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Reading Strategies and Reading Achievement in Middle School: Kazakhstani Young Learners

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Abstract

This study explores the reading strategies (RSs) of bilingual and monolingual young learners in their first and second languages (L1 and L2, respectively)—either Kazakh or Russian as the L1 and L2—and English as a foreign language (L3). It also examines the influence of RSs on the learners' performance on reading comprehension tests in the three languages. The test results showed significant differences in L1, L2, and L3.The results for reading achievement were generally poor but significantly different between the monolinguals and bilinguals. No significant gender differences were found in the reading test results or in the use of reading strategies while reading. However, the analysis indicated that although the probability of using other strategies while completing the tasks in L1, L2, and L3 was clear, more bilingual learners used advanced RSs than monolinguals. The findings on RSs provide an in-depth understanding of the differences between young, bilingual, and monolingual Kazakhstani learners in their use of RSs while reading in their respective languages. The results have significant implications for practice, suggesting placing more emphasis on developing reading strategies while learning how to read in the first and second languages.

Keywords

bilingual education, L1, L2, and EFL, middle school language learners, reading comprehension, reading skills, reading strategies

Introduction

Over the last few decades, researchers and educators (e.g., Lindholm & Tengberg, 2019; Sheorey & Mokhtari, 2001; L. Zhang, 2014, 2018) have started to focus on measuring reading comprehension among young adolescents in their first language (L1), second language (L2), and/or English as a foreign language (EFL) in bilingual and monolingual contexts. Researchers have concluded that successful bilingual readers use the same reading strategies in the native and target languages, whereas less successful ones cannot use "bilingual strategies" in reading appropriately (Riches & Genesee, 2006, p. 79). Skilful monolingual readers use more sophisticated reading strategies in their native language because they frequently apply a "monolingual pool of resources" in the reading process (Riches & Genesee, 2006, p. 80), whereas less proficient monolinguals cannot apply strategies in reading effectively. In the reading process, when the interaction of the "reader, the text, and the context" is being setup, the reader has to "utilize metacognitive knowledge and must invoke conscious and deliberate strategies" (Mokhtari & Sheorey, 2002, p. 3) to grasp meaning. Sheorey and Mokhtari (2001) have proposed that a reader's "metacognitive knowledge" involves reading strategies, which may benefit the cognitive process of reading.

Researchers (Flavell, 1979; Zimmerman & Schunk, 2011) state that the "metacognitive knowledge" of the reader should be sufficient and facilitate a successful learning process, albeit others (Mok et al., 2007) confirm that when young learners go to middle school, their "metacognitive knowledge" as regards reading decreases significantly. Additionally, researchers (Bae & Kwon, 2019; Martinez, 2006) point out that in order to increase "metacognitive knowledge" in the learning process, student–teacher interaction should be frequent, effective, and motivational. Hence, appropriate instruction, suitable intervention, and

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assessment are necessary for better academic achievement. Improvement of learners' reading skills demands development of effective reading strategies in the learning process. Thus, it is crucial to know and define what reading strategies the readers use and how they apply them in the reading process (Sheorey & Mokhtari, 2001). Consequently, assessment and observation of bilinguals and monolinguals in the classroom context may show us how to improve the teaching and learning process and achieve better reading comprehension in reading.

Reading Strategies in the Native and Foreign Languages

Reading strategies (RSs) are the tools necessary for comprehension in the reading process. RSs play a significant role in performing tasks in reading and achieving better comprehension. Reading strategies are among a number of substantial components of text comprehension, and adequate knowledge recognition necessary for successful "interpretation of the meanings communicated in the text" (Van Gelderen et al., 2004, p. 19). RSs are certain tactics that readers use while performing tasks in reading (Carrell, 1991; Pressley, 2000). Strategies in reading are essential in the process of reading the text to gain knowledge and facilitate comprehension (Mahdavi & Tensfeldt, 2013). Moreover, some researchers and educators assume that reading strategies are the "intentions of the reader," "skills under consideration," and "tools" (Afflerbach et al., 2008, p. 366; Paris et al., 1991, p. 611 as cited in Carrell, 1998, pp. 1, 2), which are necessary to achieve one's reading goals.

Strategies frequently used by bilinguals and monolinguals cannot be the same as and/or appropriate to each other because the two groups have different approaches in reading and learning their L1, their L2, and/or EFL (Riches & Genesee, 2006; Sheorey & Mokhtari, 2001). This happens because successful readers should primarily have solid literacy development in L1 for further reading progress in L2 and/or EFL (Riches & Genesee, 2006; Sheorey & Mokhtari, 2001). Consequently, skilful readers apply more sophisticated reading strategies than less skilled ones. While RSs are widely used by both proficient and non-proficient readers in the reading process, the variability, appropriateness, and frequency of RSs may relate to the reader's prior knowledge and experience and the usefulness of reading instruction (Mahdavi & Tensfeldt, 2013; Pressley, 2000).

Previous studies (Wang et al., 2009; Wen, 2003; D. Zhang et al., 2017) indicate that proficient readers use more sophisticated reading strategies in the reading process and in performing tasks in reading. The literature (Wen, 2003; D. Zhang et al., 2017) also maintains that skilful monolingual and bilingual readers use more reading strategies than struggling readers while reading a text in L1, L2, and/or EFL. However, a reader's ability level and language proficiency could also facilitate the usage, effectiveness, and frequency of reading strategies. Interestingly, mainly young learners reading in their L1 think that RSs will not change their reading skills at all, so they apply less effective RSs in their native language (i.e., L1) and, as a result, have little information about the text structure (Carrell, 1998; Paris et al., 1991). While in L2 and/or EFL, young learners' use of RSs depends on how they apply various RSs and "orchestrate" them strategically in a certain context for successful reading comprehension (Anderson, 1991; Carrell, 1998; Kern, 1997; L. Zhang, 2014). However, poor readers who have difficulty with reading comprehension cannot properly implement reading strategies in their L2 or in EFL and fail to understand meaning (Afflerbach et al., 2008).

Metacognitive Reading Awareness and Comprehension

Researchers (Afflerbach et al., 2007; Carrell, 1991; Pressley, 2000) point out that reading strategies are difficult to differentiate from other mental cognitive activities, such as thinking, problem-solving, and studying. Reading strategies that monitor the awareness of reading comprehension are called "conscious" awareness (Mokhtari et al., 2018; Sheorey & Mokhtari, 2001). Learner's background knowledge, gender, cognate vocabulary, language proficiency, and experience may influence this awareness.

Metacognitive reading awareness is defined as a strategy which is beneficial and useful for understanding the reading text (Mokhtari & Sheorey, 2002). Furthermore, this metacognitive awareness in reading is necessary to determine and monitor thinking skills in the learning process that may facilitate a reader's planning, self-evaluation, motivation, beliefs, suggestions, and desires (Mokhtari & Sheorey, 2002; Sheorey & Mokhtari, 2001). Sheorey and Mokhtari (2001) see "metacognitive knowledge" as thinking about thinking, which comes when the reader frequently uses several reading strategies. Pressley and Afflerbach (1995) indicate metacognitive reading awareness as the moment when the reader is able to receive a "constructively responsive" reading of the text. Thus, while reading the text, the reader should be able to obtain a certain metacognitive awareness, which may involve reading strategies and affective cognitive processes (Mokhtari & Sheorey, 2002). Consequently, this may prove that skilful and struggling readers should be assessed during the learning, instruction, and intervention processes. However, to master metacognitive reading awareness, the literature recommends frequent practice and experience of reading strategies and reading skills (Carrell, 1998; Mokhtari & Reichard, 2002, 2004).

The Present Study

Exploring reading strategies through learners' performance on reading tests in two cohorts in three languages (Kazakh, Russian, and English) will be useful to better facilitate and manage reading comprehension among young learners in the

future. Thus, our current study aims to examine young adolescents' reading strategies while doing the reading tests in the students' first and second languages (L1 and L2)—Kazakh or Russian—and EFL(L3) in bilingual and monolingual contexts. In particular, to define the frequency of reading strategies in this specific context, we aim to answer the following research questions:

(1) How well do young adolescents perform on each of the reading achievement tests with respect to their first language and gender?
(2) How often do young adolescents use reading strategies while reading in Kazakh, Russian, and English with respect to age and language?
(3) What is the gender difference in using reading strategies among bilinguals and monolinguals?
(4) What are the relationships between reading achievement and reading strategies across gender and age?
(5) To what extent do reading strategies affect the results of reading achievement among bilinguals and monolinguals?

Methods

Participants

The participants (N=1,563) were students in Grades 6 (N=888) and 8 (N=675) from randomly selected urban middle schools in Pavlodar (a city in the northeast of Kazakhstan with a population of 360,000). The students' ages ranged from 11 to 14 years. The mean for the ages was M=11.93 years (SD=.486) for Grade 6 and M=13.97 years (SD=.510) for Grade 8. The percentage of females was 52.6% and that of males was 47.4%; the ethnicity of the participants was Kazakh (N=986, 63%), Russian (N=547, 35%), and Other (N=30, 2%). Although Kazakhstan is culturally diverse, Kazakh and Russian are the two languages of instruction in most schools there (particularly in the northern parts of the country). The questionnaire was administered to the bilingual and monolingual students in Kazakh (N=609, 39%) and Russian (N=954, 61%).

Instruments

Background questionnaire. The background questionnaire involved questions where students were asked to supply information on their age, gender, grade, native language, and parents' highest level of education, which takes 3 to 5 minutes, before the participants completed the Metacognitive Awareness of Reading Strategies Inventory (MARSI) questionnaire.

The Metacognitive Awareness of Reading Strategies Inventory Questionnaire. The Metacognitive Awareness of Reading Strategies Inventory (MARSI), a 30-item questionnaire Version 1.0 developed by Mokhtari and Reichard (2002, 2004), was first used for young adolescents in middle school. The questionnaire uses a 5-point Likert scale and asks Kazakhstani young learners to define the frequency of the statements ranging from 1="never" to 5="always" when they read academic or school-related materials. Traditionally, MARSI explores the level of the metacognitive awareness of students from middle school who are able to use reading strategies for academic goals. The questionnaire reflects the development of the reading abilities of the students from ages 11 to 18 while reading texts for academic purposes. By using confirmatory factor analysis, the MARSI items were categorized into three factors; furthermore, several aspects of validity were examined (see Mokhtari et al., 2018, p. 223). The factors on the MARSI questionnaire are global strategies (13 items), problem-solving strategies (8 items), and support reading strategies (9 items).According to the researchers who developed MARSI, the instrument has been translated into a number of languages (Mokhtari et al., 2018, p. 221), albeit it has not been available in Russian or Kazakh. To adapt MARSI and provide an accurate level of comprehension and metacognitive awareness, a back translation was used, for which several language experts in English, Kazakh, and Russian languages were invited to translate the original version twice back and forth from English into Kazakh and from English into Russian.

This back translation process involved (1) two translators separately translating the source text into the target language (TL), then (2) sitting down and agreeing on a final TL translation. Then (3) a third translator translated that final TL translation back to the source language (SL)—not having seen the original TL text. Finally, (4) all three translators sat down and reviewed the faithfulness of the final TL translation to the original SL text by way of the third translator's "blind" SL translation.

The reading comprehension tests. For the reading comprehension tests in English, Kazakh, and Russian for Grades 6 and 8, we adapted the format of the tests used in the test battery developed by Hungarian language experts and researchers (for more details, see Csapó & Nikolov, 2009; Nikolov & Csapó, 2010, 2018). The modified version of the tests developed similar topics and tasks for all the target languages in both grades. All the rubrics on the tests were familiar to the students; the format and level of the tests corresponded to the A1 to A2 levels of The Common European Framework of Reference for Languages (Council of Europe, 2001). The reading tests were administered separately for the sixth and eighth grades, the reliability of all the tests in Grades 6 and 8 ranged from .94 to .96. Both the bilingual and monolingual students took the tests in three languages, Kazakh, Russian, and English, as Kazakh and Russian are used as the native language and/or the language of everyday communication in Kazakhstan and English is learned as a foreign language. Hence, each of these languages may be a novel (second or

Table 1. The Reading Tests in English, Kazakh, and Russian in Grade 6.

Skill	Task	Input content	No. of items
Reading 1 in English	Match the right answer to the questions	Invitation card	4
Reading 2 in English	Match words with the definition	Describing professions	8
Reading 3 in English	Choose the right word to the text	School website	8
Reading 1 in Kazakh	Match the right answer to the questions	Invitation card	4
Reading 2 in Kazakh	Match words with the definition	Defining words	8
Reading 3 in Kazakh	Match the right answer to the question	Weather forecast table	8
Reading 1 in Russian	Match the right answer to the questions	Poster information	4
Reading 2 in Russian	Match notices with the meaning	Describing notices	8
Reading 3 in Russian	Match the right answer to the question	Weather forecast map	8

Table 2. The Reading Tests in English, Kazakh, and Russian in Grade 8.

Skill	Task	Input content	No. of items
Reading 1 in English	Match true or false statement	Advertisement information	7
Reading 2 in English	Match words with the definition	Defining words	10
Reading 3 in English	Match advertisements with missing words	Advertisements	9
Reading 1 in Kazakh	Match true or false statement	Advertisement information	7
Reading 2 in Kazakh	Match the question to the meaning	Definitions	10
Reading 3 in Kazakh	Match the right answer to the question	Library working hours table	9
Reading 1 in Russian	Match the question to the answer	Dialogue interview	7
Reading 2 in Russian	Match true or false statement	Advertisement information	7
Reading 3 in Russian	Match the right answer to the question	Museum working hours table	12

third) language to a certain group, which may also cause different kinds of difficulties while using reading strategies in these languages. The number of items on the tests for the sixth and eighth grades is represented in Tables 1 and 2.

Descriptive statistics and reliabilities of the instruments. Cronbach's alpha showed good reliability on all the reading tests in the target languages ranging from $\alpha = .95$ in the sixth grade to $\alpha = .96$ in the eighth grade. On the questionnaire, alpha was $\alpha = .88$ in the sixth grade and $\alpha = .90$ in the eighth grade, although the reliability of the questionnaire for the total sample ($N = 1{,}563$) was good ($\alpha = .89$). However, the original version of the MARSI alpha coefficient for all the items was $\alpha = .93$ (see Mokhtari & Reichard, 2002 as cited in Lindholm & Tengberg, 2019, p. 13). Nevertheless, the alpha for the subscales was as follows: $\alpha = .86$ for global reading strategy, $\alpha = .80$ for problem-solving strategy, and $\alpha = .81$ for support reading strategy. The present study showed the range of alpha: for factor 1—global reading strategies ($\alpha = .78$); for factor 2—problem-solving strategies ($\alpha = .68$); and for factor 3—support reading strategies ($\alpha = .74$). Cronbach's alpha for reading comprehension and reading strategies indicated an increased value in the higher grade (Table 3).

Data collection was conducted in January to February, 2020, among young adolescents from seven randomly selected middle schools. The assessment survey involved two parts. In the first part, the students answered some background questions (such as gender, age, grade, and mother tongue) and then completed the MARSI questionnaire in the language they had chosen (Kazakh or Russian). Then, in the second part, the students took the reading comprehension tests in Kazakh, Russian, and English. The required instruments were administered via the online eDia (Electronic Diagnostic Assessment System) platform (Csapó & Molnár, 2019).All the participants were informed of the purpose of the research before the assessment, although those who had questions during the survey were assisted. The students were instructed to read each statement carefully and attentively and choose the response that applies to them when they read books related to their studies and/or school program.

Procedure

The survey process took place in morning and afternoon sessions because many schools in Pavlodar have two shifts. Thus, for some grades, school begins at 8.00 a.m. and for others at 2.00 p.m. However, we managed to arrange lessons in the morning and afternoon sessions at each school, and the survey process commenced in 2018. An agreement with the Departments of Education in the region and the city as well as with principals, administrators, and teachers in the randomized schools had been reached the year before. The students completed the questionnaire and the tests in both

Table 3. Descriptive Statistics.

	Grade 6 ($n=888$)				Grade 8 ($n=675$)			
Variable	No. of items	α	*M* (%)	*SD* (%)	No. of items	α	*M* (%)	*SD* (%)
Reading comprehension	60	.945	50.00	23.57	78	.957	50.00	23.95
English reading	20	.841	33.00	21.70	26	.898	41.00	24.54
Kazakh reading	20	.925	52.00	31.14	26	.919	50.00	27.91
Russian reading	20	.919	54.00	29.52	26	.938	56.00	30.52
Overall (MARSI)	30	.879	50.00	28.88	30	.901	50.00	28.89
Factor 1 (GLOB)	13	.754	50.00	28.84	13	.800	50.00	28.85
Factor 2 (PROB)	8	.638	50.00	28.80	8	.716	50.00	28.81
Factor 3 (SUP)	9	.726	50.00	28.82	9	.754	50.00	28.83

Note. Factor 1 = global reading strategies; Factor 2 = problem-solving strategies; Factor 3 = support reading strategies.

Table 4. Reading Comprehension: Grade 6.

	Kazakh ($n=347$)		Russian ($n=541$)			
	M (%)	*SD* (%)	*M* (%)	*SD* (%)	*t*-Value	*p*-Value
Reading comprehension	46.21	22.22	46.01	22.71	0.127	ns.
English reading	32.00	21.20	33.00	22.00	−0.990	ns.
Kazakh reading	53.00	30.70	51.00	31.40	0.873	ns.
Russian reading	54.00	29.00	53.00	29.70	0.098	ns.

grades in about 40 to 60 minutes. The internet connection in the computer labs was good, so the students had no difficulties during their measurement process. Data were analyzed with SPSS and Mplus statistical software.

Results

The Learners' Reading Comprehension Development and Differences

The first part of our research question examined the mean differences of the whole sample from the English, Kazakh, and Russian reading tests. Although the students demonstrated moderate achievement on all of the three reading tests ($M=50\%$, $SD=28.8\%$), we compared the differences between the three reading tests with a paired sample *t*-test. The score for the whole sample on each test showed low achievement in English ($M=36\%$, $SD=23.3\%$), Kazakh ($M=51\%$, $SD=29.8\%$), and Russian ($M=55\%$, $SD=29.9\%$). The results for the paired *t*-test between English ($M=36\%$, $SD=23.3\%$) and Kazakh ($M=51\%$, $SD=29.8\%$) demonstrated statistically significant differences ($t(1,562)=-20.402$, $p<.001$). The differences between Kazakh ($M=51\%$, $SD=29.8\%$) and Russian ($M=55\%$, $SD=29.9\%$; $t(1,562)=-5.735$, $p<.001$) and between Russian ($M=55\%$, $SD=29.9\%$) and English ($M=36\%$, $SD=23.3\%$; $t(1,562)=-26.178$, $p<.001$) were also significant. The effect size (Cohen's *d*) was medium ($d=0.560$) from English to Kazakh, small ($d=0.134$) from Kazakh to Russian, and large ($d=0.708$) from Russian to English (Cohen, 1988).

Further, we examined reading comprehension differences with regard to the learners' background language and gender. The independent sample *t*-test in the sixth grade showed no significant differences as regards the learners' L1 (see Table 4), whereas in the eighth grade the difference between the Kazakhs and Russians was significant ($t(673)=-31.256$, $p<.001$; Table5). Interestingly, the results for the whole sample in reading comprehension demonstrated statistically significant differences ($t(1,561)=-14.044$, $p<.001$; Table 6), with the Russians performing better than the Kazakhs on all the reading comprehension tests ($p<.001$).

Gender difference in reading achievement was investigated by independent *t*-test. The findings of the analysis showed that the boys performed significantly better than the girls on the Russian reading test. However, on the English and Kazakh reading tests, gender differences were insignificant ($p>.05$; Table 7). Even with the significant difference between boys and girls on the Russian reading test, the effect size of gender was very small on all the reading tests, that is, English ($d=0.001$), Kazakh ($d=0.075$), and Russian ($d=0.174$), according to Cohen (1988).

Frequency of Reading Strategies With Regard to Age and Language

The adapted MARSI questionnaire was used for the first time with young adolescents aged 12 and 14 (sixth and eighth graders) in Kazakhstan. The MARSI questionnaire was mainly designed "to assess 6th- through 12th-grade

Table 5. Reading Comprehension: Grade 8.

	Kazakh ($n = 262$)		Russian ($n = 413$)			
	M (%)	*SD* (%)	*M* (%)	*SD* (%)	*t*-Value	*p*-Value
Reading comprehension	26.73	11.34	63.21	16.59	−31.256	.000
English reading	27.00	16.90	49.00	24.70	−12.667	.000
Kazakh reading	30.00	19.30	62.00	25.40	−17.223	.000
Russian reading	22.00	11.60	78.00	14.90	−51.519	.000

Table 6. Reading Comprehension for the Whole Sample (Grades 6 and 8).

	Kazakh ($n = 609$)		Russian ($n = 954$)			
	M (%)	*SD* (%)	*M* (%)	*SD* (%)	*t*-Value	*p*-Value
Reading comprehension	37.81	20.70	53.47	22.00	−14.044	.000
English reading	30.00	19.60	40.00	24.50	−8.826	.000
Kazakh reading	43.00	28.60	56.00	29.50	−8.372	.000
Russian reading	40.00	27.90	64.00	27.30	−16.756	.000

students' awareness and perceived use of reading strategies while reading academic or school-related materials" (Mokhtari & Reichard, 2002, p. 251). On MARSI, researchers (Mokhtari & Reichard, 2002) have indicated the ranges for high (3.5 and higher), medium (2.5–3.4), and low (2.4 and below) scores for using reading strategies while reading academic texts. Due to the young age of the students and their low proficiency in English, the MARSI questionnaire was completed in the students' native language (Kazakh or Russian), not in English.

The independent sample *t*-test was conducted to find differences on the 30-item MARSI reading strategy questionnaire with three factors according to the students' age. The results showed (see Table 8) significant differences among the eighth-grade students for factor 1 ($t(673) = -3.892$, $p < .001$) and for factor 2 ($t(673) = -3.313$, $p < .001$). However, the frequency of using support reading strategies was not statistically significant while reading school materials.

The MARSI questionnaire in Kazakh and Russian and the reading tests in the target languages were measured in the analysis of the whole sample: both Grades 6 and 8 ($N = 1{,}563$) combined. As MARSI covers three factors with the three levels of reading strategy use that have already been validated, the average for the factors in our current study yielded a medium score ($M = 2.61$, $SD = .462$) for the strategies used in reading academic or school-related materials (see Table 8). The overall score for students who completed the questionnaire in Kazakh demonstrated a statistically significant difference of using more reading strategies in reading than those who did so in Russian ($t(1561) = 8.240$, $p < .001$; see Table 9).

Analysis showed that there were significant differences between the students. Those whose native language was Kazakh applied more reading strategies while reading the text than those whose native language was Russian. It seemed that the bilingual (Kazakh) students used reading strategies more frequently than the monolinguals (Russian; Alsheikh & Mokhtari, 2011; Sheorey & Mokhtari, 2001).

Gender Differences in Use of Reading Strategies Among the Bilinguals and Monolinguals

Gender differences among the bilingual and monolingual students in both grades showed no statistical differences in the use of reading strategies on the MARSI test overall. However, the girls performed significantly better on some items related to problem-solving and support strategies. The results of the independent *t*-test demonstrated no significant gender-related differences in the use of reading strategies while reading ($t(1561) = -.1.525$, $p > .05$) on the overall MARSI mean score and each of the three MARSI strategies (see Table 10). As regards interpretation of the MARSI scores (Mokhtari & Reichard, 2002), boys and girls in Kazakhstan are at the medium level for the use of these strategies in reading.

Global reading strategies ("I decide what to read closely and what to ignore. I use tables, figures, and pictures in text to increase my understanding.") and one item for support reading strategy ("I use reference materials such as dictionaries to help me understand what I read.") indicated low average scores compared to other items on the MARSI questionnaire (see Supplemental Appendix A, items 14, 15, and 17). Given the means for these subscale strategies, we may assume that decision-making and/or proper use of figures and tables in reading comprehension have not been constantly formed so far among young adolescents in Kazakhstan.

Relationships Between Reading Achievement and Reading Strategies Across Gender and Age

All the relations between the reading test results and reading strategies were negative for the girls, albeit significantly

Table 7. Reading Comprehension by Gender (Whole Sample for Grades 6 and 8).

	Boys ($n = 741$)		Girls ($n = 822$)			
	M (%)	*SD* (%)	*M* (%)	*SD* (%)	*t*-Value	*p*-Value
Reading comprehension	51.25	23.47	48.87	23.92	1.983	.047
English reading	49.98	28.76	50.01	28.87	−0.020	n.s.
Kazakh reading	51.14	29.08	48.97	28.58	1.489	n.s.
Russian reading	52.63	28.56	47.63	28.87	3.438	.001

Table 8. Grade Differences in Reading Strategies (Grades 6 and 8).

	Grade 6 ($n = 888$)		Grade 8 ($n = 675$)			
	M	*SD*	*M*	*SD*	*t*-Value	*p*-Value
Overall (MARSI)	2.61	0.462	2.69	0.487	−3.128	.002
Factor 1	2.56	0.489	2.66	0.519	−3.892	.000
Factor 2	2.71	0.511	2.80	0.544	−3.313	.001
Factor 3	2.58	0.558	2.62	0.569	−1.320	ns.

Note. Factor 1 = global reading strategies; Factor 2 = problem-solving strategies; Factor 3 = support reading strategies.

Table 9. Reading Strategies Used by Kazakhs and Russians (Grades 6 and 8).

	Kazakh ($n = 609$)		Russian ($n = 954$)			
	M	*SD*	*M*	*SD*	*t*-Value	*p*-Value
Overall (MARSI)	2.77	0.436	2.57	0.481	8.240	.000
Factor 1 (GLOB)	2.74	0.457	2.51	0.512	9.276	.000
Factor 2 (PROB)	2.81	0.491	2.71	0.545	3.808	.000
Factor 3 (SUP)	2.75	0.497	2.50	0.580	8.958	.000

Note. Factor 1 = global reading strategies; Factor 2 = problem-solving strategies; Factor 3 = support reading strategies.

Table 10. Differences by Gender for the Whole Sample (Grades 6 and 8, 2020).

	Boys ($n = 741$)		Girls ($n = 822$)			
Reading Strategy	*M*	*SD*	*M*	*SD*	*t*-Value	*p*-Value
GLOB	2.59	0.526	2.60	0.485	−.457	.648
PROB	2.72	0.545	2.77	0.509	−1.840	.066
SUP	2.57	0.580	2.62	0.547	−1.722	.085
Overall MARSI	2.63	0.493	2.66	0.456	−1.525	.128

moderate for global strategies on all the English (−.110**), Kazakh (−.102**), and Russian (−.133**) tests and for support strategies only on the Kazakh (−.088*) and Russian (−.127**) tests. For the boys, significantly negative correlations were found in Russian between the global strategies (−.100**) and support strategies (−.112**). However, it is interesting that the relationship between problem-solving strategies and reading test results in English was significantly positive (.074*) for the boys only (see Table 11).

Moreover, a correlation analysis showed mostly weak and negative relationships between reading strategies and reading comprehension tests in both grades (see Table 12). The results for the whole sample showed significantly negative relationships between reading achievement tests and the use of reading strategies, which may suggest that proper instruction is not provided and/or the level of reading skills is not frequently practiced (see Table13).

The Impact of Reading Strategies on Reading Comprehension Tests Among the Bilinguals and Monolinguals

Furthermore, multiple regression analysis was conducted between the bilingual and monolingual students for using

reading strategies as predictor variables and performance in L1, L2, and EFL reading as a dependent variable, as well as the influence of each language on themselves. The measurement was analyzed separately among the students in the sixth and eighth grades in order to examine the impact of reading strategies and reading comprehension among bilinguals and monolinguals. However, the percentage in both grades was taken into account as regards their first/native language (Kazakh or Russian; Table 14).

In both grades, the prediction of reading strategies used by bilinguals was 25% (R^2 = .245) in L1/Kazakh, 36% (R^2 = .363) in L2/Russian, and only 17% (R^2 = .165) in L3/English.

The Russian monolinguals predicted almost the same percentage in all the target languages: 36% (R^2 = .359) in L1/Russian, 36% (R^2 = .363) in L2/Kazakh, and 37% (R^2 = .371) in L3/English.

Interestingly, the predictions of reading strategies used by students in Grade 8 in Kazakh and Russian were significantly higher than of the students in Grade 6. However, in the prediction of reading strategies used by the sixth graders in L3/EFL was better than of the eighth graders (see Tables 14 and 15).

Table 11. Correlation Between Reading Achievement and Reading Strategies by Gender.

	Factor 1 (GLOB)	Factor 2 (PROB)	Factor 3 (SUP)	MARSI
Boys (N = 741)				
Test in English	.005	.074*	.040	.045
Test in Kazakh	−.010	.024	−.044	−.012
Test in Russian	−.100**	−.034	−.112**	−.092*
Girls (N = 822)				
Test in English	−.110**	−.036	−.048	−.071*
Test in Kazakh	−.102**	−.022	−.088*	−.079*
Test in Russian	−.133**	−.053	−.127**	−.118**

Note. Factor 1 = global reading strategies; Factor 2 = problem-solving strategies; Factor 3 = support reading strategies.
*p < .05. **p < .01.

Confirmatory factor analysis of reading strategies among the learners. To test the original factors defined on the MARSI questionnaire, which consisted of 30 items and three factors, that is, global reading strategies (GLOB), problem-solving strategies (PROB), and support reading strategies (SUP), from the total sample (N = 1,563), a confirmatory factor analysis (CFA) was conducted using Mplus computer software. As the hypothesized factor model was supported theoretically in respect of the number of factors on the validated MARSI questionnaire, exploratory factor analysis (EFA) was omitted (L. Zhang, 2018, p. 14) and CFA was examined to test the model fit in each sixth- and eighth-grade student separately and then combined for the whole sample.

Confirmatory factor analysis with three-factor loadings in Grade 6 showed a poor statistical fit for the data, with the following results for the indices: three-factor loadings—χ^2 = 1,146.642, CFI = 0.85, TLI = 0.84, df = 402, RMSEA = 0.04, SRMR = 0.04. In Grade 8, the model fit indices indicated a weak degree: three-factor loadings—χ^2 = 1,326.075, CFI = 0.81, TLI = 0.80, df = 402, RMSEA = 0.05, SRMR = 0.05. The results in three-factor loadings of the whole sample in the sixth and eighth grades were fragile; the model indices did not fit the data (χ^2 = 1,886.750, CFI = 0.85, TLI = 0.83, df = 402, RMSEA = 0.05, SRMR = 0.04). The standardized factor loadings and correlation between the factors in both grades are represented in Figure 1.

As the measurement model in CFA was poorly fitted to the data, we calculated convergent and discriminant validities, composite reliability (CR), and average variance extracted (AVE). Based on the CFA output (Figure 1), we first tested the CR and AVE of the items for each construct. AVE is computed by $\Sigma\lambda^2/n$, where n is the number of items in the construct and λ-factor loading, and CR is calculated by $(\Sigma\lambda)^2/(\Sigma\lambda)^2 + (\Sigma\varepsilon)$.

Table 16 shows the reliability and validity of the factors on MARSI. The recommended value for the composite

Table 12. Correlations for Reading Skills in English, Kazakh, and Russian and Metacognitive Reading Strategies Across Grades 6 and 8.

Year	Task	Kazakh reading	Russian reading	Factor 1 (GLOB)	Factor 2 (PROB)	Factor 3 (SUP)
Grade 6 (N = 888)	English reading	.463**	.466**	−.089**	−.086*	−.082*
	Kazakh reading		.581**	−.093**	−.085*	−.120**
	Russian reading			−.139**	−.085*	−.169**
	Factor 1(GLOB)				.678**	.720**
	Factor 2 (PROB)					.654**
Grade 8 (N = 675)	English reading	.465**	.477**	−.097**	−.052*	−.071**
	Kazakh reading		.608**	−.135**	−.069**	−.151**
	Russian reading			−.215**	−.114**	−.235**
	Factor 1(GLOB)				.684**	.747**
	Factor 2 (PROB)					.650**

Note. Factor 1 = global reading strategies; Factor 2 = problem-solving strategies; Factor 3 = support reading strategies.
*p < .05. **p < .01.

reliability is .60 or higher, and for the AVE the value should be greater than .50 (Fornell & Larcker, 1981). CR met the reliability criterion for the factors, whereas AVE did not. Convergent validity was tested with the SPSS correlation matrix approach, where all the correlations between the items were significant and greater than zero, thus suggesting that convergent validity between the constructs obtains. The range between the item correlations should be between .30 and .70.

In order to check discriminant validity, we used the SPSS correlation matrix approach and checked the extent to which the items for one factor are truly different from those for another factor. Theoretically, the violation of discriminant validity should be lower than that of AVE (Fornell & Larcker, 1981; Hair et al., 1992). In our study, discriminant validity did not obtain, as the correlation between the items was greater than it was for AVE.

In order to restructure CFA output model, we deleted several items with low factor loading of less than .50 (Schumacker & Lomax, 2010). Although the model fit improved ($\chi^2 = 394.047$, CFI = 0.92, TLI = 0.90, $df = 63$, RMSEA = 0.05, SRMR = 0.04) after omitting several items, there was no discriminant validity.

Discussion

The Kazakh bilinguals achieved poor scores on all three tests, and the analysis showed a significant difference between the bilingual and monolingual readers, with the monolinguals outperforming the bilinguals on the three tests. However, the total reading comprehension score of the samples were generally low but satisfactory. Another explanation for the differences in the results between the bilingual and monolingual students could be that the monolinguals achieved the threshold level in their heritage language and were able to transfer their L1 skills to their novel L2 and L3 languages, whereas the bilinguals had still not achieved threshold level skills in their native or L1 language.

The study shows no significant gender differences in taking the tests in the three languages and applying RSs in reading school materials. However, the girls seemed to use RSs more frequently in reading, as only two problem-solving statements and two support RS statements were statistically significant. Although the overall score on MARSI was insignificant. This is consistent with some studies (e.g., Poole, 2010; Yeung & Conley, 2008 as cited in Elliott et al., 2010, p. 95) that have found that girls usually perform statistically better than boys do. Nevertheless, other studies have also indicated that there is no gender difference in reading achievement because the gender variable is changeable (Elliott et al., 2010; Zhan, 2006), yet the assumption that girls and boys use different RSs is also possible (Mokhtari & Reichard, 2002; Sheorey & Mokhtari, 2001). For instance, Bouchamma et al. (2014) found that the RSs that enhance boys' reading comprehension are using previous knowledge and comparing that knowledge to the present information, as well as making use of charts, messages, and graphs.

The fact that the MARSI questionnaire was administered in Kazakh and Russian—but not in English—may explain the significantly weak relation found in reading comprehension among students from both grades. Various studies have also found that when students are reading or performing tasks in EFL, they tend to apply the same strategies from their native languages, such as their prior knowledge or translate the text for better comprehension (Alsheikh & Mokhtari, 2011, p. 152; Kong, 2006). Therefore, it can be assumed that these young learners used the same RSs that they usually do in either Kazakh or Russian or both while performing reading tasks in English (Riches & Genesee, 2006).

Most researchers (Alsheikh & Mokhtari, 2011; Lau & Chan, 2003) have found a positive relationship between reading strategies and reading comprehension, which means how skilful the reader is in using appropriate and sophisticated reading strategies in reading. However, Kennedy and Park (1994), as cited in Riches and Genesee (2006, p. 68), reported that students who speak languages other than English at home usually have a negative correlation with reading when completing standardized tests in school and that students of Asian heritage tend to have significant negative impact links compared with those from other language backgrounds. Hence, it seems that there is a need for appropriate instruction on reading strategies in teaching and learning respected languages for students.

The strong correlation between Kazakh and Russian in reading comprehension may be explained by the Cyrillic alphabet and shallow orthographies in these languages. The usage of reading strategies among bilingual and monolingual students also depends on the level of reading abilities (i.e., whether they are skilful or unskilful readers). Moreover, some researchers and educators (Mokhtari & Reichard, 2002; Poole, 2010) state that proficient readers use problem-solving strategies more frequently than global and support strategies. However, others (L. Zhang & Wu, 2009) point out that more proficient readers prefer to use more problem-solving and global strategies, whereas less proficient ones have been found to apply more support strategies. Nevertheless, there may also be several other additional individual strategies during the reading process, which the reader may frequently use. The overall score for reading strategies showed that Kazakhstani students in middle school had a medium level of reading strategy use($M = 2.65$, $SD = .474$) while reading in their native language—Kazakh and/or Russian—as the questionnaire was in Kazakh and Russian (i.e., the students' language of instruction at school).

RSs are essential in defining the use of cognitive and motivational processes as well as in facilitating improvements in language and reading awareness for "struggling readers" (Mokhtari & Reichard, 2002, p. 250). Most studies state that students who are fluent in their L1 but poor in their L2 or EFL can use more effective RSs than those who are

Table 13. Correlations for the English, Kazakh, and Russian Reading Tests and Metacognitive Reading Strategies (All Samples, $N = 1{,}562$).

	Kazakh reading	Russian reading	Factor 1 (GLOB)	Factor 2 (PROB)	Factor 3 (SUP)
English reading	.465**	.477**	−.097**	−.052*	−.071**
Kazakh reading		.608**	−.135**	−.069**	−.151**
Russian reading			−.215**	−.114**	−.235**
Factor 1 (GLOB)				.684**	.747**
Factor 2 (PROB)					.650**

Note. Factor 1 = global reading strategies; Factor 2 = problem-solving strategies; Factor 3 = support reading strategies.
*$p < .05$. **$p < .01$.

Table 14. Multiple Regressions for Grade 6 in English, Kazakh, and Russian.

	English reading L3									
	Kazakh/bilingual ($n = 347$)					Russian/monolingual ($n = 541$)				
Independent variable	*r*	β	*r**β	*t*	*p*	*r*	β	*r**β	*t*	*p*
Kazakh reading	.182**	.131	.024	2.487	.013	.402**	.343	.138	8.739	.000
Russian reading	.235**	.217	.051	4.103	.000	.329**	.247	.081	6.287	.000
Factor 1	−.065	.027	−.002	.315	.753	−.008	−.022	.000	.557	−.025
Factor 2	−.131*	−.209	.027	−3.054	.002	−.033	.006	−.000	.881	.006
Factor 3	−.027	.148	−.004	2.034	.043	−.029	.005	−.000	.120	.005
R^2			**.108**					**.219**		
	Kazakh reading L1/L2									
	Kazakh/bilingual ($n = 347$)					Russian/monolingual ($n = 541$)				
Independent variable	*r*	β	*r**β	*t*	*p*	*r*	β	*r**β	*t*	*p*
Russian reading	.205**	.172	.035	3.203	.001	.239**	.363	.087	8.739	.000
English reading	.182**	.141	.026	2.628	.009	.402**	.120	.048	2.883	.004
Factor 1	−.045	−.018	.001	−.346	.730	.015	.014	.000	.344	.731
Factor 2	−.061	−.040	.002	−.751	.453	−.074	−.056	.004	−1.439	.151
Factor 3	−.047	−.018	.001	−.340	.734	−.043	−.023	.001	−.578	.563
R^2			**.065**					**.140**		
	Russian reading L2/L1									
	Kazakh/bilingual ($n = 347$)					Russian/monolingual ($n = 541$)				
Independent variable	*r*	β	*r**β	*t*	*p*	*r*	β	*r**β	*t*	*p*
Kazakh reading	.205**	.164	.034	3.177	.002	.239**	.127	.030	2.883	.004
English reading	.235**	.221	.052	4.228	.000	.329**	.277	.091	6.287	.000
Factor 1	−.096	−.062	.006	−.744	.457	.041	.299	.012	1.039	.299
Factor 2	−.025	.172	.004	2.567	.011	−.070	.186	.013	−1.324	.186
Factor 3	−.150**	−.246	.037	−3.712	.000	−.062	.242	.015	−1.172	.242
R^2			**.133**					**.161**		

Note. Factor 1 = global reading strategies; Factor 2 = problem-solving strategies; Factor 3 = support reading strategies.
The total variance explaining the impact of bilinguals and monolinguals are figures in bold. Figures are significant at **$p < .01$. *$p < .05$.

not fluent in their L1, L2, or EFL, or all three (Jiménez, 2000; Riches & Genesee, 2006; L. Zhang et al., 2014). Further, students who have developed in their L1 are able to transfer their reading skills to the target language (L2 and/or EFL), whereas those who are poor in their L1 are not.

However, factors such as young language learners' prior knowledge, parents' role in education, qualitative human resources, and the genre of the text are significantly important for the effective use of RSs in the reading process. In addition, the quality of the technical infrastructure, financial

Table 15. Multiple Regressions for Grade 8 in English, Kazakh, and Russian.

	English reading L3									
	Kazakh/bilingual ($n = 262$)					Russian/monolingual ($n = 413$)				
Independent variable	*r*	β	*r**β	*t*	*p*	*r*	β	*r**β	*t*	*p*
Kazakh reading	.156*	.099	.015	1.504	.134	.355**	.293	.104	5.898	.000
Russian reading	.184**	.184	.034	3.022	.003	.274**	.159	.044	3.202	.001
Factor 1	.028	.039	.001	.645	.519	−.055	−.050	.003	−1.087	.278
Factor 2	−.009	.017	−.000	.282	.778	.013	.004	.000	.081	.936
Factor 3	.077	.092	.007	1.507	.133	.027	.030	.001	.652	.515
R^2			**.057**					**.152**		
	Kazakh reading L1/L2									
	Kazakh/bilingual ($n = 262$)					Russian/monolingual ($n = 413$)				
Independent variable	*r*	β	*r**β	*t*	*p*	*r*	β	*r**β	*t*	*p*
Russian reading	.391**	.391	.153	6.849	.000	.394**	.321	.126	7.084	.000
English reading	.156*	.087	.014	1.504	.134	.355**	.267	.095	5.898	.000
Factor 1	−.072	−.045	.003	−.779	.437	−.020	.050	.001	1.128	.260
Factor 2	−.065	−.012	.001	−.201	.841	.025	.027	.001	.614	.540
Factor 3	−.112	−.080	.009	−1.393	.165	−.016	.020	.000	.444	.657
R^2			**.180**					**.223**		
	Russian reading L2/L1									
	Kazakh/bilingual ($n = 262$)					Russian/monolingual ($n = 413$)				
Independent variable	*r*	β	*r**β	*t*	*p*	*r*	β	*r**β	*t*	*p*
Kazakh reading	.391**	.371	.145	6.471	.000	.394**	.341	.134	7.171	.000
English reading	.184**	.126	.023	2.201	.029	.274**	.142	.039	2.978	.003
Factor 1	−.070	−.046	.003	−.801	.424	−.141**	−.121	.017	−2.711	.007
Factor 2	−.136*	−.111	.015	−1.957	.051	−.016	.080	.001	1.411	.159
Factor 3	−.085	−.051	.004	−.893	.373	−.120*	−.059	.007	−.900	.368
R^2			**.190**					**.198**		

Note. Factor 1 = global reading strategies; Factor 2 = problem-solving strategies; Factor 3 = support reading strategies.
The total variance explaining the impact of bilinguals and monolinguals are figures in bold. Figures are significant at $^{**}p < .01$. $^{*}p < .05$.

support, and resources in schools also influence the availability and appropriateness of reading materials and are significant for the development and implementation of more sophisticated RSs. Since good readers use the same RSs in the heritage and target languages, teachers should instruct young learners on how to use meaning-making strategies because the main goal of reading a text is to gain comprehension, understand the main idea, and start to think critically.

Various studies have suggested that a positive relationship between metacognitive RSs and reading achievement may affect and facilitate comprehension (e.g., Jiménez, 2000; Mokhtari & Reichard, 2002, 2004; Riches & Genesee, 2006; L. Zhang, 2018). However, the analysis showed a statistically significant ($p < .001$) negative relation between RSs and the reading comprehension test results in English, Kazakh, and Russian. This may be explained by the fact that young adolescents in Kazakhstan use either or both less and ineffective RSs in L1, L2, or EFL, or all three. The existing literature also indicates that if a reader focuses on less significant information, this may influence their achievement negatively compared to considering more important information (Rickards & August, 1975 as cited in Rao et al., 2007, p. 246). However, some studies have also found that the positive and negative impacts of RSs on reading achievement are related to the approaches used by readers, such as "deep" and "surface" reading (Cantrell & Carter, 2009; Rao et al., 2007; L. Zhang, 2001). The former occurs when the reader has a high level of language and achieves full reading comprehension, and the latter demonstrates the reader's fragile level of language proficiency and text understanding. In addition, studies assert that teaching reading instruction should be effectively highlighted and amply practiced. Moreover, research shows that proficient readers apply more metacognitive RSs than less proficient readers. Teachers, parents, and other stakeholders should pay

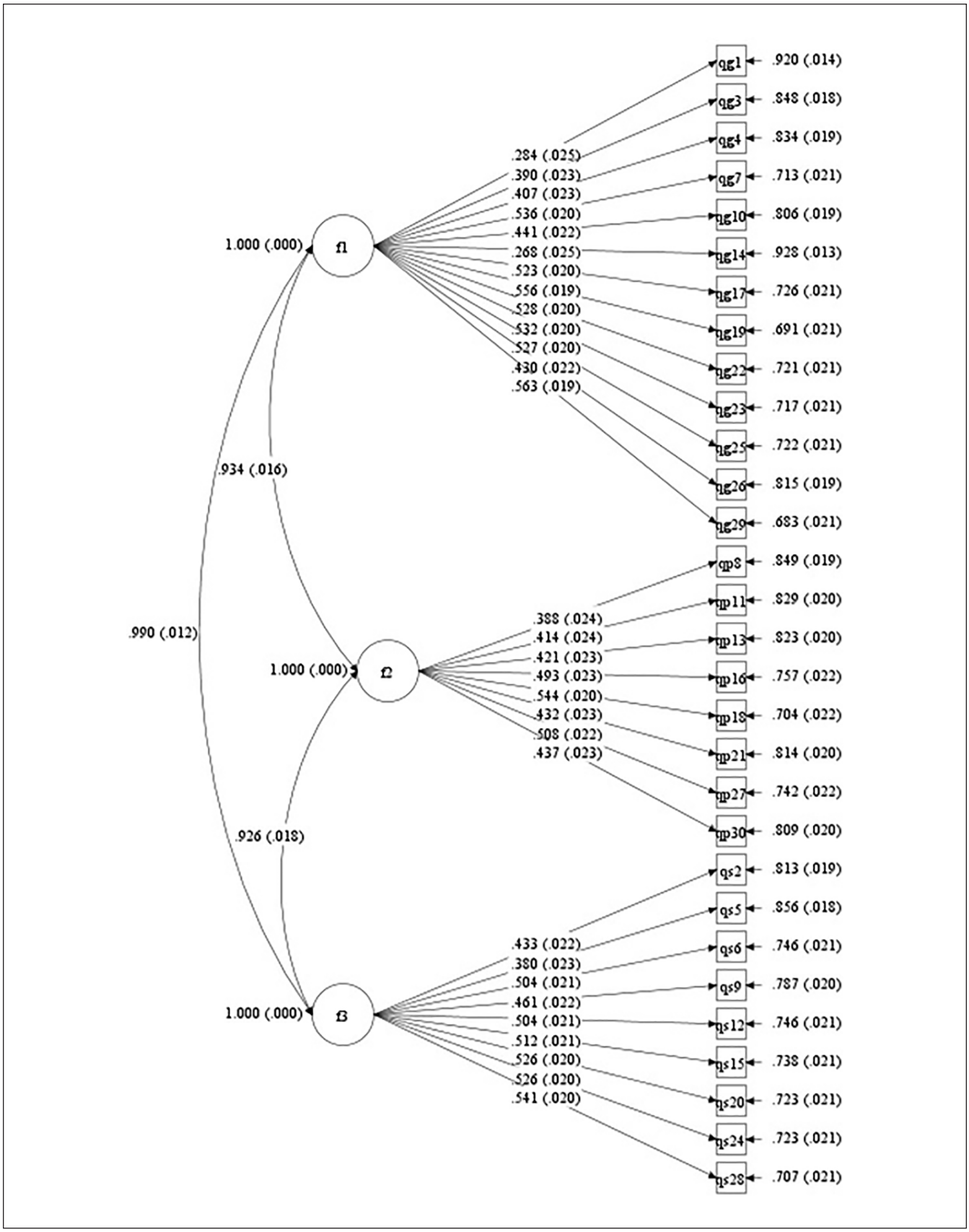

Figure 1. Confirmatory factor analysis of reading strategies in Grades 6 and 8.
Note. f1 = global reading strategies (factor 1); f2 = problem-solving strategies (factor 2); f3 = support reading strategies (factor 3).

Table 16. Reliability and Validity of the Factors.

Factor name	*N* items	Cronbach's alpha (α)	Composite reliability (CR)	Average variance extracted (AVE)
Global reading strategies	13	.777	.779647	.221237
Problem-solving strategies	8	.676	.676476	.209228
Support reading strategies	9	.738	.737806	.240069

attention to appropriate ways of instructing reading strategies to students that effectively develop reading skills and modify literacy.

For the monolinguals in both grades, the prediction of reading strategies and reading test results in EFL was almost 37% ($R^2 = .371$), whereas the prediction in English reading was 17% ($R^2 = .165$) for the bilinguals. It seems that more proficient readers use the same reading strategies in reading in their native (L1) and target languages (L2 and L3/EFL), whereas less proficient readers may implement less effective and inappropriate reading strategies in L1/L2 and L3/EFL reading. In this case, we may suppose that Kazakhstani bilinguals' and monolinguals' metacognitive awareness and reading comprehension in EFL are related weakly and moderately, respectively (L. Zhang et al., 2014).

The first trial attempt to validate the CFA of the MARSI questionnaire among young middle school learners in Kazakhstan calls for further in-depth research, as an ill-fitted CFA of the model may show that several items of various RSs overlap and have low loading. The low factor loading of the items may suggest a problem differentiating and comprehending the MARSI statements, which also seems to be difficult for young, bilingual and monolingual learners in the context of Kazakhstan.

Implications for Practice

The issue of RSs among young adolescents calls for further investigation to facilitate improvement in reading comprehension and enhance the effectiveness of strategies in the cognitive process. The results of the current study suggest that students experience challenges in reading unknown texts in EFL and in their native language. The medium level of students' RSs seemed to impact their use of the cognitive parts of RSs, such as attention, text evaluation, skimming, scanning, and managing reading procedures effectively and strategically in Kazakh, Russian, and English (Mokhtari & Reichard, 2002, p. 259). Background knowledge should also be taken into account as another factor that may influence learners' ability to use a RS appropriately. Therefore, teachers should observe and measure this factor in classrooms and apply more effective and beneficial strategies in the reading process. In addition, teachers should learn about and explore the reading materials that students usually engage with and carefully consider the implementation of RSs that facilitate reading comprehension. This will enhance learners' reading abilities and guide comprehension. A strongly significant correlation between factors, such as lack of instruction and limited practice of using RSs in L1, L2, and EFL, underpinned the prediction of low results in reading.

The results also showed that young learners had a stronger significant correlation between the Russian and Kazakh reading tests than with the English one. Although the number of items on the three reading tests was the same, a weaker correlation was found in both grades between the Kazakh-speaking English learners and the Russian-speaking English learners. This can be explained by the fact that the interaction in native language or L1 may be represented more frequently over the time in the communication rather than in L2 or EFL (see, e.g., Nikolov & Csapó, 2010, 2018). This substantial difference calls for further well-trained experience and practice among EFL teachers in middle school.

Limitations

The current study has several limitations. The first was that the sample did not involve enough grades (only sixth and eighth), schools (only seven randomly chosen public secondary schools from one city) and cities (only Pavlodar) of Kazakhstan. Secondly, an ill-fitting CFA model needs further adaptation, modification, and measurement. Thirdly, the study did not provide a qualitative analysis (i.e., interviews with teachers, parents, and other stakeholders about the language situation in the target schools). Finally, assessing the quality of teaching and learning languages of bilingual and monolingual students in Kazakh- and Russian-medium classes in Kazakhstan.

Conclusion and Suggested Further Research

The current study shows that young adolescents in bilingual and monolingual contexts may already have additional reading strategies, although these strategies are not effective in the reading process. Even the regression analysis shows that prediction of the factors on the results in R-squared does not equal zero; the correlation between the model and the dependent variables is statistically significant (in English—Factor 1; in Kazakh and Russian—Factor 3). This may suggest that constant assistance, frequent application of reading strategies, and appropriate and effective instruction are not common among young learners in L1, L2, or EFL.

Young Kazakhstani learners should be exposed to more sophisticated instruction on RSs when learning their L2 and

EFL to ensure better achievement and successful results in the future. Therefore, the importance of PISA for young learners in Kazakhstan is clear, as the economic success of a country depends on education and socio-economic development. It is also necessary to conduct an online assessment of the reading literacy of 15-year-old students because prior knowledge is crucial for young adolescents' further career pursuits. In addition, "fully equipped" course content (e.g., providing teachers an opportunity to fill the gaps in a course in terms of students' interests and preferences in reading) will enhance students' reading process and encourage them to acquire new information and skills. As this is our first attempt to examine reading strategies among bilinguals and monolinguals in middle school, further qualitative and quantitative investigations of reading strategies are called for in the upper grades.

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Supplemental Material

Supplemental material for this article is available online.

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