discussions to address the crucial points in the delivery of the intervention and provide feedback.

The CBM Maze

Translating the CBM Maze instructions into Arabic. The researcher used appropriate translation procedures (Brislin, 1986) prior to administer Arabic CBM Maze to a sample of Jordanian students. First, two native speakers of Arabic, who were also fluent in English, independently translated the CBM Maze instructions into Arabic. Second, a back translation of the Arabic version into English by a bilingual resident of the United States who is fluent in both English and Arabic languages was conducted. Third, all translators reached a reconciliation of the forward-backward translations. Finally, a pre-test was conducted with a convenience sample of 14 fifth-grade students to assess ease of comprehension, possible ambiguities, and alternative administration wording.

CBM Maze probes. The content of the probes were selected from several literature-based reading series used in the educational system in Jordan as supplementary materials to the accredited curriculum of fifth grade. All probes were partially vowelized just like the accredited curriculum that students are exposed to. Then a pool of probes was selected by the authors and Arabic curriculum specialist who works in the curriculum department in the Ministry of Education in Jordan. Each probe includes approximately 300 words. Researchers have tried to reduce variability in individual students' data due to passage difficulty by using readability formulas to measure text difficulty (Griffiths, VanDerHeyden, Skokut, & Lilles, 2009). In this study, we used the Spache formula to reduce the variance of the probes (Good & Kaminski, 2002). This formula considers difficulty of vocabulary and sentence length. In addition, all probes were given to three university's instructors and three teachers in the field to judge the difficulty of grammar and word order. Their suggestions were taken into consideration to make the final version of the probes. The procedure was identical to the one used with English CBM Maze probes.

To save set-up time and obtain a more accurate score, three equivalent probes of the Arabic CBM Maze materials were administered to the group of students in one testing session. The median score of these three probes were used to provide the basal data point on the student's performance. The authors counted the total number of responses attempted in three minutes and the total number of errors then subtracts the total number of errors from the total number attempted. Their performance is then based on the Words Correctly Restored (WCR) score (Hosp, Hosp, & Howell, 2007).

Pre- and Post-Testing

The Passage Comprehension Test from Woodcock-Johnson III Tests of Achievement–Arabic Adaptation (Abu-Hamour, 2013b; Woodcock, McGrew, & Mather, 2007; WJ III ACH) was used to assess RC ability of the participants. The Passage Comprehension items for fifth graders require the person to read a short passage and identify a missing key word that makes sense in the context of that passage. The items become increasingly difficult by increasing passage length, level of vocabulary, and complexity of syntactic and semantic cues. Passage Comprehension Test has a median reliability of .83 in the age 5 to 19 and .88 in the adult range.

Procedural and Inter-rater Reliabilities

To ensure consistency of testing administration across the CBM Maze probes and the Arabic WJ Passage Comprehension Test, the teacher read from scripts and used timers. The fidelity of testing administration was tested by using a detailed checklist to ensure each probe or Test was administered as it was intended and described in the manuals of the measures. Procedural reliability was obtained during 50% of the testing sessions with an average reliability of 100 percent. The teacher scored each CBM Maze probe or Passage Comprehension Test and entered the data into an excel sheet. The second author checked randomly 50% of the scoring sheets. The average inter-rater reliability of scoring fidelity data was 99% (range 98%-100%). In terms of data entry reliability, all of the excel data (100%) were checked against the paper scores and all discrepancies were resolved by examining the original protocols.

In order to respond to the research hypotheses, all data were entered into the Statistical Package for the Social Sciences (SPSS). In terms of statistical analyses, descriptive statistics and independent *t*-test were used to investigate the study's hypotheses.

Results

Descriptive statistics of the Arabic WJ Passage Comprehension Test scores are reported in Table 2 for the two groups of the study. These scores represent both pre and post intervention phases. The descriptive results indicated that the achievement of the experimental group (RC instruction) was greater than that of the control group (traditional way of teaching comprehension) by the end of the intervention.

Table 2. Means and standard deviations of the Arabic WJ Passage Comprehension Test

	Group 1		Group 2	
	M	SD	M	SD
Pre-Intervention	90.25	8.52	91.25	8.62
Post-Intervention	103.69	8.78	94.22	8.07

Note. n= 32 for each group, Group 1= RC instruction, Group 2= Traditional way of teaching comprehension, M= Mean, SD= Standard Deviation.

Groups' Comparisons

The Arabic WJ Passage Comprehension Test was administered to the students in the beginning of the semester to determine their RC skill and investigate the groups' differences. To assure that there were no violations of assumptions in independent *t*-test, a Levene's test was administered to the Arabic WJ Passage Comprehension Test scores for both groups. No violations of normality and homogeneity of variance were detected. The variances were equal for the experimental group and the control group, $F(1, 62) = .001$, $p = 0.978$, which is greater than 0.05. On the average, students in the control group had slightly higher scores ($M = 91.25$, $SD = 8.62$) than students in the experimental group ($M = 90.25$, $SD = 8.52$). However, this difference was not significant $t(62) = -.466$, $p = 0.643$, which is greater than 0.05.

To explore the group differences after applying the intervention, another independent *t*-test was executed. All assumptions of performing independent *t*-tests were examined. No violations of normality and homogeneity of variance were detected. The variances were equal for the experimental group and the control group, $F(1, 62) = .020$, $p = 0.887$, which is greater than 0.05. On average, students in the experimental group achieved higher scores in Arabic WJ Passage Comprehension Test ($M = 103.69$, $SD = 8.78$) than students in the control group ($M = 94.22$, $SD = 8.07$). This difference was significant $t(62) = -4.490$, $p < 0.001$, which is less than 0.05, and it represented a medium-sized effect $r = .49$. These results revealed that using the RC instruction significantly increased the RC achievement compared to just using the traditional way of teaching comprehension.

The same conclusion was yielded when other independent *t*-test and Levene's test were administered to the average median scores of the last three CBM Maze probes for the two groups. All assumptions of performing independent *t*-tests were examined. No violations of normality and homogeneity of variance were detected. The variances were equal for the experimental group and the control group, $F(1, 62) = .170$, $p = 0.682$, which is greater than 0.05. On average, students in the experimental group achieved higher scores in the CBM Maze probes ($M = 23.28$, $SD = 6.85$) than students in the control group ($M = 15.94$, $SD = 6.97$). This difference was significant $t(62) = -4.247$, $p < 0.001$, which is less than 0.05, and it represented a medium-sized effect $r = .47$.

The CBM Maze Performance and Growth Rate

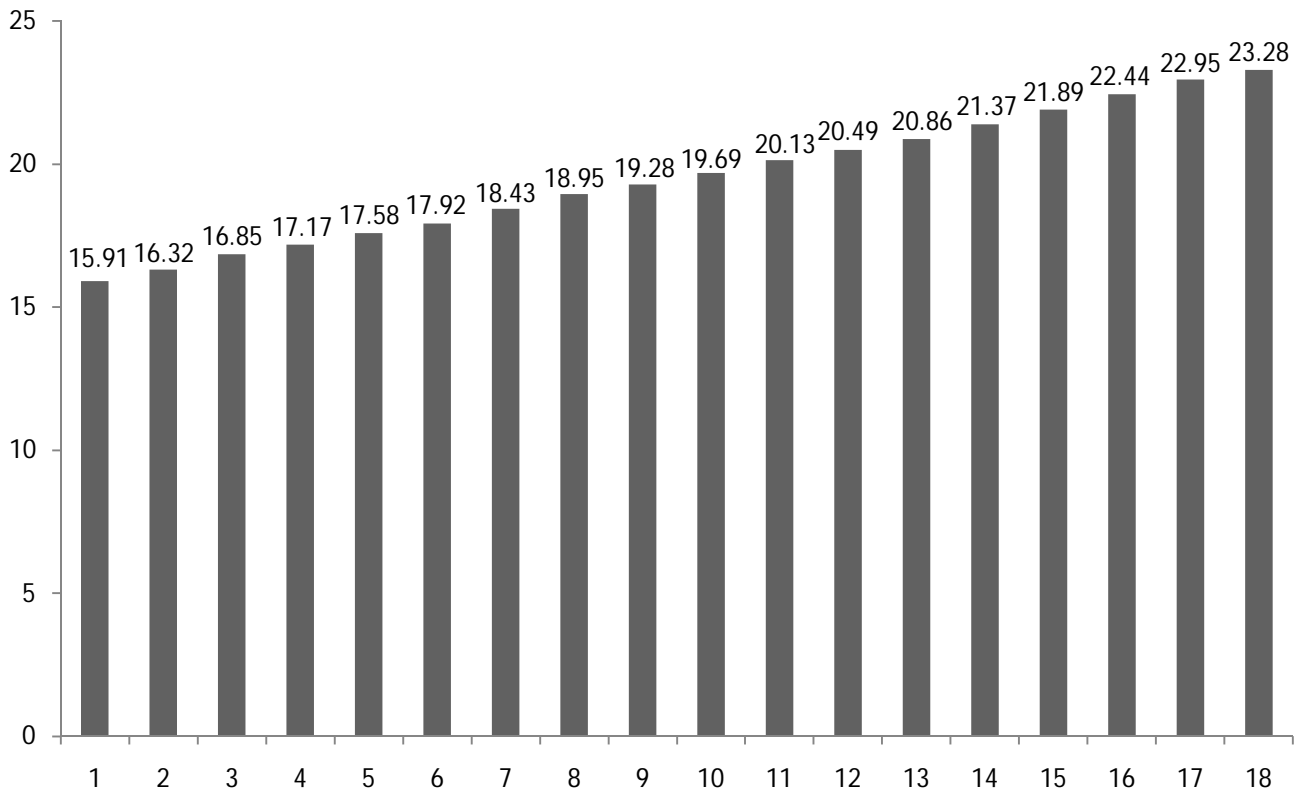
Table 3 presents the descriptive analysis including the means, standard deviations, and percentile ranks that represent the performance of the students in the two groups by the end of the academic semester. The contents of the table demonstrate that students' performance in CBM Maze was higher in the experimental group than that of the students in the control group.

Table 3. Descriptive information of CBM Maze performance by the end of the second semester in WCR in three minutes for the two study groups

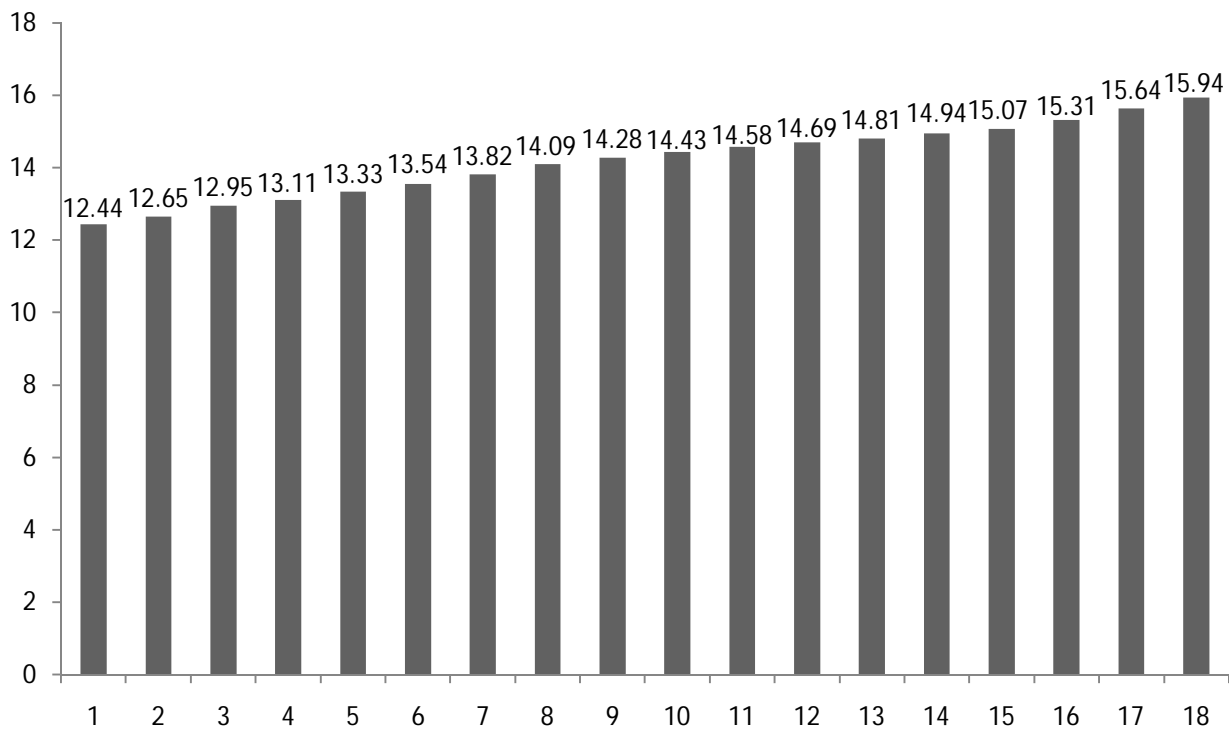
Group	Range	M	SD	Percentile	
Experimental Group	14-35	23.28	6.85	90%	34
				75%	29
				50%	21
				25%	18
				10%	14
Control Group	7-27	15.94	6.97	90%	25
				75%	22
				50%	16
				25%	12
				10%	7

Note. $n = 32$ for each group, CBM Maze = Curriculum Based Measurement Maze, WCR = Words Correctly Restored, M=Mean, SD=Standard Deviation.

Descriptive statistics also allowed providing visual graphs that facilitated more convenient presentation of the data. Graphs 1 and 2 display the average weekly performance of the two study groups. Students who received RC instruction progressed from 15.91 WCR on the first probe to 23.28 WCR by the last week of the semester. The estimated growth rate was .40 WCR per week. Students who received just the traditional way of teaching comprehension progressed from 12.44 WCR on the first probe to 15.94 WCR by the last week of the semester. The estimated growth rate was .19 WCR per week.



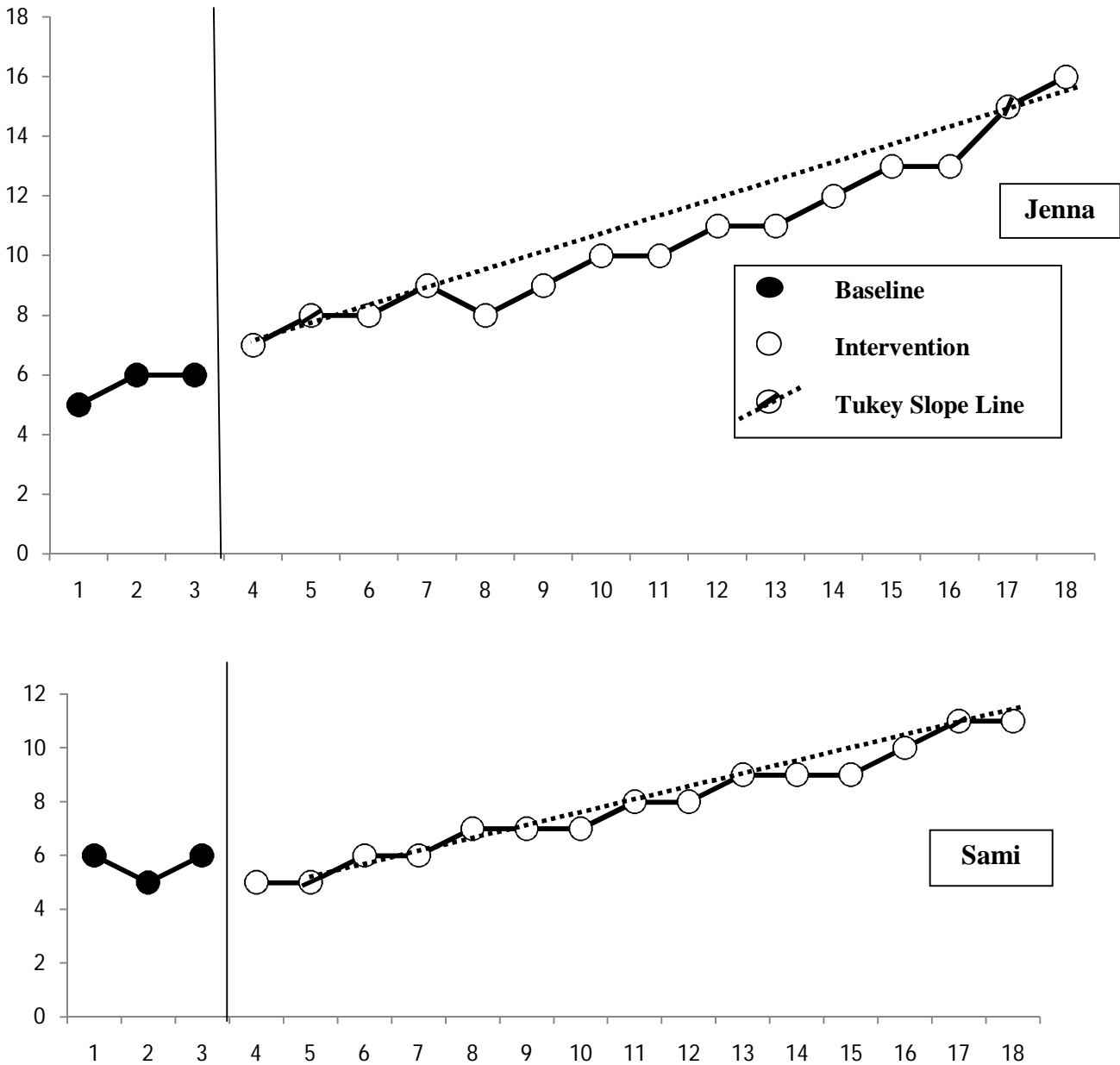
Graph 1. Graphic display of the weekly mean performance of CBM Maze reported in Words Correctly Restored for the RC instruction group.



Graph 2. Graphic display of the weekly mean performance of CBM Maze reported in Words Correctly Restored for the traditional way of teaching comprehension group.

The Growth Rate of Students with reading Difficulties

The two students with reading difficulties progressed on their CBM Maze scores. Jenna who received RC instruction progressed from 5 WCR on the base line probes to 16 WCR by the last week of the semester. On the other hand, Sami who received just the traditional way of teaching comprehension progressed from 5 WCR on the base line probes to 11 WCR by the last week of the semester. Even though these results are encouraging, these students are still extremely far behind their peers in literacy skills, and will require additional remedial intervention with progress monitoring to continue closing the gap. Graph 3 illustrates the students’ weekly CBM Maze progress.



Graph 3. Results of students with reading difficulties reported in Words Correctly Restored.

Social Validity

Evaluations of social validity focus on the satisfaction with the intervention’s outcomes by those who use the intervention. The participants completed a six-item questionnaire in a yes/no format following the completion of the study.

Specifically, the students were asked if they felt their reading comprehension skill improved during the CBM period and whether they enjoyed the instructional program. The first author read to the participants each item on the student questionnaire and asked them to color in a happy face for “yes” or a frowning face for “no.” Results indicated that students involved in this study were satisfied with the assessment process and the tutoring procedures. Approximately, 93% of the students believed that their RC skill improved because of the RC instruction and the use of CBM Maze. The teacher indicated that she liked the experience of teaching RC and administering CBM Maze.

Discussion

The main purpose of this study was to investigate the effect of RC instruction on RC achievement for the fifth-grade students in Jordan. The results indicated that students with average RC ability and students with reading difficulties achieved better performance when RC instruction was applied.

The Effects of RC Instruction on Students’ RC Achievement

To examine the effects of the RC instruction on students' RC achievement, two groups were participated in this study. The first group received RC instruction or strategies (See the methodology section for treatment description). The second group received traditional way of teaching RC which relies heavily on questioning the students after reading silently selected text. The results indicated that students in the treatment class outperformed students in the comparison class on the standardized RC measure and the CBM Maze progress. We interpret the findings from this study as suggestive that RC instruction is a feasible and effective practice that can be readily integrated into reading and language arts instruction with positive impact. We are encouraged about the potential effectiveness of this practice because the positive findings from this study resulted from treatment implementation conditions that are readily replicable. Findings from this study compare favorably with those from a recent study examining the effectiveness of several different comprehension programs with fifth-grade students (James-Burdumy et al., 2009). In addition, the findings supported other research and studies that state that the intentional teaching of reading strategies has a positive impact on the RC of average reader students and students with reading difficulties (Klingner et al., 2004; Schunk & Rice, 1992).

Furthermore, the results of this study indicated that the CBM Maze is an appropriate measure for monitoring students' academic growth in RC achievement. The fifth-grade students showed steady growth rate during the 18 weeks of intervention. Students in the experimental group presented better progress on CBM Maze than students in the control group. Although frequent probe taking is an essential component of CBM, it does not appear to be powerful enough on its own to enhance overall students' achievement (Stecker & Fuchs, 2000). Students involved in this study showed higher growth rate in the area of RC after they received instruction in how to use and apply the reading strategies.

CBM Maze and Students with Reading Difficulties

It is critical that all individuals who work with children understand the use of CBM Maze in the school setting as both a screening instrument that identifies risk levels associated with individual students and as a metric that monitors students' acquisition of RC skill. In this study, the results of two students with reading difficulties mirror the finding of students with average RC ability. Graph 3 showed that the student who received the RC instruction had better performance than the student in the control group. It seems that CBM Maze can be used repeatedly for purposes of progress monitoring of individual students who may require special education services (Fore, Burke, & Martin, 2006). This finding suggests that teachers need to ensure that students are given feedback on their progress on a regular basis when used CBM Maze. Students need to be aware that they are just as responsible for their learning as the teacher who is guiding them. If they feel they have ownership of their progress they might put forth extra effort into succeeding.

Limitations, Implications, and Future Research

This study has several limitations that should be considered. First, the sample size was relatively small and came from private schools. Thus, a replication of the study with a larger sample from public schools and across different grades would strengthen the conclusions. Second, since RC instruction is a multicomponent intervention, it is interesting to speculate about which of the components might be associated with impact and which components may be less influential.

The study does not address which components of RC instruction are associated with differential impact, but future research could experimentally manipulate and isolate the impact of various components determining their relative effects.

This study addressed the need to identify effective RC instruction, a challenge for many educators and practitioners. Hence, future research exploring the impact of new RC instructions is warranted. Effective RC intervention involves the teaching of RC strategies to help learners become more knowledgeable readers. The use of RC strategies should continue to be taught because there did seem to be a connection with increase in RC. Teachers need to make sure that children are familiar with all of the reading strategies and that they are given plenty of opportunities to use them. Some of the research pointed out that although it seems students understand the reading strategies, they do not transfer them to different genres of reading, and in many cases do not understand their importance in their reading success (Harvey & Goudvis, 2000). Researchers should investigate new ways of teaching RC in the Arab world. In addition, researchers and teachers in the Arab world should consider other valid and reliable assessment tools such as the use of CBM measures in both general and special education systems. Given the sophisticated orthographic issues of the Arabic language and the need to explore some Arabic language features, it is a necessity to investigate the use of new measures such as Arabic reading CBM for this purpose. Particularly important aspects of CBM for the use in Arabic speaking countries are the ease of administration, the low cost, and the reliability of the measurements.

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