

Motivation, Strategy Use, and Comprehension in Foreign Language Reading: The Case of Saudi EFL Learners at the Preparatory Year

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Abstract—This study explored the relationships among reading motivation, reading strategy use and, reading comprehension in EFL reading. A cohort of 308 male and female EFL students at the preparatory year of an emerging Saudi university completed a reading motivation questionnaire, a reading strategy questionnaire, and a reading comprehension test. Independent samples t-test results revealed that students with high reading motivation (extrinsic, intrinsic, and efficacy) used three reading strategy categories (pre, while, and post-reading strategies) more frequently than students with moderate reading motivation. Similarly, students with high reading motivation were found to have better reading comprehension. Reading strategy use was also found to induce significant differences in students' reading comprehension. Results of multiple regression revealed that extrinsic motivation was the best predictor of students' reading strategy use and reading comprehension. Of all strategy categories, while-reading strategies were the best predictor of students' reading comprehension. Of all motivation and strategy factors, while-reading strategies, reading efficacy and extrinsic motivation significantly predicted reading comprehension, with while-reading strategies being the strongest predictor. Implications for reading instruction and suggestions for further research are offered.

Index Terms—reading motivation, reading strategy use, reading comprehension, EFL reading, Saudi preparatory year students

I. INTRODUCTION

Reading proficiency is indispensable for FL learners because it is their primary source of language input. Becoming proficient readers of English is a determinant of success for students intending to study medicine, engineering, and computer science (the population of the current study). The programs offered to these students in any country, including Saudi Arabia use English as the medium of instruction. The content of study courses in these disciplines is written basically in English. Thus, good reading proficiency will benefit these students in their university study. Furthermore, graduates of these programs need to keep in touch with their disciplines for professional development. A physician for instance needs to get updated on innovations in the medical field. In an EFL setting, reading can be the only means to this end. Thus, investigating these students' EFL reading and the factors affecting it is a topic that deserves to be researched. Reading is affected by a number of factors, at the top of which are reading motivation and self-regulated reading strategy use. Several studies revealed a positive relationship between EFL reading motivation and reading comprehension (e.g., Dhanapala, 2008; Lin et al., 2012; Han, 2021; Li & Gan, 2022). However, there are studies that reported no positive correlation between them (e.g., Ölmez, 2015; Meniado, 2016). Similarly, in several studies conducted in various EFL settings, reading strategy use correlated positively with reading comprehension (Phakiti, 2003; Zhang & Seepho, 2013; Abbasian & Hartoonian, 2014; Islam, 2018; Zarei, 2018; Han, 2021; Mohammed, 2022; Oranpattanachai, 2023). However, in other studies, no correlation was found between them (Shang, 2010; Meniado, 2016; Sari, 2016; Zhang & Sukying, 2022). The mixed research findings provide a rationale for further examination of the relationships among motivation, strategy use, and comprehension in FL reading. Furthermore, the relationship among the three variables has not been sufficiently researched in the Saudi context. Thus, this study aimed to explore Saudi EFL preparatory year students' reading comprehension and its relation to their reading motivation and reading strategy use. This investigation is expected to offer important implications for EFL reading instruction in Saudi Arabia. More specifically, the study addressed the following questions:

1. What is the profile of Saudi EFL students' reading motivation, strategy use and comprehension?
2. Are there significant differences in students' reading strategy use and comprehension by reading motivation?
3. Are there significant differences in students' reading comprehension by reading strategy use?
4. What are the contributions of students' reading motivation to their reading strategy use and comprehension?
5. What are the contributions of students' reading strategy use to their reading comprehension?

II. LITERATURE REVIEW

A. *The Reading Motivation Construct*

Motivation is essential for successful FL learning because it “provides the primary impetus to initiate FL learning and later the driving force to sustain language and often tedious learning process” (Dörnyei, 2005, p. 65). Reading motivation according to Guthrie and Wigfield (2000) refers to people’s purposes, values and thoughts in relation to the themes, procedures, and outputs of reading. Similarly, Schiefele et al. (2012) define reading motivation as people’s subjective reasons for reading. A student may be motivated to read due to a personal interest in a particular topic or due to an external incentive like obtaining good grades or gaining recognition. Still, a student may be motivated to read for both personal interest and external incentives. That is, there is no one single incentive for reading that is true for all people. Researchers thus suggest that reading motivation is multidimensional in that it is a construct encompassing several interrelated dimensions. Mori (2002) examined the construct of reading motivation among Japanese EFL university students and could establish that Japanese EFL university students’ reading motivation comprises four dimensions, namely, the intrinsic value of reading, the extrinsic utility value of reading, the importance of reading, and reading efficacy. Starting from an assumption that a motivational construct developed for L1 reading may not work for FL reading, Erten et al. (2010) developed a model of reading motivation for Turkish EFL university students without drawing upon any previous theories of motivation. Instead they pooled students’ incentives for EFL reading through five open-ended questions. Students’ opinions were then included in a scale they named The Foreign Language Reading Motivation and Attitudes Scale. EFA produced a four factor structure comprising the intrinsic value of reading, reading efficacy, the extrinsic utility value of reading, and foreign language linguistic utility. Investigating the reading motivation of university English language learners in China, Han (2021) identified three scales comprising students’ reading motivation: one for intrinsic motivation (efficacy and engagement) and two for extrinsic motivation (utility value and academic value). Wang and Gan (2021) also offered a research-based reading motivation model for Chinese EFL learners comprising five dimensions: efficacy, enjoyment, recognition, involvement, and compliance.

There seems to be common constituents in the reading motivation models developed by researchers in different contexts. These are intrinsic motivation, extrinsic motivation, and reading efficacy. Intrinsic motivation refers to “motivation to engage in an activity for its own sake”, while extrinsic motivation refers to “motivation to engage in an activity as a means to an end” (Pintrich & Schunk, 2002, p. 245). Students who find reading interesting and challenging are intrinsically motivated to read. In contrast, students who read for external factors like obtaining recognition are extrinsically motivated to read. Researchers mention a number of differences between students with intrinsic and extrinsic reading motivation. Students with intrinsic motivation are involved in reading, use effective reading strategies, invest effort to promote their reading, share reading experiences with others, read for pleasure and knowledge, and have positive attitudes towards reading. Students with extrinsic motivation, on the other hand, read because they must, use less reading learning strategies, do not invest effort to promote their reading, do not like to talk about reading, read for external rewards, and have less positive attitudes towards reading. However, intrinsic motivation is not necessarily correlated with better reading in all cultures. The relative impact of both types of motivation is culture-bound. In several FL reading studies, only extrinsic motivation correlated positively with reading achievement and in other studies reading achievement correlated positively with both intrinsic and extrinsic motivation. This gives a rationale for investigating the impact of both types of motivation on students’ reading performance in different cultures. Efficacy refers to “people’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performances” (Bandura, 1986, p. 391). Bandura (1986) attributes poor performance in any kind of learning not to lack of ability, but to lack of confidence in own ability to perform successfully.

B. *The Relationship Between Reading Motivation and Reading Comprehension*

Mixed research findings were reported regarding the impact of intrinsic and extrinsic motivation on EFL reading achievement, with neither, either, or both of them reported to be positively (and even negatively in the case of extrinsic motivation) correlated with reading achievement. For example, in Han’s (2021) study, the reading proficiency of 186 Chinese university English language learners positively correlated with an intrinsic reading scale comprising efficacy and engagement, while it did not correlate with two extrinsic motivation scales comprising utility value and academic value. In a study conducted with 114 Turkish EFL university freshmen, Ölmez (2015) found no correlations between reading comprehension and intrinsic motivation (intrinsic value of reading and reading efficacy) or extrinsic motivation (utility value of reading and language linguistic utility). In a study conducted on Hong Kong EFL primary students by Lin et al. (2012), instrumentalism (i.e., extrinsic motivation) correlated positively with reading comprehension. Using a sample of 247 Sri Lankan and Japanese EFL students, Dhanapala (2008) found that the reading comprehension of Sri Lankan students strongly and positively correlated with all intrinsic (curiosity, involvement, and challenge) and extrinsic motivation (recognition, grades, competition and compliance) scales except for social reading.

Dhanapala and Hirakawa (2016) found that extrinsic motivation negatively linked with the English reading comprehension of 406 EFL Sri Lankan university students. Using a single composite measure of reading motivation comprising intrinsic and extrinsic motivation with 60 Saudi EFL university students, Meniado (2016) found no relation between motivation and reading comprehension. Fauzi et al. (2022) found a significant correlation between reading motivation and the reading comprehension of 36 Indonesian EFL university students. The motivation questionnaire

employed in the study included intrinsic and extrinsic motivation (drive to excel, academic compliance, test compliance, and social sharing). However, the last two studies (Meniado, 2016; Fauzi et al., 2022) used a single composite score of motivation. This, according to Wang et al. (2020), is inappropriate because a single composite measure of motivation blurs or neutralizes the relative effect of each motivational orientation. Reading efficacy has been generally found to correlate positively with reading comprehension in several EFL settings, e.g., Iran (Ghabdian & Ghafournia, 2016; Zarei, 2018), Turkey (Tercanlioglu, 2002), Indonesia (Fitri et al., 2019), Malaysia (Habibian & Roslan, 2014), Saudi Arabia (Mohammed, 2022), and Thai (Oranpattanachai, 2023).

C. The Relationship Between Reading Motivation and Reading Strategy Use

Studies generally found a positive relationship between motivation, particularly intrinsic motivation and reading strategy use. Han (2021) investigated the relationship between motivation and reading strategies of 168 Chinese university English language learners. Intrinsic motivation (efficacy and engagement) and extrinsic motivation (utility value and academic value) positively correlated with metacognitive strategies and cognitive strategies, with correlations between intrinsic motivation and reading strategies being stronger. Dison and Shah (2020) reported a positive relationship between the reading motivation of 81 Malaysian secondary school students and their global, problem and support reading strategies. No distinction was made in this study between intrinsic and extrinsic motivation. Meniado (2016) reported a positive correlation between reading motivation and metacognitive reading strategies among 60 Saudi college-level EFL students. However, a single composite score of motivation was used without reference to specific types of reading motivation. The relationship between EFL reading motivation and reading strategies still needs to be researched. Reading efficacy has also been found to correlate positively with strategy use in EFL reading (Shang, 2010; Mohammed, 2022). That is, students with high reading efficacy use reading strategies more frequently than students with low reading efficacy.

D. Reading Strategies

Reading strategies are deliberate and goal-oriented processes that enable learners to construct meaning out of text (Afflerbach et al., 2008). Sheorey and Mokhtari (2001) suggest that reading strategies are “deliberate, conscious procedures used by readers to enhance text comprehension” (p. 433). Various classifications of reading strategies have been offered elsewhere. According to the most widespread classification, reading strategies are classified into cognitive and metacognitive strategies. Cognitive strategies operate directly on incoming information, manipulating it in ways that enhance learning (Mokhtari & Reichard, 2002). In other words, cognitive strategies include actions readers take to manipulate the reading material, e.g., predicting, elaborating, inferencing, summarizing, and note-taking (Phakiti, 2003). Metacognitive strategies are tactics used by readers to manage their reading. They are not directly related to the language being read. They include actions taken to plan, monitor and regulate reading (Pintrich, 1999). Examples of planning strategies are setting goals for reading; skimming the text before in-depth reading; and self-questioning before reading. Monitoring strategies include checking comprehension; tracking attention; and reflecting on the reading task. Regulatory strategies include such strategies as slowing the pace of reading with difficult parts of the text, rereading difficult parts of the text; and getting back on track when losing concentration. Another widely cited classification of reading strategies is the classification offered by Mokhtari and Reichard (2002). They classified reading strategies into global reading strategies, problem-solving reading strategies, and support reading strategies. Global strategies are tactics used by readers to monitor or manage their reading. Problem-solving strategies are tactics used by readers to solve problems in understanding what is being read. Finally, support strategies are mechanisms that aid the reader in comprehending the text, e.g., using a dictionary, taking notes, or underlining or highlighting important information. Reading strategies are also classified based on the stage of reading into pre, while, and post-reading strategies (Paris et al., 1996). Researchers who use this classification aim to identify if students prepare for the reading act and reflect on it when it is over.

E. The Relationship Between Reading Strategy Use and Reading Comprehension

Studies reported mixed findings regarding the relationship between reading strategies and reading comprehension of FL learners, with some studies reporting a positive relationship (Phakiti, 2003; Zhang & Seepho, 2013; Abbasian & Hartoonian, 2014; Islam, 2018; Zarei, 2018; Han, 2021; Mohammed, 2022; Oranpattanachai, 2023) and others reporting no correlation (Shang, 2010; Meniado, 2016; Sari, 2016; Zhang & Sukying, 2022) between them. For instance, one, some, or all of cognitive, metacognitive, compensation, global, problem-solving, and support reading strategies correlated positively with the reading performance of 183 Saudi university EFL learners (Mohammed, 2022), 186 Chinese university EFL learners (Han, 2022), 119 Iranian undergraduate and postgraduate EFL learners (Zarei, 2018), 113 Indonesian high school students (Islam, 2018), 115 Iranian university EFL learners (Abbasian & Hartoonian, 2014), 80 Iranian EFL university learners (Zare, 2013), 33 Chinese university EFL learners (Zhang & Seepho, 2013), and 384 Thai university EFL learners (Phakiti, 2003). On the other hand, none of cognitive, metacognitive, compensation, global, problem-solving, and support reading strategies correlated positively with the reading performance of 199 Thai university EFL learners (Zhang & Sukying, 2022), 74 Indonesian secondary school students (Aini & Akhiriyah, 2022), 60 Saudi EFL university students (Meniado, 2016), 132 Indonesian EFL pre-service teachers (Sari, 2016), 53

Taiwanese learners (Shang, 2010), and 290 Chinese EFL university learners (Li & Kaur, 2014). Further research is thus required regarding the effect of reading strategy use on EFL learners' reading performance.

III. METHODOLOGY

A. Participants

Participants in this study were Preparatory Year Program (PYP) students ($n = 308$) at an emerging Saudi University. Upon successful completion of the PYP, students initiate their main university study in medicine ($n = 145$, 41.1%), nursing ($n = 81$, 26.3%), and engineering and computer science ($n = 82$, 26.6%). Admission to any of these tracks depends on the GPA in the PYP and the IELTS score. Of the 308 participants, 186 (60.4%) were females and 122 (39.6%) were males. Students are admitted to the PYP program after they graduate from high school (the science stream) and satisfy the admission criteria for the PYP. They are native speakers of Arabic and have the same English language experience in terms of years of study and exposure to the English language.

B. Instruments

(a). *The Reading Motivation Questionnaire*

A 23-item questionnaire was used to assess students' reading motivation. The items were adapted or developed making use of frequently cited EFL reading motivation questionnaires (Wigfield & Guthrie, 1997; Mori, 2002; Erten et al., 2010). Originally, the questionnaire had 30 items representing four components of EFL reading motivation: the intrinsic value of reading, the extrinsic value utility of reading, reading efficacy, and the importance of reading. EFA with Varimax rotation, eigenvalues of ≥ 1 and a loading of 0.40 was then conducted on the data of the participants' completed questionnaires to decide on the items to be included in data analysis. To establish the factorability of the data, Kaiser-Meyer-Olkin's measure of sampling adequacy and Bartlett's test of Sphericity were computed. Kaiser-Meyer-Olkin's measure of sampling adequacy was 0.925, which was acceptable. Bartlett's test of Sphericity was 3601.339 ($p < .000$), which was significant. Seven items were excluded because they either cross-loaded on more than one factor (five items) or did not load significantly on any factor (two items) and the correlation matrix was reanalyzed. A three factor solution including 23 items was found, which accounted for 57% of the total variance. The first factor had ten items and accounted for 38.62% of the variance. The major theme in this factor was *extrinsic motivation*. This factor included in addition to items relating to the extrinsic value of reading items that came under separate factors in other samples, namely the importance of reading (Mori, 2002) and the linguistic utility of reading (Erten et al., 2010). That is, it included items that came in other samples under the two separate factors of the extrinsic value and the importance or linguistic utility of reading. Examples of this factor's items are "Reading in English is beneficial for self-development" and "Good reading ability in English will help me in my future career". The second factor with seven items accounted for 11.40% of the variance. Items in this factor related to beliefs about *reading efficacy*. Examples of this factor's items are "I know what to do when I don't understand what I am reading" and "I can handle challenging reading materials". The third factor with six items accounted for 6.6% of the variance and related to the *intrinsic motivation*. Example items under this factor are "Reading in English is self-fulfilling", "The more I read in English, the more I want to read" and "I tend to get deeply engaged when I read in English". The extrinsic motivation factor, the reading efficacy factor, the intrinsic motivation factor, and the total questionnaire yielded high alpha reliability estimates: 0.90, 0.85, 0.84 and 0.92 respectively, indicating that the questionnaire was quite reliable. To control for the participants' English linguistic competence compromising their ability to respond to the items, the questionnaire was administered in Arabic. Participants responded to items by indicating how far they agreed to the statements on a five-point rating scale ranging from 1 "Strongly Disagree" to 5 "Strongly Agree". Items with negative statement were reverse coded so that higher means indicated higher motivation.

(b). *The Reading Strategy Questionnaire*

Based on a survey of relevant questionnaires in previous studies (Mokhtari & Sheorey, 2002; Phakiti, 2003; Zhang et al., 2014), items incorporating 37 strategies were adapted. EFA was then conducted to decide on the items to be included in data analysis. Kaiser-Meyer-Olkin's measure of sampling adequacy was 0.873, which was acceptable. Bartlett's test of Sphericity was 3043.149 ($p < .000$), which was significant. Five items were excluded because they either cross-loaded on more than one factor (four items) or did not load significantly on any factor (one item) and the correlation matrix was reanalyzed. An eight factor solution including 32 items was generated, which accounted for 58.80% of the total variance. The first factor had six items and accounted for 21.06% of the variance. Items in this factor related to *regulating* reading (e.g., "I try to get back on track when I lose concentration" and "If I come at difficult parts in the text, I reread to understand them better"). The second factor with five items pertained to *predicting* (e.g., "I ask myself questions I predict to have answered in the text" and "I try to predict incoming content using the information being read") and accounted for 10.72 of the variance. The third factor related to *elaborating* (e.g., "I compare what I read with what I know about the topic" and "I use my background knowledge and common sense to understand what I'm reading"). It had five items and accounted for 8.53 of the variance. The fourth factor with five items relating to *inferencing* (e.g., "I use the words I know to guess the meaning of the words I don't know" and "I use

linguistic clues such as prefixes and suffixes to figure out the meaning of difficult words”) accounted for 6.471 of the variance. The fifth factor accounting for 3.92 of the variance consisted of three items whose main theme was *reflecting* on reading (e.g., “I reflect on my problems or difficulties and how to overcome them the next time” and “I think back to how I read and about what I might do differently the next time”). The sixth factor pertained to *monitoring* (e.g., “I stop from time to time to think about what I’m reading” and “If the text becomes difficult, I read aloud to understand what I’m reading”). With its four items, it accounted for 3.53 of the variance. The seventh factor with its two items (e.g., “I take notes in the margin to help me understand what I’m reading”) related to *note-taking* and accounted for 2.38 of the variance. Finally, the eighth factor had two items relating to *initial reading* (e.g. “I skim the text to see what it is about”) and accounted for 2.17 of the variance. The final version of the questionnaire thus included three metacognitive strategy categories: regulating (six items), monitoring (four items), and reflecting (three items). Meanwhile, it had five cognitive categories: predicting (five items), elaborating (five items), inferencing (five items), note-taking (two items), and initial reading (two items). However, the classification of strategies based on the stages of reading, i.e., pre, while, and post-reading was adopted in this study to check if students used strategies before and after reading. There were six pre-reading, twenty-two while-reading, and four post-reading strategies. The three types included cognitive and metacognitive strategies. The pre-reading, while-reading, post-reading, and total strategies yielded acceptable alpha estimates: 0.65, 0.85, 0.68, and 0.89 respectively, indicating that the questionnaire was quite reliable. The participants responded to items in Arabic based on a scale of five anchors ranging from 1 “Strongly Disagree” to 5 “Strongly Agree”.

(c). *The Reading Comprehension Test*

The students’ reading comprehension was assessed by a composite score of their scores in the reading sections in four formal exams they took before they participated in the study: the midterm and final exams of course ENGL109 (The English Language 1) and course ENGL 110 (The English Language 2) of the first semester, 2022/23. In each of the four exams, students read an English passage and answered 10 multiple-choice questions on it, i.e., a total of four passages and 40 questions. Thus, a student’s reading score ranged between 0 and 40. The reading skills measured in the questions included identifying main ideas and supporting details, identifying cause and effect relationships, guessing the meaning of difficult words, determining the author’s purpose, and making conclusions.

IV. DATA COLLECTION AND ANALYSIS

The questionnaires were administered to the participants electronically toward the end of the first semester of the academic year 2022/23. Students in the PYP are added to a channel in Microsoft Teams where all announcements and questionnaires are shared with them. Descriptive statistics were used to identify the general profile of students’ reading motivation, strategy use and comprehension. The t-test for independent samples were used to identify the effect of reading motivation on students’ reading strategy use and reading comprehension, and the effect of reading strategy use on their reading comprehension. Finally, stepwise multiple regression analysis was used to identify the contributions of students’ reading motivation to their reading strategy use and comprehension, and the contributions of students’ reading strategy use to their reading comprehension.

V. RESULTS

A. *The Profile of Students’ Reading Motivation, Strategy Use and Comprehension*

Table 1 presents the descriptive statistics of the three variables. Skewness and kurtosis values ranged between -2 and 2, revealing that the variables were normally distributed (Bachman & Kunnan, 2005). Of the three reading motivation factors, extrinsic motivation ranked first ($M = 4.30$, $SD = 0.669$), followed by reading efficacy ($M = 3.64$, $SD = 0.759$) and intrinsic motivation ($M = 3.52$, $SD = 0.841$). The mean of students’ extrinsic reading motivation was substantially larger than the means of the other two motivation factors. This reveals that students are substantially extrinsically motivated to read. However, the means of the other two motivation factors are above 3.50 (Oxford, 2001), indicating that students are also highly efficacious about their reading and highly intrinsically motivated to read. Of the three reading strategy categories, while-reading strategies ($M = 3.74$, $SD = 0.526$) ranked first, followed by post-reading strategies ($M=3.70$, $SD=0.531$) and pre-reading strategies ($M = 3.58$, $SD = 0.638$). This indicates that students use while-reading strategies most frequently, followed by post-reading strategies and pre-reading strategies. The means of all individual strategy categories are above 3.50, indicating that students use all reading strategies with high frequency. Finally, the average of students’ reading comprehension (27.1) was above the mid-point (20). That is, students’ reading comprehension was above average.

TABLE 1
DESCRIPTIVE STATISTICS OF READING MOTIVATION, STRATEGY USE AND COMPREHENSION (N = 308)

	Subscale	Min	Max	M	SD	Skewness	Kurtosis
Reading motivation	Extrinsic motivation	1.3	5.0	4.30	0.67	-01.2	1.79
	Reading efficacy	1.1	5.0	3.64	0.76	-0.18	-0.32
	Intrinsic motivation	1.0	5.0	3.52	0.84	-0.32	-0.28
Reading strategies	Pre-reading strategies	1.7	5.0	3.58	0.64	-0.25	0.19
	while-reading strategies	2.3	5.0	3.73	0.53	0.08	-0.12
	post-reading strategies	1.0	5.0	3.70	0.76	-0.38	0.14
Reading comprehension	Reading comprehension	12	38	27.1	4.56	-0.63	1.18

B. Differences in Reading Strategy Use and Comprehension by Reading Motivation

The independent samples t-test was used to identify the differences between highly and moderately motivated students in reading strategy use and comprehension. For this purpose, the students were grouped into highly and moderately motivated based on their means, using Oxford’s (2001) scoring system: high (mean of 3.5 or higher), medium (mean of 2.5 - 3.4), and low (mean of 2.4 or lower). None of the students’ means of the three motivation factors was lower than 2.4 and hence there was no category for low motivated students.

Students with high extrinsic and intrinsic motivation and high reading efficacy were found to use all reading strategy categories more frequently and have better reading comprehension than their counterparts with moderate extrinsic and intrinsic motivation and moderate reading efficacy. All differences were significant at the 0.01 level, except for the difference between highly and moderately efficacious students in the use of post-reading strategies (p = 0.05). Overall, these results show that all three factors of reading motivation, i.e., extrinsic and intrinsic reading motivation and reading efficacy positively affected students’ reading strategy use and reading comprehension.

TABLE 2
DIFFERENCES IN STUDENTS’ READING STRATEGY USE AND COMPREHENSION BY THEIR READING MOTIVATION

Dependent variable	Motivation group	N	M	SD	t-value	p
Pre-reading strategies	High extrinsic	222	3.65	0.61	4.73	0.000
	Moderate extrinsic	86	3.12	0.63		
	Highly efficacious	174	3.75	0.60	5.17	
	Moderate efficacious	134	3.38	0.62		
	High intrinsic	176	3.77	0.61	5.94	
	Moderate intrinsic	132	3.35	0.59		
While-reading strategies	High extrinsic	222	3.82	0.48	8.68	0.000
	Moderate extrinsic	86	3.07	0.42		
	Highly efficacious	174	3.87	0.48	5.45	
	Moderate efficacious	134	3.55	0.54		
	High intrinsic	176	3.88	0.51	6.06	
	Moderate intrinsic	132	3.53	0.49		
Post-reading strategies	High extrinsic	222	3.78	0.74	5.33	0.000
	Moderate extrinsic	86	3.08	0.65		
	Highly efficacious	174	3.80	0.75	2.52	
	Moderate efficacious	134	3.58	0.76		
	High intrinsic	176	3.84	0.79	3.85	
	Moderate intrinsic	132	3.51	0.68		
Reading comprehension	High extrinsic	222	27.6	4.13	6.07	0.000
	Moderate extrinsic	86	22.9	5.55		
	Highly efficacious	174	28.0	4.13	4.11	
	Moderate efficacious	134	25.9	4.82		
	High intrinsic	176	27.8	4.52	3.20	
	Moderate intrinsic	132	26.1	4.44		

C. Differences in Reading Comprehension by Reading Strategy Use

It is clear from Table 3 that students who used all individual reading strategy categories more frequently had better reading comprehension. All differences were significant (p = 0.01), indicating that reading strategy use had a positive effect on students’ reading comprehension, with while-reading strategies having the strongest effect.

TABLE 3
DIFFERENCES IN STUDENTS’ READING COMPREHENSION BY THEIR READING STRATEGY USE

Dependent variable	Strategy group	N	M	SD	t-value	p
Pre-reading strategies	High strategy users	196	27.8	4.14	3.8	0.000
	Moderate strategy users	112	25.8	4.97		
While-reading strategies	High strategy users	213	27.9	4.11	4.8	0.000
	Moderate strategy users	95	25.3	4.99		
Post-reading strategies	High strategy users	202	27.7	4.20	3.4	0.000
	Moderate strategy users	106	25.9	4.97		

D. Contributions of Reading Motivation to Reading Strategy Use and Reading Comprehension

All motivation factors and reading strategy categories significantly and positively correlated with one another ($r = 0.23 - 0.63$, $p = 0.01$). Reading comprehension significantly and positively correlated with all motivation factors and reading strategy categories ($r = 0.21 - 0.34$, $p = 0.01$). These results are shown in Table 4 below.

TABLE 4
CORRELATIONS AMONG STUDENTS' READING MOTIVATION, STRATEGIES AND COMPREHENSION

	1	2	3	4	5	6	7
1. Extrinsic reading motivation	-						
2. Reading efficacy	0.486**	-					
3. Intrinsic reading motivation	0.546**	0.631**	-				
4. Pre-reading strategies	0.303**	0.339**	0.386**	-			
5. While-reading strategies	0.512**	0.428**	0.413**	0.633**	-		
6. Post-reading strategies	0.373**	0.232**	0.320**	0.397**	0.593**	-	
7. Reading comprehension	0.314**	0.304**	0.214**	0.283**	0.338**	0.226**	-

Stepwise regression analysis was conducted to further evaluate the contribution of reading motivation to reading strategy use and reading comprehension. As shown in Table 5, extrinsic motivation significantly and positively predicted students' reading comprehension ($\beta = 0.218$, $t = 3.56$, $p \leq 0.001$), while-reading strategies ($\beta = 0.398$, $t = 7.28$, $p \leq 0.001$), and post-reading strategies ($\beta = 0.282$, $t = 4.50$, $p \leq 0.001$). This indicates that students with high extrinsic reading motivation are more likely to (1) use reading strategies more frequently while and after reading, and (2) have better reading comprehension. Reading efficacy significantly and positively predicted students' reading comprehension ($\beta = 0.198$, $t = 3.24$, $p \leq 0.001$), pre-reading strategies ($\beta = 0.185$, $t = 2.35$, $p \leq 0.05$), and while-reading strategies ($\beta = 0.235$, $t = 4.30$, $p \leq 0.001$). That is, students with high reading efficacy are more likely to (1) use reading strategies more frequently before and while reading, and (2) have better reading comprehension. Intrinsic reading motivation only significantly and positively predicted students' pre-reading strategies ($\beta = 0.286$, $t = 4.23$, $p \leq 0.001$) and post-reading strategies ($\beta = 0.166$, $t = 2.64$, $p \leq 0.01$). This shows that students with high intrinsic reading motivation are more likely to use pre and post-reading strategies more frequently. Overall, the best predictor of students' reading strategy use and reading comprehension was extrinsic motivation, followed by reading efficacy. Intrinsic motivation failed to predict students' reading comprehension.

TABLE 5
STEPWISE REGRESSION FOR PREDICTING STRATEGY USE AND COMPREHENSION BY READING MOTIVATION

Dependent variables	Independent variables	B	SE	β	t	R	R ²
Pre-reading strategies	Intrinsic motivation	0.217	0.051	0.286	4.23***	0.405	0.164
	Reading efficacy	0.133	0.057	0.158	2.35*		
While-reading strategies	Extrinsic motivation	0.316	0.043	0.398	7.28***	0.552	0.304
	Reading efficacy	0.165	0.038	0.235	4.30***		
Post-reading strategies	Extrinsic motivation	0.321	0.071	0.282	4.50***	0.398	0.158
	Intrinsic motivation	0.150	0.057	0.166	2.64**		
Reading comprehension	Extrinsic motivation	1.482	0.416	0.218	3.56***	0.359	0.129
	Reading efficacy	1.190	0.367	0.198	3.24***		

When all motivation factors were entered as predictors of total reading strategies, the regression analysis produced three models (Table 6). In model 1, extrinsic motivation alone ($\beta = 0.505$, $t = 10.2$, $p \leq 0.001$) significantly and positively contributed to reading strategy use with 25.5%. In the second model, both extrinsic motivation ($\beta = 0.389$, $t = 7.09$, $p \leq 0.001$) and reading efficacy ($\beta = 0.239$, $t = 4.35$, $p \leq 0.001$) significantly and positively contributed to reading strategy use with 29.9%. In the third model, extrinsic motivation ($\beta = 0.341$, $t = 5.85$, $p \leq 0.001$), reading efficacy ($\beta = 0.165$, $t = 2.62$, $p \leq 0.01$), and intrinsic motivation ($\beta = 0.154$, $t = 2.35$, $p \leq 0.05$) significantly and positively contributed to reading strategy use with about 31.1%. Overall, the best predictor of students' reading strategy use was extrinsic motivation, followed by reading efficacy, and intrinsic motivation.

TABLE 6
STEPWISE REGRESSION FOR PREDICTING OVERALL STRATEGY USE BY READING MOTIVATION

Predictors	B	SE	β	F	t	R	R ²
Model 1							
Extrinsic motivation	0.39	.038	0.505	104.7***	10.2***	0.505	0.255
Model 2							
Extrinsic motivation	0.30	.042	0.389	64.91***	7.09***	0.546	0.299
Reading efficacy	0.16	.037	0.239		4.35***		
Model 3							
Extrinsic motivation	0.26	.045	0.341	45.76***	5.85***	0.558	0.311
Reading efficacy	0.11	.042	0.165		2.62**		
Intrinsic motivation	0.09	.040	0.154		2.35*		

E. Contributions of Reading Strategy Use to Students' Reading Comprehension

Results of the regression analysis regarding the prediction of students' reading comprehension by their reading strategy use are presented in Table 7. Of all the three reading strategy categories, only while-reading strategies significantly and positively ($\beta = 0.338, t = 6.29, p \leq 0.001$) predicted students' reading comprehension. It predicted 11.5% of the variance in students' reading comprehension. That is, students with higher use of while-reading strategies have better reading comprehension.

TABLE 7
STEPWISE REGRESSION FOR PREDICTING READING COMPREHENSION BY READING STRATEGY USE

Dependent variable	Independent variables	B	SE	β	t	R	R ²
Reading comprehension	While-reading strategies	2.90	0.46	0.338	6.29***	0.338	0.115

*** $p \leq 0.001$

F. Contributions of Motivation Factors and Reading Strategies to Reading Comprehension

When all motivation and strategy factors were entered as predictors of reading comprehension, the regression analysis generated three models. In model 1, while-reading strategies ($\beta = 0.338, t = 6.29, p \leq 0.001$) alone significantly and positively contributed to reading comprehension with 11.5%. In the second model, both while-reading strategies ($\beta = 0.225, t = 4.35, p \leq 0.001$) and reading efficacy ($\beta = 0.195, t = 3.32, p \leq 0.05$) significantly and positively contributed to reading comprehension with 14.5%. In the third model, while-reading strategies ($\beta = 0.204, t = 3.24, p \leq 0.001$), reading efficacy ($\beta = 0.150, t = 2.42, p \leq 0.05$), and extrinsic motivation ($\beta = 0.136, t = 2.09, p \leq 0.05$) significantly and positively contributed to reading comprehension with about 16%. This indicates that while-reading strategies and reading efficacy are the strongest predictors of students' reading comprehension.

TABLE 8
STEPWISE REGRESSION FOR PREDICTING READING COMPREHENSION BY MOTIVATION AND STRATEGY USE

Predictors	B	SE	β	F	t	R	R ²
Model 1							
While-reading strategies	2.90	0.46	0.338	39.59***	6.29***	0.338	0.115
Model 2							
While-reading strategies	2.19	0.50	0.255	25.97***	4.35***	0.381	0.145
Reading efficacy	1.17	0.35	0.195		3.32***		
Model 3							
While-reading strategies	1.75	0.54	0.204	18.96***	3.24***	0.397	0.158
Reading efficacy	0.90	0.37	0.150		2.42*		
Extrinsic motivation	0.93	0.44	0.136		2.09*		

VI. DISCUSSION

The results revealed that students were generally highly motivated to read. That students were both extrinsically and intrinsically motivated provides support to the self-determination theory, which suggests that the two motivational orientations are not mutually exclusive (Ryan & Deci, 2016). Nonetheless, the students were more extrinsically (M = 4.30) than intrinsically (M = 3.52) motivated to read. This finding echoes previous research reporting that FL learners read for both extrinsic and intrinsic reasons, with extrinsic reasons being more overwhelming (e.g., Dhanapala, 2008; Ölmez, 2015; Li & Gan, 2022). This seems logical in an FL setting like the Saudi one where the FL is used only in educational settings. It seems that the explanation that EFL university students read English mainly to reach their instrumental goals such as pursuing further studies (Kim, 2011; Lin et al., 2012) applies to the current sample. The students were also found to be highly self-efficacious about their EFL reading. This finding contradicts previous research where FL learners were found to have poor (Li & Gan, 2022) or moderate (Alsuhaibani, 2019; Mohammed, 2022) reading efficacy. A possible explanation for this finding is that students, being among the top five percent of secondary school graduates and being admitted to programs like medicine and engineering, have confidence in their English reading ability.

As to reading strategy use, the results revealed that the students were high users of all reading strategy categories, with while-reading strategies used most frequently, followed by post-reading and pre-reading strategies. This finding partly echoes the study of Ozek and Civelek (2006) where Turkish EFL university learners were found to use while-reading strategies more frequently, followed by pre-reading strategies and post-reading strategies. It also partly echoes the study of Nordin et al. (2013) where Malaysia university high achievers used post-reading strategies more frequently, followed by while-reading strategies and pre-reading strategies. Malaysian university low achievers used while-reading strategies more frequently followed by pre-reading strategies and post-reading strategies. An explanation why FL learners use while-reading strategies more frequently is that they may be more concerned with the actual reading act than with preparing for it or reflecting on it. Meanwhile, the use of pre and post-reading strategies does not seem to be as spontaneous and automatic as the use of while-reading strategies, i.e., learners need to be trained on the use of pre and post-reading strategies.

Students with high reading motivation (extrinsic, intrinsic, and efficacy) used all reading strategy categories more frequently. This finding converges with previous research reporting that extrinsic and intrinsic motivation and reading

efficacy positively correlate with EFL reading strategy use (Alsuhaibani, 2019; Wang et al., 2020; Han, 2021; Altumigah & Alkhaleefah, 2022; Mohammed, 2022). It also concurs with the studies of Dison and Shah (2020) and Meniado (2016) where a single composite measure comprising intrinsic and extrinsic reading motivation correlated positively with reading strategy use. It is reasonable that highly motivated learners use more reading strategies in the three stages of reading, as motivation drives learners to use all tools at their disposal, including reading strategies to improve their reading ability.

Reading strategy use was positively predicted by extrinsic motivation, reading efficacy, and intrinsic motivation respectively. The best predictor of reading strategy use was extrinsic motivation, followed by reading efficacy. Each of them predicted all strategy categories except for one category, with extrinsic motivation failing to predict only pre-reading strategies and reading efficacy failing to predict only post-reading strategies. Both of them predicted a large proportion of variance in while-reading strategies (30.4%). This finding is aligned with previous research reporting the positive impact of the extrinsic, intrinsic and efficacy factors on strategy use in FL reading (Shang, 2010; Meniado, 2016; Dison & Shah, 2020; Wang et al., 2020; Han, 2021; Mohammed, 2022). It seems that intrinsic motivation is more influential in L1 reading, while extrinsic motivation is more influential in FL reading. This seems reasonable, as students in the FL setting use the FL only in educational settings and thus do not have the same amount of reading as students in the L1 setting. Furthermore, students in the L1 setting may use reading as a pastime, while students in the FL setting may not read in English unless they have to. That is, the instrumental view of reading is more evident in FL settings.

Students with high reading motivation (extrinsic, intrinsic, and efficacy) were found to have better reading comprehension. This finding is not aligned with some previous studies (Ölmez, 2016; Dhanapala & Hirakawa, 2016; Meniado, 2016). It is nonetheless partly or completely congruent with other studies (e.g., Dhanapala, 2009; Han, 2021; Li & Gan, 2022). A possible explanation for these mixed results is that the relative significance of intrinsic and extrinsic motivation is culture-bound, with students in different cultures reading for intrinsic, extrinsic, or both intrinsic and extrinsic reasons. Reading efficacy has been generally found to correlate positively with reading comprehension in several EFL settings, e.g., Iran (Ghabdian & Ghafournia, 2016; Zarei, 2018), Turkey (Tercanlioglu, 2002), Indonesia (Fitri et al., 2019), Malaysia (Habibian & Roslan, 2014), Saudi Arabia (Mohammed, 2022), and Thai (Oranpattanachai, 2023).

The best predictor of reading comprehension was extrinsic motivation, followed by reading efficacy. Intrinsic motivation failed to predict reading comprehension. Again, this indicates that extrinsic motivation had a more significant impact on the participants' reading comprehension than intrinsic motivation. Also, students with high reading efficacy had better reading comprehension than students with moderate reading efficacy. Efficacy perceptions determine the effort the individuals expend to achieve their goals and their willingness to persist in the face of failure (Bandura, 1994). It is reasonable that highly motivated learners use more reading strategies in the three stages of reading, as motivation drives learners to use all tools at their disposal, including reading strategies to improve their reading ability.

Overall reading strategy use and the use of individual reading strategy categories correlated positively with reading comprehension. Students who used pre-reading, while-reading, and post-reading strategies more frequently had better reading comprehension. This finding is congruent with some previous studies (e.g., Phakiti, 2003; Zhang & Seepho, 2013; Abbasian & Hartoonian, 2014; Islam, 2018; Zarei, 2018; Han, 2021; Mohammed, 2022; Oranpattanachai, 2023) and incongruent with other studies (e.g., Shang, 2010; Meniado, 2016; Sari, 2016; Alsamadani, 2022; Zhang & Sukying, 2022). This finding is also in line with previous studies where direct instruction of different reading strategy categories proved effective in enhancing EFL learners' reading achievement (Azizifar et al., 2015; Han & Choi, 2018; Li et al., 2022).

Only while-reading strategies positively predicted students' reading comprehension. This finding is consistent with previous research reporting reading strategy use as a significant predictor of reading comprehension in FL reading (Zarei, 2018; Zhang & Seepho, 2013). However, it is inconsistent with a study conducted on Arab university EFL students in three Saudi universities (Alsamadani, 2022). In this study, none of the reading strategies (planning, attending and evaluating) predicted students' reading comprehension. However, in another study (Mohammed, 2022) conducted on a sample of Saudi university EFL learners comparable to the sample in the current study and in Alsamadani's study, reading strategies (global, problem-solving, and support strategies) predicted students' reading comprehension. Students are more likely to attain good levels of reading comprehension by using reading strategies before, during and after reading. By so doing, they imitate reading with active minds, facilitate and aid their reading comprehension, and reflect on their reading to be better readers the next time they read (Paris et al., 1996). Language ability remains the dominant contributor in reading performance, but this does not mean that reading strategy use does not play a significant role in reading performance (Bachman, 1990).

Finally, when all motivation and strategy factors were entered in the regression analysis as predictors of reading comprehension, while-reading strategies alone positively contributed to reading comprehension with 11.5%. While-reading strategies and reading efficacy positively contributed to reading comprehension with 14.5%. While-reading strategies, reading efficacy, and extrinsic motivation positively contributed to reading comprehension with about 16%.

That is, students' reading comprehension was significantly and positively affected by their while-reading strategies, reading efficacy, and extrinsic motivation.

VII. IMPLICATIONS

Students used pre and post-reading strategies less frequently than while-reading strategies. A possible reason for this is that the use of pre and post-reading strategies is not as spontaneous and automatic as while-reading strategies. This indicates that teachers should raise students' awareness and train them on strategies used before and after reading. This study and several other previous studies showed that these two types of reading strategies contribute significantly to reading comprehension. Furthermore, students' intrinsic reading motivation did not contribute to their reading comprehension. Teachers are thus recommended to enhance their students' intrinsic reading motivation, so it becomes more influential in their EFL reading. This can be achieved by considering students' interests in reading material selection. Teachers should also encourage students to read more for pleasure, e.g., students can be rewarded by getting extra marks if they prove that they have done extensive reading on their own.

VIII. SUGGESTIONS FOR FURTHER RESEARCH

Based on this study's findings, further research is needed to explore students' perceptions of pre and post-reading strategies. The reasons why reading intrinsic motivation is not influential in Saudi university students' EFL reading need to be explored. There is a need to conduct intervention studies to enhance Saudi university students' EFL intrinsic reading motivation. Identifying Saudi university students' EFL reading motivation and reading efficacy sources through qualitative research tools will be a valuable research endeavor. Finally, researchers may need to examine the effect of other important variables on Saudi university students' EFL reading strategy use and reading comprehension, e.g., autonomy, ideal L2 self, vocabulary knowledge, bottom-up and top-down text processing, and reading amount.

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