Associations between Learners' Online Reading Engagement, Reading Comprehension, and Reading Motivation

Abstract

The advent of advanced technological platforms has brought about transformations in readers' comprehension dynamics in online learning environments. Although abundant research has probed into the relationships between engagement, reading comprehension, and reading motivation in reading printed texts, exploring the interrelationships between online reading engagement (ORE), reading comprehension, and reading motivation remains scarce. Accordingly, this study examined associations between EFL learners' ORE, reading comprehension, and reading motivation. The participants comprised 311 EFL learners who were selected based on their performance on the Preliminary English Test (PET). The instruments included a reading comprehension test, ORE scale, and reading motivation questionnaire. The results of the parametric Pearson correlation indicated a significantly positive and large relationship between ORE and reading comprehension. Moreover, the results revealed a statistically positive, significant, and large relationship between ORE and reading motivation. Additionally, the findings suggest that fostering both cognitive and emotional aspects of online reading engagement can enhance learners' overall reading performance and motivation, emphasizing the need for instructional strategies that cater to these dimensions. The results are discussed, and implications for language teaching and learning are provided.

Keywords: Engagement, Online Reading Engagement, Reading Comprehension, Reading Engagement, Reading Motivation

1. Introduction

The new technological breakthroughs in the digital era have brought about transformations in reading, especially when it comes to EFL contexts (Al-Obaydi et al., 2024; Zhao & Abidin, 2024). Particularly, the expansion of online reading platforms has paved the way for the introduction of new dynamics regarding how learners interact with online texts, figure out content, and become motivated to read (An, 2023; Ghavamnia & Kashkouli, 2022; Shutaleva et al., 2023). The studies on reading engagement are deemed a crucial field of investigation, given that the new findings signal important pedagogical implications for enhancing reading comprehension (Guthrie, 2008;

Steenberg et al., 2021; Unrau & Quirk, 2014). One of the important constructs in the realm of advanced technology is online reading engagement, which is comprised of several dimensions influencing learners' interaction with digital texts (Izati et al., 2021). In a study, Miri et al. (2024) introduced six components related to Online Reading Engagement (LORE), namely affective, behavioral, cognitive, linguistic, agentic, and social. These components are indicative of the multifaceted nature of engagement, signaling that such an engagement involves more than the mere act of reading; instead, it is concerned with emotional responses, cognitive processes, and social interactions (Daher et al., 2021; Miri et al., 2024). Accordingly, it is important to shed light on how these dimensions interact with reading comprehension as teachers can draw on these insights to enhance effective online learning environments, resulting in the improvement of reading comprehension and motivation.

As the related literature affirms, reading comprehension has proved to be an essential skill for both academic success and lifelong learning (Adora et al., 2024; Cahulugan et al., 2024). Understating a text requires both decoding words and making sense of the text by using multiple cognitive strategies (Duncan et al., 2016). Indeed, reading comprehension can be very challenging for EFL learners, given the language difficulties and varying levels of proficiency (Fecteau, 1999; Li & Clariana, 2019). The new findings associated with online reading in English Language Teaching (ELT) contexts (e.g., Ahmed et al., 2022; Patra et al., 2022; Tümen Akyıldız & Çelik, 2022; Wang et al., 2021) reveal that a large proportion of reading among EFL learners occurs online using digital devices, including computers and mobile phones. As a result, investigating the possible relationship between ORE and reading comprehension is warranted. Indeed, shedding light on such relationships is even more important as previous research has shown a correlation between higher levels of engagement in online reading and enhanced comprehension skills (Naumann, 2015; Setyosari et al., 2021), suggesting that improved engagement can serve as a viable strategy for fostering EFL learners' comprehension.

Reading motivation has to do with a learner's personal aims, needs, and beliefs regarding the subjects, procedures, and outcomes of reading (Guthrie & Wigfield, 2000). In fact, reading motivation makes a notable contribution to improving engagement and comprehension. Similarly, Unrau and Quirk (2014) placed emphasis on the relationship between reading motivation and engagement, asserting that individuals with strong motivation are more likely to have deep engagement with texts, particularly in relation to EFL contexts where learners grapple with

additional challenges. These challenges are likely to reduce learners' reading motivation. According to Gao (2023), improving reading motivation by introducing learners to engaging online content may result in an increase in student engagement and improved learning outcomes. Therefore, examining the correlation between ORE and reading motivation among Iranian EFL learners can yield important evidence for the development of effective instructional strategies. Moreover, given the increasing growth of digital literacy in today's educational contexts, decoding the way in which learners engage with online texts paves the way for the development of effective pedagogical practices. In the same vein, Ciampa (2012) noted that structured online reading programs go a long way to improving learners' engagement and strategic use of comprehension strategies. Research findings attest to the potential targeted interventions aimed at leveraging technology to support EFL learners in fostering critical reading skills.

Along the same lines, this study seeks to examine the relationship between online reading engagement (ORE), reading comprehension, and reading motivation among Iranian EFL learners. This study is important given the growing applications of digital resources in educational settings, entailing an in-depth understanding of the ways in which these resources can be used to maximize reading outcomes. Indeed, shedding light on these associations contributes to the increasing body of literature on online reading in EFL contexts, providing hands-on recommendations for improving learner engagement and reading comprehension through effective online reading practices. Given the evolving trend of education in response to technological advancements, research findings on these relationships are essential for improving successful learning experiences in various educational settings in general and EFL contexts in particular.

2. Literature Review

2.1. Online Reading Engagement

As a multifaceted construct, reading engagement consists of several dimensions related to the reader's interaction with texts. As pointed out by Unrau and Quirk (2014), reading engagement is characterized as the extent to which readers are involved in reading. This includes several aspects, such as emotional, cognitive, and behavioral responses to texts. Also, Wigfield et al. (2008) expand this definition by asserting that reading engagement serves as a mediating factor that moderates the impacts of the teaching of reading comprehension on reading outcomes, lending support to its critical role in educational contexts. Moreover, Ellis and Coddington (2013) elaborate on the role

of reading engagement in relation to children's literacy, suggesting that such engagement entails both the very act of reading and the motivation and interest that push the individual to engage with texts. Several components make up the concept of reading engagement. For instance, Hamedi et al. (2020) discuss emotional aspects as essential for figuring out how engagement makes a contribution to reading comprehension. They note that positive emotions related to reading can improve engagement levels, which, in turn, leads to increased comprehension. Lin et al. (2021) investigated the potential correlations between secondary school students' reading engagement and their comprehension, concluding that there is a positive correlation between higher levels of engagement and better comprehension.

Given the global use of digital technology, there has been a growing focus on online reading engagement, which is concerned with learners' interaction with texts in digital formats. In this context, Naumann (2015) put forth a model of online reading engagement that makes a connection between engagement, navigation, and performance in digital reading contexts. The model attaches enormous importance to figuring out the way in which learners navigate online texts, as well as the way in which this navigation influences their overall engagement and comprehension. Moreover, Miri et al. (2024) identified six components of Online Reading Engagement (ORE), including affective, behavioral, cognitive, linguistic, agentic, and social dimensions. These components constitute a comprehensive framework aimed at analyzing learners' engagement with texts. This framework reveals that online reading engagement involves both reading and a complex interplay of various factors.

Huo and Cho (2020) elaborate in more detail on the contribution of metacognitive strategies to improving online reading engagement. The findings provided by their study show that learners using metacognitive strategies are more likely to engage in-depth with digital texts. It follows that the instruction of these strategies can improve online reading experiences, which is reflected by findings by Izati et al. (2021), who investigated digital reading engagement among junior high school students in an online learning context. The results showed that effective engagement strategies had a notable effect on enhancing students' motivation and comprehension. In addition to cognitive strategies, individual differences were found to influence online reading engagement. In an investigation, Lee and Wu (2012) examined the effect of both intrinsic and extrinsic factors on engagement in online reading tasks. They concluded that personal characteristics, including previous knowledge and motivation level, significantly influence the

way in which learners engage in interaction with digital texts. The studies have also targeted the relationship between online reading engagement and reading motivation. Gao (2023) elaborates on the necessity of enhancing reading motivation through using appealing, engaging online content, suggesting that motivated individuals are more likely to take part actively in digital reading tasks. This is especially important in EFL contexts where learners grapple with several challenges that can reduce their reading motivation.

2.2. Online Reading and Reading Comprehension

Reading comprehension is deemed an essential skill that requires the reader to figure out, make sense, and analyze written texts. Should one intend to engage with communities in the 21st century, he/she needs to know how to read online content. Indeed, such mastery over online reading is an important prerequisite for participation in online interactions (Rimi, 2019). Accordingly, as pointed out by Zhang et al. (2013), people need to possess online reading skills so as to be able to successfully make use of information communication technologies (ICTs) in their lives. Snow and Matthews (2016) assert that reading comprehension involves a process whereby meaning is extracted and constructed simultaneously through interaction and involvement with written language. This refers to the interactive aspect of reading comprehension, which involves readers' active engagement with the text to extract meaning. Based on another perspective, reading comprehension requires the individual's ability to interpret text by combining prior knowledge with new information provided by the text (Kintsch, 1998). Such a focus on interaction and integration signals the complex nature of reading comprehension as a cognitive process. Online reading has to do with the very act of reading digital texts on the internet. Leu et al. (2007) characterize online reading as the reading process in a networked context, putting emphasis on the distinct aspects that distinguish it from conventional reading methods. Based on this definition, online reading is an activity that entails searching through hypertextual information. This often requires readers to make use of multiple strategies and skills, which are lacking in conventional print reading. In the same vein, Jose (2021) delineates this definition by characterizing online reading as a dynamic process that requires readers to comprehend, evaluate, and synthesize information from multiple sources. These distinctions between conventional reading and online reading can provide important insights for comprehension. Traditional reading has to do with linear text formats, with readers moving forward through a text from beginning to end. This format

makes it possible for readers to have a more focused engagement with the material, given that readers are able to immerse themselves in a single narrative or argument without distractions. However, in the case of online reading, readers often navigate hypertext environments that contain hyperlinks, electronic elements, and varying layouts (Tseng, 2010). Such a non-linear structure poses some challenges to readers' attention and comprehension as they need to deal with several sources of information at the same time. A study conducted by Tseng (2008) showed that EFL learners can better understand texts that contain hypertext compared to traditional printed texts, suggesting that online reading requires the readers to use distinct cognitive strategies for effective understanding.

A review of the literature reveals that the strategies used by learners during online reading have a notable effect on comprehension outcomes. For example, Anggraini et al. (2022) investigated the interactive impact of reading proficiency and personality types on online reading strategy use among EFL students in a higher education institute. The study showed that highly proficient learners can better use effective online reading strategies than other learners, resulting in improved comprehension. In the same vein, Park and Kim (2011) managed to identify specific strategies used by ESL learners while proceeding with their online reading tasks. This finding implies that it is necessary to instruct these strategies with the aim of enhancing comprehension skills. Moreover, research has shown that metacognitive strategies contribute to online reading comprehension. For example, Rıanto (2022) studied the potential relationship between EFL students' use of metacognitive online reading strategy and comprehension, with the results showing the positive effects of higher metacognitive awareness on comprehension outcomes. This finding echoes Rianto's (2021) findings, which indicated the evolvement of metacognitive strategies used by EFL learners prior to and following the Covid-19 pandemic. This indicates that strategy use can be significantly influenced by context. Given the growing use of technology in education, the effectiveness of a wide range of instructional methods on reading comprehension has been the focus of many studies. Akbarı et al. (2021) conducted a comparative study examining virtual versus non-virtual teaching methods. They concluded that the instruction supported by technology significantly enhanced reading comprehension among Iranian undergraduate EFL students. Moreover, Alsuwat and Young (2016) carried out a meta-analysis whose results showed the contribution of technology-based instruction to better comprehension outcomes, suggesting the measures teachers need to take to incorporate digital literacy skills.

2.3. Reading Motivation

As pointed out by Tovli (2014), the main constituent of reading motivation is interest in reading, which has to do with individuals' preference for reading over other activities, as well as the internal desire for reading. Also, the motivated reader always invests time and energy in reading. Conradi et al. (2014) defined reading motivation as a construct that is composed of intrinsic and extrinsic factors that drive people to read. Indeed, such a definition of reading motivation signals the multifaceted nature of such a kind of motivation. Schiefele et al. (2012) gave a detailed discussion of this concept, characterizing reading motivation as a concept that involves a combination of personal interest in reading as well as the perceived value of reading activities. Such definitions signal the complex nature of reading motivation, which is comprised of both internal desires and external influences.

The literature provides consistent evidence regarding the significant relationship between reading motivation, reading behavior, and competence. For example, Schaffner et al. (2013) concluded that intrinsic motivation from individual enjoyment and interest in reading- has a positive effect on the extent to which students engage in reading. This, in turn, improves comprehension competence. This relationship implies that enhanced intrinsic motivation can result in increased reading frequency, as well as improved academic outcomes.

As far as English as a Foreign Language (EFL) is concerned, Wang and Gan (2021) put forth a thorough reading motivation questionnaire aimed at measuring different dimensions of reading motivation among EFL learners. They showed that motivational aspects, including self-efficacy and intrinsic interest, can predict reading engagement in a foreign language setting. This shows that teachers need to take into account cultural and contextual aspects while focusing on reading motivation in different learning contexts. Also, Anwar and Arianto (2023) examined the possible relationship between reading motivation, enthusiasm, and reading comprehension among EFL undergraduate students. Their investigation showed the relationship between higher levels of reading motivation and their interest in reading, with reading motivation enhancing comprehension abilities. This mirrors the findings of a study conducted by Patra et al. (2022), who investigated the impact of e-learning on EFL learners' reading comprehension and motivation. Their research

showed that e-learning platforms improve reading motivation by providing engaging and interactive content, paving the way for the creation of a conducive learning environment.

Shedding light on the interaction between intrinsic and extrinsic motivational factors can lead to a better understanding of reading motivation. To this end, Schiefele et al. (2012) introduced multiple dimensions of reading motivation, which can be categorized into two main groups, namely, intrinsic goals (e.g., relishing reading) and extrinsic goals (e.g., gaining rewards or recognition). Talwar et al. (2023) conducted a study to find out about the way in which these motivational dimensions affect early academic success in college, concluding that intrinsically motivated students show better reading literacy skills. As a result, enhanced intrinsic motivation can bring about more benefits regarding long-term academic achievement than relying solely on extrinsic rewards. The contribution of well-being to reading motivation has also caught the attention of researchers. For example, Vaknin-Nusbaum and Tuckwiller (2023) investigated the relationship between reading motivation, well-being, and reading achievement among second-grade students. The results showed that the learners with higher levels of reading motivation outperform other learners academically, reporting greater overall well-being. This indicates the benefits education stakeholders can reap by improving a positive reading culture within educational settings where students are highly motivated to read for pleasure as well as for academic purposes.

Although substantial research has been conducted on reading motivation, there are still gaps in our understanding of how diverse educational environments shape motivational dynamics. For example, while investigations like those of Wang and Gan (2021) and Anwar and Arianto (2023) shed light on EFL contexts, further study is required to examine how variables such as reading engagement connect to reading motivation across different learning settings, particularly in online education. As teaching methodologies continue to evolve, especially in digital spaces, sustained research into effective methods for boosting reading motivation remains crucial. Thus, this study aimed to explore the associations between learners' online reading engagement, reading comprehension, and reading motivation. In so doing, the following research questions were formulated:

1. Is there any significant relationship between Iranian EFL learners' ORE and reading comprehension?

2. Which one of the components of LORE best predicts Iranian EFL learners' reading comprehension?
3. Is there any significant relationship between Iranian EFL learners' ORE and reading motivation?
4. Which one of the components of LORE best predicts Iranian EFL learners' reading motivation?

3. Methodology

3.1. Participants

The initial participants, selected based on convenience sampling, consisted of 515 Iranian EFL learners studying English at the intermediate proficiency level at 10 language institutes located across the country. They were within the age range of 18 to 50 and from both male (232) and female (183) learners. These learners were given a Preliminary English Test (PET), and based on the results, 335 were chosen.

3.2. Instruments

3.2.1. Preliminary English Test (PET)

In this study, the homogeneity of the participants in terms of language proficiency was assured using PET. This test targets the intermediate level and is comprised of 4 parts, assessing all 4 skills i.e., speaking, writing, reading, and listening. The test takers need to complete the test within two hours. The reading part is made up of 35 questions presented in several formats, including multiple-choice, matching, and true-false items. As for the writing part, test takers initially should complete some incomplete sentences. This was followed by the presentation of information in the form of a postcard, note, or email, about which the test takers were expected to write a 35-word paragraph. The test takers were provided with two different topics, and they could opt for either of them to write 100 words. The participants' writing performance was assessed using the writing rating scale provided by PET. The listening part is comprised of 4 sections, which are made up of 25 multiple-choice questions. This part should be completed within 30 minutes. As far as the listening section is concerned, test takers were supposed to listen to a series of short recordings and choose the best alternative corresponding to the respective recording. The speaking part involved an interview that lasted 10 minutes, with the participants supposed to take part in conversations. They exchanged questions and answers, engaging in a free chat about their likes

and dislikes. The scores on this part were computed using a PET speaking rating scale. The overall score obtained by each candidate was a sum of all marks earned on each part. The breakdown of the overall scores is as follows: reading and writing parts (50%) and the listening and speaking parts (25%). An initial sample of 515 students took the PET, and the learners who obtained scores ranging from +/- one standard deviation from the mean were selected.

3.2.2. Reading Comprehension Test

The scores of the reading comprehension of PET administered for homogeneity purposes were used as the reading comprehension scores.

3.2.3. Online Reading Engagement Scale (ORES)

To measure ORE in this study, the ORES developed and validated by Miri et al. (2024) was used. The scale contains 21 items on a five-point Likert scale, which measure ORE on six factors consisting of Affective (4 items), Behavioral (4 items), Cognitive (4 items), Linguistic (3 items), Agentic (3 items), and Social (3 items). Miri et al. reported acceptable psychometric properties for the whole scale (Alpha= .81) and its different dimensions.

3.2.4. Reading Motivation Questionnaire

The instrument used for measuring reading motivation was a questionnaire consisting of 25 items on a 5-point Likert scale assessing the five components of reading motivation, including reading efficacy (7 items), reading enjoyment (7 items), recognition (4 items), involvement (4 items), and compliance (3 items). Wang and Gan (2021) carried out exploratory and confirmatory factor analyses and reported strong psychometric properties for the instrument. The Cronbach's Alpha index computed for this instrument in the present study was .87, which is considered satisfactory.

3.3. Procedure

Firstly, PET was given to 515 Iranian EFL learners studying English at the intermediate level at 10 English language institutes. Based on the scores, a homogenized sample of participants whose scores fell within the range of +/- one standard deviation from the mean were selected. Based on the results, 335 learners were selected as the homogenized sample in terms of overall language proficiency. To address ethical considerations, learners were given a consent form to fill out. In

the consent form, they were informed that their participation in the present study was voluntary and that they could withdraw from the study at any stage of data collection. They were also told that the collected data would only be used for research purposes and kept confidential with the researcher. Following that, the participants were given the ORES and the reading motivation questionnaire to probe into the relationships between reading motivation, reading comprehension, and ORE. Out of the 335 participants, 311 completed and returned both questionnaires.

4. Results

4.1. Addressing the First Research Question

To explore any significant relationship between Iranian EFL learners' ORE and reading comprehension, initially it deemed necessary to check the normality assumption in order to select the parametric or non-parametric statistical test for running the legitimate correlation coefficient statistical test. Table 1 displays the results of descriptive statistics and kurtosis and skewness values for the total ORES and reading comprehension test scores.

Table 1

Descriptive Statistics and Kurtosis and Skewness Values for the Total ORE and Reading Comprehension Test Scores

	N	Range	Minimum	Maximum	Mean	Variance	Skewness		Kurtosis	
								Std.		Std.
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Error	Statistic	Error
Total ORE	311	46.00	43.00	89.00	64.3055	68.084	.293	.138	-.218	.276
Reading	311	20.00	11.00	31.00	21.4341	16.124	-.413	.138	.049	.276

As evident in the table above, the skewness and ratio values for the two data sets are within the range of +/- 1.96, which indicates that the normality assumption is met (Pallant, 2020). Therefore, Pearson correlation was used to explore any statistically significant relationship between Iranian EFL learners' ORE and reading comprehension. Table 2 portrays the respective results.

Table 2

Pearson Correlation for the Total ORE and Reading Comprehension Test Scores

		Total ORE	Reading
Reading	Pearson Correlation	.623**	1

	Sig. (2-tailed)	.000	
	N	311	311

**. Correlation is significant at the 0.01 level (2-tailed).

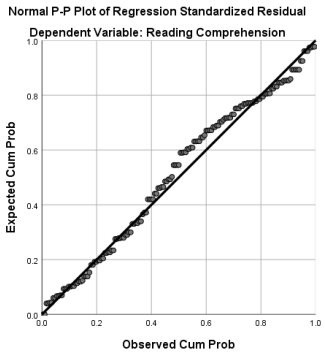
Based on the results shown in Table 2, there is a statistically positive and significant relationship between total ORES and reading comprehension test scores (r = .623, n = 311, p = .00<0.01). According to Cohen (1988, pp. 79-81), the strength of relationship is interpreted as small when "r= .10 to .29", medium when "r= .30 to .49" and large when "r= .50 to 1.00". Therefore, since the "r" index turned out to be .62 which is positively significant at the level of .01, it can be inferred that the correlation coefficient between ORE and reading comprehension is significant, positive, and large.

4.2. Addressing the Second Research Question

To examine the component of LORE which best predicts Iranian EFL learners' reading comprehension, multiple linear regression was performed. There are several assumptions which need to be checked for multiple regression including multicollinearity, normality, outliers, linearity, homoscedasticity, and independence of residuals (Pallant, 2010). VIF index was consulted to check the multicollinearity assumption. As Table 5 shows, VIF values are all lower than 10 indicating that the multicollinearity assumption is met. According to Pallant (2010), normality, linearity, homoscedasticity, and independence of residuals assumptions can be checked by using the Normal Probability Plot (P-P) of the Regression Standardized Residual and the Scatterplot. Normal Probability Plot (P-P) of the Regression Standardized Residual and the Scatterplot for the ORE components and reading comprehension scores are shown in Figures 1 and 2, respectively.

Figure 1.

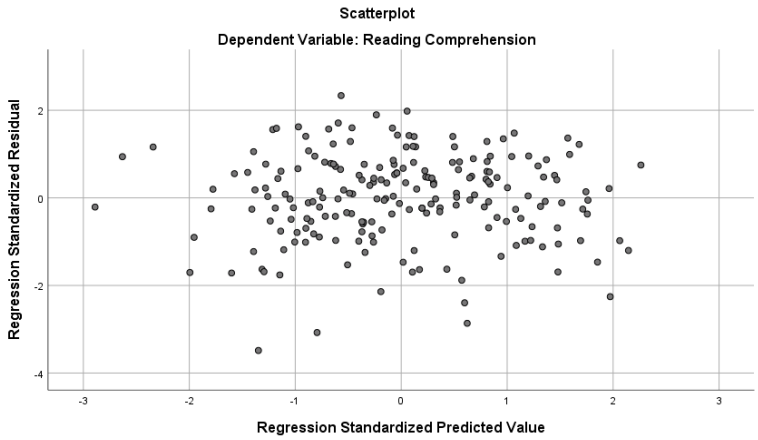
Normal Probability Plot (P-P) of the Regression Standardized Residual with ORE Components as the Predictors and Reading Comprehension as the Dependent Variable



As Figure 1 shows, all the dots are in a diagonal line from bottom left to top right which is an indication of normal data for multiple regression analysis (Pallant, 2010).

Figure 2.

Scatter Plot with ORE Components as the Predictors and Reading Comprehension as the Dependent Variable



As revealed in Figure 2, the points are scattered in a rectangular shape, which suggests no violation of linearity, homoscedasticity, and independence of residuals assumptions (Pallant, 2010). Having established the assumptions of multiple regression, the actual analysis was performed to explore if the components of LORE significantly predict Iranian EFL learners' reading comprehension. Table 3 demonstrates the results of ANOVA for the regression model with ORE components as the predictors and reading comprehension as the dependent variable.

Table 3

ANOVA of the Regression Model with ORE Components as the Predictors and Reading Comprehension as the Dependent Variable

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1490.684	6	248.447	21.532	.000b
	Residual	3507.715	304	11.539		
	Total	4998.399	310			

a. Dependent Variable: Reading

b. Predictors: (Constant), Social E, Cognitive E, Behavioral E, Linguistic E, Agentic E, Affective E

As shown in Table 3, the model signifies that ORE components can significantly predict reading comprehension since the F value was significant (F (6,310) =21.53, p=0.00 < 0.05). To unravel the extent to which ORE components can significantly predict reading comprehension, the model summary and coefficient tables of regression were consulted. Table 4 shows the model summary of regression analysis with ORE components as the predictors and reading comprehension as the dependent variable.

Table 4

Model Summary of Regression Analysis with ORE Components as the Predictors and Reading Comprehension as the Dependent Variable

Model Summaryb

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.546a	.298	.284	3.39684

a. Predictors: (Constant), Social E, Cognitive E, Behavioral E, Linguistic E, Agentic E, Affective E

b. Dependent Variable: Reading

As revealed in Table 4, as a whole ORE explained about .29% of the variance in the dependent variable (reading comprehension). In other words, the ORE scores made a .29% contribution to explaining the variance in reading comprehension. To uncover which one of the components was the best predictor, Beta value was employed. Table 5 shows the coefficient values including Beta value with ORE components as the predictors and reading comprehension as the dependent variable.

Table 5

Coefficient Values with ORE Components as the Predictors and Reading Comprehension as the Dependent Variable

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	4.689	1.507		3.112	.002					
	Affective E	.180	.043	.203	4.138	.000	.180	.231	.199	.955	1.047
	Behavioral E	.184	.048	.188	3.848	.000	.215	.216	.185	.969	1.032
	Cognitive E	.348	.055	**.305**	6.273	.000	.283	.339	.301	.976	1.024
	Linguistic E	.283	.065	.211	4.368	.000	.217	.243	.210	.989	1.011
	Agentic E	.378	.089	.205	4.246	.000	.254	.237	.204	.987	1.013
	Social E	.270	.074	.178	3.673	.000	.208	.206	.176	.986	1.015

a. Dependent Variable: Reading

As indicated in the above table, the Beta value for the cognitive dimension turned out to be .305 which is significant at .00 and is larger than the corresponding Beta values for the remaining components of ORE. Accordingly, it can be concluded that the cognitive component of ORE is the best predictor of reading comprehension.

4.3. Addressing the Third Research Question

The third research question examined any statistically significant relationship between Iranian EFL learners' ORE and reading motivation. Table 6 demonstrates the results of descriptive statistics and kurtosis and skewness values for the total ORE and reading motivation.

Table 6

Descriptive Statistics and Kurtosis and Skewness Values for the Total ORE and Reading Motivation

	N	Range	Minimum	Maximum	Mean	Variance	Skewness	Kurtosis

								Std.		Std.
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Error	Statistic	Error
Total ORE	311	46.00	43.00	89.00	64.3055	68.084	.193	.138	-.218	.276
Reading Motivation	311	70.00	32.00	102.00	74.8392	104.632	-.159	.138	.268	.276

Since the skewness and ratio values for the two data sets are within the range of +/- 1.96, Pearson correlation was performed to examine any statistically significant relationship between Iranian EFL learners' ORE and reading motivation, the results of which are displayed in Table 7.

Table 7

Pearson Correlation for the Total ORE and Reading Motivation

Correlations			
		Total ORE	Reading Motivation
Total ORE	Pearson Correlation	1	.697**
	Sig. (2-tailed)		.000
	N	311	311

**. Correlation is significant at the 0.01 level (2-tailed).

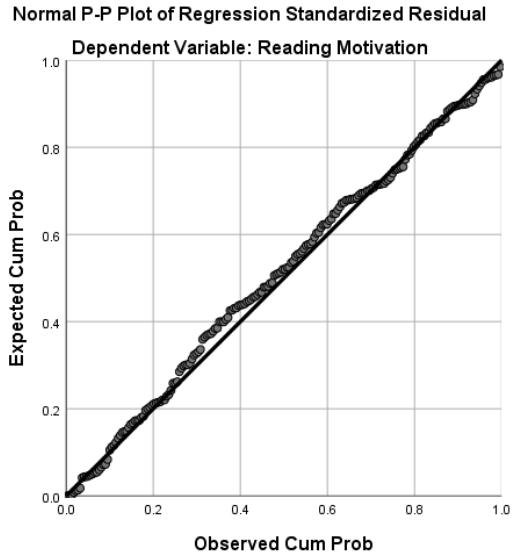
As seen in Table 7, there is a statistically positive and significant relationship between total ORE and reading motivation (r = .697, n = 311, p = .00<0.01), which signifies a large correlation coefficient index (Cohen, 1988, pp. 79-81).

4.4. Addressing the Fourth Research Question

The fourth research question aimed to uncover the component of LORE that best predicts Iranian EFL learners' reading motivation. VIF values were checked to inspect the multicollinearity assumption. As seen in Table 10, all the VIF values are lower than 10, indicating that the multicollinearity assumption is not violated. Figures 3 and 4 demonstrate the Normal Probability Plot (P-P) of the Regression Standardized Residual and the Scatterplot for the ORE components and reading motivation scores, respectively.

Figure 3.

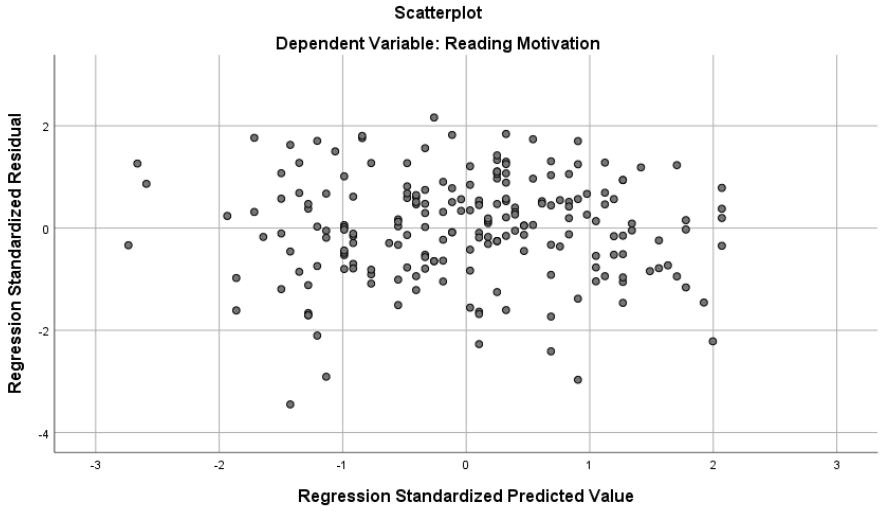
Normal Probability Plot (P-P) of the Regression Standardized Residual with ORE Components as the Predictors and Reading Motivation as the Dependent Variable



As indicated in Figure 3, all the dots are in a diagonal line from bottom left to top right which is an indication of normal data for multiple regression analysis (Pallant, 2010).

Figure 4.

Scatter Plot with ORE Components as the Predictors and Reading Motivation as the Dependent Variable



As Figure 2 portrays, the points are scattered in a rectangular shape, which suggests no violation of linearity, homoscedasticity, and independence of residual assumptions (Pallant, 2010). Table 8 presents the results of ANOVA for the regression model with ORE components as the predictors and reading motivation as the dependent variable.

Table 8

ANOVA of the Regression Model with ORE Components as the Predictors and Reading Motivation as the Dependent Variable

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14775.759	6	2462.627	42.391	.000b
	Residual	17660.202	304	58.093		
	Total	32435.961	310			

a. Dependent Variable: Reading Motivation

b. Predictors: (Constant), Social E, Cognitive E, Behavioral E, Linguistic E, Agentic E, Affective E

As seen in Table 8, the model reveals that ORE components can significantly predict reading motivation since the F value was significant (F (6,310) = 42.391, p=0.00 < 0.05). To unravel the extent to which ORE components can significantly predict reading motivation, the model summary and coefficient tables of regression were checked. Table 9 illustrates the model summary of regression analysis with ORE components as the predictors and reading motivation as the dependent variable.

Table 9

Model Summary of Regression Analysis with ORE Components as the Predictors and Reading Motivation as the Dependent Variable

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.675a	.456	.445	7.62186

a. Predictors: (Constant), Social E, Cognitive E, Behavioral E, Linguistic E, Agentic E, Affective E

b. Dependent Variable: Reading Motivation

Based on the information in Table 9, ORE explained that .45% of the variance was in the dependent variable (reading motivation). In other words, the ORE scores made a .45% contribution to explaining the variance in reading motivation. Beta values were consulted to find which one of

the components was the best predictor. Table 10 demonstrates the coefficient values, including Beta values, with ORE components as the predictors and reading motivation as the dependent variable.

Table 10

Coefficient Values with ORE Components as the Predictors and Reading Motivation as the Dependent Variable

Coefficients											
		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	23.743	3.381		7.023	.000					
	Affective E	.972	.098	**.398**	6.804	.000	.298	.364	.288	.955	1.047
	Behavioral E	.921	.107	.349	9.037	.000	.426	.460	.382	.969	1.032
	Cognitive E	.904	.124	.311	7.272	.000	.267	.385	.308	.976	1.024
	Linguistic E	.716	.145	.209	4.922	.000	.203	.272	.208	.989	1.011
	Agentic E	.516	.200	.110	2.583	.010	.173	.147	.109	.987	1.013
	Social E	.881	.165	.227	5.335	.000	.253	.293	.226	.986	1.015

a. Dependent Variable: Reading Motivation

As revealed in the above table, the Beta value for the affective dimension equaled .398 which is significant at .00 and is higher than the corresponding Beta values for the remaining components of ORE. Accordingly, it can be concluded that the affective component of ORE is the best predictor of reading motivation.

5. Discussion

This study aimed to explore the associations between learners' online reading engagement, reading comprehension, and reading motivation. The results of the statistical analysis indicated that there was a significant positive and large relationship between ORE and reading comprehension. Moreover, it was found that the cognitive component of ORE was the best predictor of reading

comprehension. Furthermore, the results revealed a statistically positive, significant, and large relationship between ORE and reading motivation. Ultimately, it was found that the affective component of ORE was the best predictor of reading motivation.

Some previous studies echo the findings of this study regarding the positive relationship between learners' ORE and reading comprehension. For example, Taboada et al. (2013) concluded that reading engagement has a mediating role in fostering the students' ability to figure out the text. This shows that it is crucial for students to be involved in reading activities should they be expected to be successful in reading comprehension. In the same vein, Lin et al. (2021) concluded that there is a positive correlation between Chinese students' higher levels of reading engagement and enhanced reading comprehension skills. These findings lend support to the current research's conclusion that ORE improves comprehension and promotes literacy skills. This study provided strong evidence for the essentiality of engagement as a component of the reading process. The contribution of online reading engagement to enhance reading comprehension can be attributed to two factors. 1- As pointed out by Naumann (2015), effective online reading engagement requires individuals to navigate digital texts using interactive features. This, in turn, can improve learners' cognitive processing, as well as their ability to retain information. The interactive nature of readers' encounter with digital content paves the way for the effective construction of meaning, resulting in a better comprehension outcome. 2- As a characteristic of online learning environments, enhanced engagement results in improved motivation, as well as interest in reading. These outcomes are crucial factors for successful comprehension. Indeed, learners' motivation and active engagement drive them to use effective reading strategies, paving the way for increased understanding and retention of the material presented (Setyosari et al., 2021). These positive implications signal the necessity of the integration of strategies aimed at enhancing ORE in educational settings to foster learners' comprehension abilities.

The evidence provided by this study that the cognitive aspect of online reading engagement (ORE) can best predict EFL learners' reading comprehension is mirrored by previous empirical studies. These studies affirm the essential role of cognitive processes in reading. The study conducted by Barber et al. (2016) revealed that cognitive engagement has a significant effect on reading outcomes among Spanish-speaking English learners. This lends support to the conclusion that effective cognitive involvement improves comprehension. Also, Rıanto (2022) showed that metacognitive online reading strategies are positively correlated with reading comprehension,

indicating that cognitive strategies play an essential role in achieving effective engagement with digital texts. Moreover, Miller (2015) showed that cognitive engagement, assessed through tracking eye movements and reading times, contributes greatly to figuring out digital content. Overall, these studies echo the present study's conclusion that cognitive engagement is of great importance and is of use for EFL learners' comprehension in online contexts.

The important contribution of cognitive engagement to improving reading comprehension can be explained as follows: According to Guthrie et al. (1999), cognitive engagement paves the way for effective information processing and retention, making it possible for learners to engage in constructing meaning from texts. In fact, EFL learners' active cognitive engagement with content enables them to put to use effective reading strategies, resulting in increased comprehension outcomes. Moreover, a study conducted by Ballenghein et al. (2020) revealed a correlation between cognitive engagement involved in online reading and enhanced focus and retention of information. This implies that cognitive engagement renders learners more attentive and more capable of navigating complex digital texts, leading to better comprehension (Jian, 2022; Ahmadi & Nasr, 2022). These findings are indicative of the essentiality of improving cognitive engagement in online reading environments with the aim of fostering EFL learners' comprehension skills.

Also, the evidence provided by this study regarding the strong positive relationship between EFL learners' online reading engagement and reading motivation corroborates the previous empirical studies. For example, Unrau and Quirk (2014) noted that reading motivation can serve as a predictor of reading engagement, indicating the serious efforts and investment made in reading activities. In the same vein, Ghavamnia and Kashkouli (2022) concluded that motivation has a significant effect on Iranian EFL learners' engagement and strategy use, lending support to the notion that motivation contributes to more engagement in reading practices. Moreover, Gao (2023) attached enormous importance to the contribution of contemporary literature to enhancing motivation and engagement in online learning settings. This shows that the digital context can reinforce these relationships. Overall, these studies are a testament to the present research's conclusion that improving reading motivation plays a pivotal role in fostering EFL learners' online reading engagement. Two reasons can be given for the importance of this relationship between online reading engagement and reading motivation. Vaknin Nusbaum and Tuckwiller (2023) asserted that highly motivated students are more likely to take part in reading activities eagerly,

resulting in in-depth engagement and better comprehension. Such a type of intrinsic motivation pushes students to navigate texts more thoroughly, enhancing their overall reading experience. Also, An (2023) notes that effective instructional programs pave the way for improving both motivation and engagement in EFL contexts, implying that teachers need to develop learning experiences in a strategic manner. This, in turn, increases interest in reading. By establishing a suitable environment that is conducive to exploration and curiosity, teachers foster students' motivation to engage with texts, thereby promoting their reading outcomes. These reasons underscore the need to address both motivation and engagement in the development of effective EFL reading programs.

This study found out that EFL learners' reading motivation can be predicted through the affective component of online reading engagement. This is also echoed by the previous empirical investigations that place emphasis on the importance of emotional responses in learning settings. For example, a study carried out by Cockroft (2016) attached great importance to the contribution of effective interventions to improving adolescents' reading motivation and engagement. Thus, it can be concluded that the individual's ability to respond emotionally to texts leads to a deeper commitment to reading. Also, the findings of a study conducted by Winberg et al. (2022) revealed a strong relationship between learners' affective experiences and their reading motivation, suggesting the contribution of positive emotional experiences associated with reading to enhanced motivation for engaging with texts. Along the same lines, List (2021) explored the cognitive-affective engagement model, concluding that emotional factors have a significant effect on learners' engagement levels and their reading motivation. Generally, these findings echo the present investigation's conclusion regarding the crucial role of affective engagement in increasing EFL learners' reading motivation. The important role of the affective component as a predictor of reading motivation can be accounted for in two ways: 1- as pointed out by Cho and Castañeda (2019), positive emotions can improve learners' intrinsic motivation, driving them to take part in reading activities more eagerly. This, in turn, fosters engagement and increases the learners' appreciation for reading as a valuable skill. 1- creating an emotionally supportive learning environment contributes to improving students' engagement, as shown by Winberg et al. (2022). In fact, learners' emotional connection to the material drives them to allocate time and effort to their reading practices. Focusing on the affective aspect of reading engagement, teachers are able

to establish a more motivating atmosphere that inspires EFL learners to study and enjoy reading in their language-learning journey.

6. Conclusion

The evidence provided by this study has practical implications for teachers and curriculum designers dealing with EFL learners in digital contexts. For example, the finding regarding the positive correlation between online reading engagement (ORE) and reading comprehension implies that teachers need to enhance online reading engagement as a priority in the instruction of strategies. They are recommended to use interactive digital platforms that improve learners 'cognitive engagement through a variety of activities, including quizzes, discussions, and multimedia resources, as these activities have proved to enhance deeper comprehension (Naumann, 2015; Setyosari et al., 2021). Moreover, as the cognitive aspect of such an engagement was found to predict reading comprehension, the integration of metacognitive strategies into online reading activities can increase learners' capability of processing and understanding texts (Rıanto, 2022). For example, the instruction on how to use self-monitoring techniques while reading results in increased comprehension (Miller, 2015). In addition, the evidence provided by this study regarding the capacity of the affective component of ORE in predicting reading motivation implies that an emotionally engaging reading experience is essential. Accordingly, teachers need to select texts that are appealing to students' interests and emotions, thereby increasing their intrinsic motivation to read (Guthrie et al., 1999; Gao, 2023). Overall, these insights can provide a blueprint for teachers to develop effective online reading programs aimed at improving comprehension and cultivating a lifelong interest in reading among EFL learners.

Prospective investigations can examine other understudied dimensions of online reading engagement and their effect on EFL learners. For example, they can investigate the potential impact of different types of digital texts, including interactive e-books, versus traditional PDFs, on several components of ORE, such as cognitive and affective engagement (Jian, 2022). Gaining insights into these dynamics enables teachers to tailor digital content with the aim of maximizing engagement and comprehension. Also, longitudinal investigations probing the long-term effects of sustained online reading engagement on language proficiency can yield important insights into the developmental trajectories of EFL learners (Lin et al., 2021). Moreover, researchers are recommended to explore the contribution of social interaction in online reading environments.

They could study the potential effect of collaborative reading activities on cognitive and affective engagement levels (Ballenghein et al., 2020). In addition, given the diverse range of learning styles of EFL learners, future studies need to investigate the way in which personalized learning pathways in digital reading contexts influence engagement and motivation (An, 2023). Such studies would yield new insights into the interplay between technology, engagement, and language learning outcomes in EFL contexts.

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