

Exploring the Interplay of Metacognitive Awareness and Reading Proficiency: A Study among Moroccan University EFL Students

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Abstract

In recent years, there has been a considerable interest in metacognition and language learning research. An ever-increasing body of literature shares the consensus that metacognitive knowledge plays a critical role in the process of language learning. While metacognitive knowledge encapsulates being cognizant of one's own language level and the learning strategies available to improve this level, the absence of such an awareness brings about serious challenges that hinder the process of language learning. In light of such a hiatus, the present study attempts to examine the relationship between EFL university students' reading proficiency in English and their metacognitive awareness of reading strategies. In order to achieve this objective, Data were collected using three language proficiency tests in reading and Metacognitive Awareness of Reading Strategies Inventory (MARSII). 94 third-year university students enrolled in the Department of English Studies at the School of Arts and Humanities in Meknes formed the sample of this investigation. With reference to data analysis, the study employed Pearson product-moment correlation and Simple Linear Regression as statistical tools to analyze the generated data. The findings of the investigated relationship showed that there was a strong positive correlation between participants' English reading proficiency and their reading metacognitive awareness, with a r-value of 0.810. It was also revealed reading metacognitive awareness predicted 65% of reading comprehension ability. Finally, the findings of the present study have brought about crucial contributions, in terms of both theory and practice, to the existing body of literature on metacognition and language learning. The results of this endeavour have also triggered various pedagogical and methodological implications and recommendations for language teachers, syllabus designers, higher education departments of English studies, and future research.

Keywords: *Language Learning, Metacognition, Reading, Metacognitive Awareness of Reading Strategies*

1. Introduction

The discovery and subsequent theoretical expansion of metacognition represent a significant advancement within the recent decades of cognitive research (Martinez, 2006). Originally, the term ‘metacognition’ has been coined by the American psychologist Flavell, who described it as “one’s knowledge concerning one’s own cognitive processes and products or anything related to them” (Flavell, 1976, p. 232). In other words, metacognition is about our own awareness and knowledge about our cognition and the mental processes it covers. It is concerned with the conscious realization of what exactly happens while cognitively processing knowledge. Moreover, being metacognitively knowledgeable involves reaching an awareness of what one knows and does and what one does not know and does not do. In this regard, Anderson (2012) states that “metacognition results in critical but healthy reflection and evaluation of one’s thinking which may result in making specific changes in how one learns” (p.170). This implies that being cognizant of one’s thinking system brings about vital realization and awareness of one’s own behaviors, which usually leads to improvement and development.

Noticeably, the concept of metacognition has been widely used in the field of second language education as a theoretical framework in the study of the learning and teaching processes. As far as studies conducted on the matter are concerned, metacognition has been recognized as learners ‘cognition about cognition’ (Flavell, 1979). It entails learners’ awareness and knowledge about the learning cognitive processes that learners engage in when learning a language. In this regard, metacognitive knowledge plays a crucial role in language learning in the sense that it helps learners monitor, regulate, and optimize their learning processes (Ridley et al., 1992). It also involves understanding how learners learn best, what strategies work for them, and being able to adapt their learning approach based on self-assessment. On the contrary, students without metacognitive awareness might not recognize when they are struggling or when they are making progress. O’Malley, Chamot, Stewner-Manzanares, Russo, and Küpper (1985) state that “Students without metacognitive approaches are essentially learners without direction or opportunity to review their progress, accomplishments, and future learning directions” (p. 561). The absence of a metacognitive awareness can lead to a lack of motivation and direction, as students do not have a clear understanding of their strengths and weaknesses.

Metacognitive knowledge has been identified as a crucial determinant in language learning, providing learners with the cognitive tools necessary to monitor, regulate, and optimize their learning processes (Ridley et al., 1992). Awareness of metacognitive language learning strategies enables learners to discern the most effective methods for themselves, identifying optimal strategies, and adapting their learning approaches through self-reflection (Martinez, 2006). Indeed, attainment of higher levels of metacognitive knowledge in a language facilitates the spontaneous establishment of a cognitive metalinguistic foundation, which in turn supports the internalization of the language (Martinez, 2006).

Furthermore, metacognitive knowledge grants language learners autonomy over their learning process. Awareness of one’s cognitive strengths and weaknesses equips learners to make informed decisions about their learning strategies, set realistic goals, track their progress, and revise their methods as necessary (Martinez, 2006). Such self-awareness and adaptability enhance both the efficacy and efficiency of language learning. Similarly, learners with robust metacognitive skills are capable of effectively planning and managing their learning activities, setting practical goals, optimizing time management, and modifying their efforts based on their evaluative understanding of their own progress (Martinez, 2006).

Additionally, metamemory and metacomprehension are integral to metacognition and play a vital role in language acquisition (Martinez, 2006). The success of comprehension, whether through reading or listening, significantly depends not only on the level of comprehension achieved but also on the learner’s awareness of their comprehension adequacy (Martinez, 2006). It is critical to recognize that

learners often misjudge their level of understanding, which can lead to serious educational missteps. As Martinez (2006) points out, a common and grave error occurs when learners believe they understand content when they do not, or when they fail to evaluate their comprehension and instead engage in passive activities such as mechanical note-taking or reading (p.697). In the context of Moroccan higher education, many students possess inaccurate perceptions of their linguistic capabilities, which complicates the development of language skills (El Madani & Larouz, 2020). This lack of awareness about their English proficiency and the effective strategies for English language learning creates significant challenges, which this study seeks to explore further.

Therefore, the current study is concerned with scrutinizing the relationship between metacognition and language learning in among Moroccan EFL university students. It aims at investigating and measuring reading ability and metacognitive knowledge. The goal is to investigate the relationship that is held between English reading ability and metacognitive awareness of reading strategies. This relationship is supported in the literature as reading metacognitive awareness implies how readers plan, monitor, assess, and utilize accessible information while comprehending written content. It also includes judgments about readers' cognitive procedures, which serve as conventional portrayals of metacognition (Mokhtari & Reichard, 2002).

2. Literature Review

2.1 Reading as a Metacognitive Process

There has been far more research conducted on the psycholinguistic and receptive process of reading and how it works. As a matter of fact, Goodman (1988) demonstrates that the reading process can be reflected in the interrelationship between language and thought that takes place while reading; he asserts that “the writer encodes thought as language and the reader decodes language to thought” (p.12). Thus, copious are the factors that are included in the reading process and which provide in-depth insights on how it operates. Significantly, many scholars speak of models when it comes to depicting reading process. With this in mind, Urquhart and Weir (1998) categorized reading models as ‘process’ and ‘componential’ models. While the former class of models describes how this process works, the second type bridges its scope to the depiction of the factors that are involved in the reading process. In this part, the researchers is so far more concerned with process models, yet, an in-depth account of the componential models and reading as a cognitive process is to be provided in later parts of this review. Simply put, the chronological view that is agreed upon in the literature states that the bottom-up approach was the first to describe the reading process, then came the top-down model, which later on was substituted by the so-called ‘interactive’ models (Urquhart & Weir, 1998).

Bottom-up processing has been considered to be a traditional approach to the reading process as it was the first to depict how this process operates. Plainly, Richards (2015) suggests that bottom-up processing is “when the reader processes a text they do so in a certain order, i.e. from words to phrases to sentences and so on, until the meaning of the text is arrived at” (p.450). In different words, bottom-up approach, as the name entails, adheres to the fact the meaning construction gradually starts from small entities of the text (words in this regard) moving to bigger structures in order to eventually come up with a blatant vision of the text. Compatibly, Gough's (1972) model provides a much more in-depth analysis of this kind of processing in which Gough asserts that the reading process begins with letters that are thought to be recognized by a cognitive scanner. In this regard, Urquhart and Weir (1998) report that once the information is processed by the scanner, it “...is passed to the decoder, which converts the string of letters into a string of systematic phonemes. This string is then passed to a LIBRIRIAN, where with the help of the LIXICON, it is recognized as a word” (p.40). Noticeably, this leads back to the previously mentioned chain that starts from words until the meaning, with the contribution of the syntactic and semantic rules, is assigned to the sentence. As viewing the process of meaning construction from small entities to bigger parts results in fair enough knowledge of what happens when reading,

seeing this process from an opposite angle (top-down processing) would indeed provide a thorough vision of this process.

Since it has clearly been stated that bottom-up processing begins with the smallest units of the text, it is logically expected that top-down processing models, and as the name suggests, should normally start with the biggest text unit. However, Urquhart and Weir (1998) note that “the term ‘top-down’ is deceptive, appearing to offer a neat converse to ‘bottom-up’, a converse which in reality does not exist” (p.42). This implies that top-down processing does not necessarily entail moving from large parts to small parts of the text; it rather “suggests that the reader makes use of background knowledge together with conceptual knowledge and processing strategies, in order to arrive at understanding of the texts” (Richards, 2015, p.450). Put differently, meaning is a product that is arrived at as both the text and the expectations and prior knowledge of the reader are brought together in the reading process. Although the text and its communicated ideas are central to the process of meaning generation, what the reader already knows plays a more influential role as it may guide and filter what is being read. In this regard, Urquhart and Weir (1998) acknowledge that “the reader comes to the text with a previously formed plan, and perhaps omits chunks of the text which seem to be irrelevant to the reader’s purpose” (p.42). Having highlighted the onus that is put on the reader when it comes to top-down processing, it is also assumed that the interaction between the reader and the text encapsulates what Goodman (1967) refers to as the process of hypothesis verification. The latter accentuates the fact that the reader makes use of the displayed data in the text along with his own background knowledge in order to confirm or debunk already made predictions. Notwithstanding the insightful analysis top-down models provide when depicting the reading process, these models have been found to be incomplete, and the attention shifted to the interactive approaches which came to bring both bottom-up and top-down processes into play.

Interactive processing models have suggested that both top-down and bottom-up processing functions together in order to help establish an interaction that would effectively contribute to meaning construction. With this in mind, Richards (2015) claims that “an interactive view of reading is based on the idea that successful reading is an act of creation. Meaning is created through the interaction between a reader and a text” (p.451). In fact, process models like those of bottom-up processing are meant to model the reading process in a sequential way. That is, each stage of this modeling ends before the next one begins (Richards, 2015). In contrast, this sequence is not a case that is recognized in the interactive models. For Stanovich (1980), interactive models suggest that a form is synthesized on the basis of information that is “provided simultaneously from several sources” (p.35). Simply put, the process of meaning construction of a text involves generating data from orthographic, lexical, syntactic, and semantic knowledge, all contributing to achieve the same purpose. In the same vein, Stanovich has been accredited for his interactive-compensatory model as it tackles the analysis of reading processing in a velvet glove. It has clearly been stated that the interactive-compensatory model “refers to the idea, intuitively appealing, that a weakness in one area of knowledge or skill, say Orthographic Knowledge, can be compensated for by strength in another area, say Syntactic Knowledge” (Urquhart & Weir, 1998, p.45). This realization has been referred to in L2 reading research by Alderson and Urquhart (1985) where they assume that background knowledge may compensate for any lack of adequacy as far as language skills are concerned. Nevertheless, interactive processing models have been subject to experiment and found to own some pitfalls. Rayner and Pollatsek (1989) assert that these models have been found to be very effective in explaining results but poor when it comes to predicting them in advance. This has been attributed to the fact that readers approach the text with their individual differences, strengths, and weaknesses. Hence, it has been alluded that “two readers may on one occasion arrive at the same level of performance by utilizing different strengths” (Urquhart & Weir, 1998, p.45). This implies that individual differences are another key factor that could be used in depicting the reading process. All in all, regardless of the weaknesses bottom-up, top-down, and interactive processing models have been found to possess, such models have at least shown insightful attempts to reflect and mirror the actual process of reading. They all have blatantly contributed to the depiction of what happens when we read, while some adhere to the vision that reading is and should be

regarded as reader-oriented, others hold the premise that the process of constructing meaning is in fact text-driven.

2.2 Metacognition and Reading Development

Given the fact that reading is considered to be a very complicated activity, the underlying cognitive processes that operate when we read are of similar complexity (Grabe, 2009). For this reason, reading as cognitive process has been the main interest of many cognitive psychologists. Urquhart and Weir (1998) view reading as “a cognitive activity; it largely takes place in the mind, and the physical manifestations of the activity, eye movements, subvocalization, etc., are comparatively superficial” (p.37). This accentuates the fact that readers, while reading a text, engage in many cognitive processes that contribute to the construction of meaning. In this regard, for a better understanding of these cognitive processes, Grabe (2009) accounts for ‘lower-level’ processes, including word recognition, syntactic parsing, and meaning encoding, and higher-level processes, including text-model formation (what the text is about) and situation-model building (how the reader interprets the text). Nevertheless, since “working memory is fundamental in understanding these processes” (Grabe, 2009, p.21), a brief account of this aspect is to be held beforehand.

The underlying concept of working memory is essential in all aspects of cognition as its understanding provides basic insights on the cognitive processing system of language learning. Many language psychologists have agreed upon the fact that memory is divided into long-term memory and working memory (sometimes referred to as short-term memory) as vital components (Grabe, 2009; Anderson, 2000; Cain, 2006; Ellis, 2005). For Grabe (2009), long-term memory is “the total set of permanent records of our experiences and our efforts to understand our environment” (p.32). In contrast, working memory is usually described as the restricted-capacity processing system (Miller, 1999); it possesses a limited storage to long-term memory and limited capabilities to perform various processes (Grabe, 2009). However, Rayner et al. (2012) acknowledge that although working memory maintains information for only two seconds maximum, there are mental rehearsal and reactivation strategies through which information can last longer periods of time. With respect to reading comprehension, Grabe (2009) states that “while long-term memory is a major resource of reading, the key memory concept for reading comprehension is working memory” (p.32). Coupled with this, working memory includes mental processes such as word information storage, word recognition, highlighting main ideas, using syntactic knowledge, inferencing and assessing reader main objectives, and building the general text structure (Grabe and Stoller, 2002).

With reference to reading comprehension, lower-level processes, on the one hand, are found to operate within working memory. That is, the identification of the roles lower-level processes play in reading provides a thorough vision of the fluent reading comprehension process (Grabe, 2009). These processes include word recognition, syntactic parsing, and meaning encoding. First, based on Perfetti’s claim “comprehension depends on successful word reading” (2007, p.357), word recognition is regarded to be the primary skill that contributes to the successful reading comprehension. Moreover, implications drawn from many studies devoted to word identification have established that word recognition skills can forecast later reading comprehension capabilities (Adams, 1990, 1999; Juel, 1988; Perfetti, 1999, 2007; Perfetti, Landi, & Oakhill, 2005). However, Stanovich (2000) argues that the ability of word recognition does not necessarily entail reading comprehension. In this regard, Grabe (2009), referring to many studies, asserts that “what most researchers do say is that fluent reading comprehension is not possible without rapid and automatic word recognition of a large vocabulary” (p.23). Another key fact to remember is that fluent word recognition requires the reader to identify forms of the word, link between the graphic form and the phonological information, trigger suitable semantic and syntactic properties, and have access to the mental lexicon (Grabe, 2009). Second, the role of syntactic parsing has been found to be a focal factor in the process of reading comprehension (Perfetti, 1999). In this vein, Grabe (2009) confirms that “it should be obvious to anyone who reflects on sentences in a text that syntactic processing is essential to comprehension” (p.29). As a matter of fact,

there are copious studies that have established a consensus that syntactic knowledge, including word ordering, modality, tenses, and determiners...etc, and processing skills provide a podium that paves the ground for a successful reading comprehension (Bowey, 1995; Bryant, Maclean, & Bradley, 1990; Demont & Gombert, 1996; Gaux & Gombert, 1999; Tunmer & Hoover, 1992). Last, once the reader successfully recognizes and syntactically processes words, the task is still incomplete as meaning encoding is also an important process that happens to influence reading comprehension. Meaning encoding forms a set of semantic meaning units, sometimes called semantic prepositions, which are considered to be the building blocks of reading comprehension (Fender, 2001; Lewis, 2000; Perfetti & Britt, 1995). In this respect, Grabe (2009) infers that semantic preposition as blocks of information are essential in reading comprehension because “the number of preposition units occurring in sets of sentences predicts how long it takes to process different sentences even if the number of words and clauses are kept equivalent” (p.31). To this end, it has come to a plain vision that since reading comprehension is a process of meaning construction, semantic meaning encoding along with all the semantic units involved is of great importance in the whole task of reading.

On the other hand, research over years has shown that higher-level processes, like lower-level ones, do extremely contribute to reading comprehension (Kintsch, 1998; Long, Johns, & Morris, 2006; Perfetti, 1999 cited in Grabe, 2009). The reader in this regard is assumed to direct resources of attention to these component skills (Grabe, 2009). These processes involve text-model formation and situation-model building. Firstly, building a text model and understanding the general idea of a longer text necessitates other information processing systems than only automatic word identification, sentence analysis, and meaning encoding. As a matter of fact, it has been acknowledged that “a text model of reading comprehension also requires the use of “bridging” inferences (minimal inference links) to connect new propositions to the network of already active propositional ideas” (Kintsch, 1998; Pressley, 2006 as cited in Grabe, 2009). That is to say, establishing a consistent link of ideas retained from a text takes place through relating and linking between concepts and ideas. Second, situation-model building refers to the reader’s own interpretation to a certain discourse (Singer & Leon, 2007). This interpretation is a product of the combination of prior knowledge with the text (Goldman, Golden, & Broek, 2007). Correspondingly, Grabe (2009) cited some scholars contending that when we read, we “discuss a text both in terms of what the writer wants us to understand and how we feel about the text and the writer” (Kintsch & Rawson, 2005; Noordman & Vonk, 1999; Perfetti, Van Dyke, & Hart, 2001, p.43). In brief, there are various factors that contribute to the building of a situation model such as reader purpose, attitudes, context, prior knowledge, and the task expectations (Grabe, 2009).

3. Research Method

The present study is an attempt to examine the nexus between metacognition and reading ability in English. In relation to the projected problem and the urge it has fell back on, research questions that would insightfully gear the process of examining language proficiency and metacognition are carefully formulated. Since the plain objective of this study is to test whether or not there is a relationship between students’ metacognitive awareness and their reading ability, the following research question is to be addressed in this regard.

Q1: Is there a relationship between students’ Metacognitive Awareness of Reading Strategies and their Reading Proficiency in English?

3.1 Research Site and Sampling

The target population in this study included third-year university students from the English departments at the school of arts and humanities in Meknes and higher school of training and education in kenitra. Moreover, the fact that this paper aims at measuring students’ metacognitive awareness of reading shares some compatibility with the chosen population as these seniors have been introduced to study skills course in which they were introduced to the basic strategies of reading.

Given the impracticality of administering the tests to all third-year university students, a sampling size is to be decided upon in this regard. This study is employed non-random sampling as the available and suitable type. However, various are the sampling types that are encapsulated within non-random sampling, and adopting one of them should be based on reason. With all these considerations in mind, non-random convenience sampling has been thought to well fit the practicum of this study. The choice of this type of sampling was based on two considerable elements, namely availability of the respondents and the accessibility of the sample size. In a nutshell, the sample of the present study included a total number of ninety-four third-year university students, thirty of them were males and fifty were females. Noticeably, the researchers had the intention of including 130 students and administered the tests to 119 students but only 94 students attended all sessions and took all six tests. The following table represents the number of participants in the present study:

Table 1: *Number of Participants*

	FLSH, Meknes	ESEF, Kenitra	Total
Researchers' intent	90	40	130
Tests administered	88	31	119
Tests received	63	31	94

3.2 Data Gathering Instruments

Given the fact that this study's practical procedure is measuring students' reading ability in English, reading comprehension test was devised. In accordance with the intent of measuring students' metacognitive awareness of reading strategies, Metacognitive Awareness of Reading Strategies Inventory (MARSI) was employed.

The English reading comprehension test was devised by the researchers based on many reading comprehension exams administered by professors in the department of English studies. It was also revised by many professors who did a lot of modifications and provided advice on some possible issues. The researchers made sure that the reading comprehension test is consistent in terms of the rubrics they include. Therefore, the indicators or the rubrics which are supposed to measure students' reading ability are as the following: choosing a title, vocabulary, true or false questions, direct questions, paraphrasing, and summarizing. These indicators were carefully devised to assure similar level of difficulty and were scored using the same scoring rubrics and procedures.

Metacognitive Awareness of Reading Strategies Inventory (MARSI) was adapted from Mokhtari, & Reichard (2002); Assessing students' metacognitive awareness of reading strategies. It was originally designed to assess adolescent and adult readers' metacognitive awareness and perceived use of reading strategies while reading academic or school-related materials. In addition, the inventory has three strategy subscales: Global Reading Strategies, Problem-Solving Strategies, and Support Reading Strategies, which include thirty different reading strategies that learners may be using while reading. Noticeably, the original version of the inventory has thirty reading strategies, but, after conducting a piloting study, the researchers had to adapt it and reduce the number of strategies to twenty-one following the directions given in the manual of the inventory.

3.3 Data Analysis Procedures

The full realization of this paper's practical objectives does not stop at the stage of data collection. The latter should be followed by the analysis of the generated data. To do so, data analysis process undertook various procedures and statistical steps to arrive at a thorough scrutiny of the results.

In accordance with the research question and hypothesis addressed within the current study, both descriptive and inferential statistics were employed, relying on the Statistical Package for the Social Sciences (SPSS). Descriptive statistics constitutes a methodological framework aimed at providing a quantitative portrayal of the examined sample and crucial attributes inherent to the provided dataset through parameters such as mean values and standard deviations. Its principal focus resides in the

comprehensive analysis and coherent presentation of data. Conversely, the application of inferential statistics includes the execution of statistical analyses on the collected data. As expressed by Polgar and Thomas (2000), descriptive statistics encapsulates the essence of elucidating the sample's traits and the dataset's intrinsic attributes, whereas inferential statistics entails a distinct purpose. In general, inferential statistics starts with the formulation of a hypothesis and subsequently scrutinizes the congruity between the collected data and the stipulated hypothesis (Brown & Saunders, 2008). The fundamental roles encompassed within inferential statistics entail comparative analysis of data, hypothesis testing, and the formulation of predictive inferences pertaining to the examined phenomena.

The present study aims at investigating the correlation between reading and metacognition. That is, the analysis of the data primarily entailed the utilization of the Pearson product-moment correlation and simple linear regression analysis. The Pearson product-moment correlation coefficient (r) serves as a statistical tool that measures the strength and direction of a linear association between two quantitative variables. The direction of this linear association can be either positive or negative. A positive direction indicates that the two variables progress in a congruent direction, while a negative direction denotes a contrary trend. Noticeably, the value of ' r ' encompasses a spectrum ranging from -1.0 (reflecting opposite shifts in variable values) to +1.0 (indicating uniform shifts in variable values). In the context of this study, the elucidation of the correlation coefficient ' r ' was guided by Salkind's (2000) delineations: ' r ' = 0-0.2 indicates no to very weak correlation, ' r ' = 0.2-0.4 entails weak correlation, ' r ' = 0.4-0.6 means moderate correlation, ' r ' = 0.6-0.8 refers to strong correlation, and ' r ' = 0.8-1.0 indicates very strong to perfect correlation. Moreover, akin to correlation, regression analysis offers a means for researchers to investigate the interaction between two continuous variables, highlighting the changes that take place in a variable based on the changes in another predicting variable.

3.4 Ethical Considerations

During the process of administering the tests and collecting data from participants, the researchers had to considerably take various ethical decisions and remain very alert in doing what is morally and legally right in research. First, the researchers sought consent from the participants for their participation. Hence, all the participating students willingly and consciously chose to take part in this study. Second, the researchers had to blatantly inform the participants that these tests are not part of any official university examination and their results would be kept confidential and only used for research purposes. Last, the researchers respected the privacy and confidentiality of participants' personal information in the sense that the data were kept confidential, and their privacy was protected. The researchers took measures to anonymize data, store it securely, and present findings in a way that prevented identification of the participants. They were given their total freedom to even use nicknames instead of their actual names as the research is more interested in what is produced than who produced it.

4. Results and Discussion

4.1 Descriptive Statistics

This subsection aims at accounting for the correlation for the relationship between students' English reading comprehension performance and their reading metacognitive awareness. In doing so, it is worth mentioning that the sub-section attempts to provide answers to the research question and accept or reject the hypothesis. These are as the following:

RQ: Is there a relationship between students' English reading comprehension performance and their reading metacognitive awareness?

DH: There is a relationship between students' English reading comprehension performance and their reading metacognitive awareness.

The quantitative variables between which the correlation is to be sought are English reading comprehension performance and reading metacognitive awareness. The quantification of these variables goes back to the fact that the reading ability has been measured using tests that yielded scores as numerical data. Considerably, it is also important to note that while English reading ability is the dependent variable, the independent one is reading metacognitive awareness. All these considered, Pearson product-moment correlation as a type of statistical analysis, together with a scatterplot are to be tabled, interpreted, and discussed in order to describe the direction and the strength of the relationship. In order to determine how strong the relationship between the dependent and independent variables is and the role of the independent variable in predicting the dependent one, regression analysis is to be carried out and discussed.

The null hypothesis that this analysis is devoted to examine is as the following:

NH: there is no relationship between students' English reading comprehension performance and their reading metacognitive awareness.

It is of paramount importance to account for the linearity and homoscedasticity, which are to be checked through a scatter plot of the relationship between English reading comprehension performance and reading metacognitive awareness. The following is a scatter plot of the correlation between reading comprehension (RC) and reading metacognitive awareness (RMA) tests:

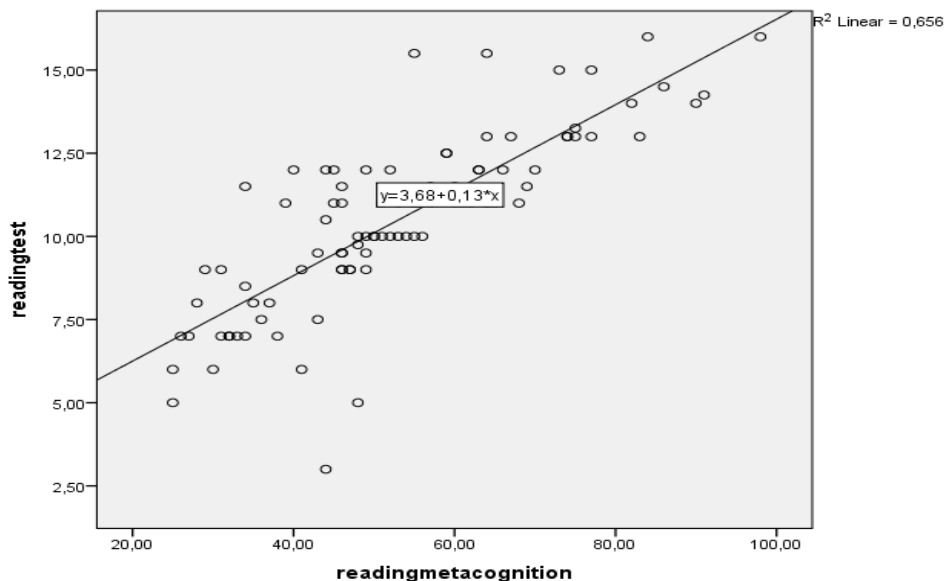


Figure 1: *The Scatterplot of the Correlation between RC and RMA Tests*

As mentioned earlier, scrutinizing the scatterplot is of very indispensable importance in the sense that it draws upon assumptions on the nature and the linearity of the relationship between reading comprehension and reading metacognitive awareness. In fact, figure 1 displays the scatterplot of the two quantitative variables under scrutiny. It is blatantly shown that the data dots are scattered in an almost unified manner; they follow a straight line upward. Given the latter apparent fact, the relationship between participants' scores in reading comprehension and reading metacognitive awareness tests is represented to be linear. In addition, this linear relationship is also reflected in R^2 linear as it equals 0.656. It is also displayed that the space between dots from the line is impartially similar, which implies the visual linearity of the relationship. Having explored the visual inspection of the nature and the linearity of the relationship between the two variables, a Pearson product-moment correlation test was run to reveal the degree of this relationship.

Table 2: Correlation between RC and MARSJ Tests

		readingtest	readingmetacognition
readingtest	Pearson Correlation	1	,810 ^{**}
	Sig. (2-tailed)		,000
	N	94	94
readingmetacognition	Pearson Correlation	,810 ^{**}	1
	Sig. (2-tailed)	,000	
	N	94	94

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

Table 2 demonstrates the correlation between participants’ scores in the English reading comprehension test and the MARSJ. That is, the table displays the r-value correlation between the two variables (English reading comprehension and MARSJ), and which equals 0.810. The latter implies that there is an almost perfect positive correlation between participants’ scores in English reading comprehension and MARSJ tests’ scores. Therefore, the Pearson product-moment correlation results indicate that there is a strong positive relationship between participant’s reading comprehension performance and their metacognitive awareness of reading strategies. In order to investigate the predictive relationship between reading comprehension performance as a dependent variable and reading metacognitive awareness as an independent variable, bivariate simple linear regression analysis has been conducted.

Table 3: Model Summary^b for Reading Comprehension and Reading Metacognition

Model	R	R Square	Std. Error of the Estimate
1	,810 ^a	,656	1,54082

Based on table 3, the R and R square are shown and calculated. The R value implies the simple correlation and equals 0.81. The latter indicates a high level of correlation. Moreover, the R² value represents how much of the total variance in reading comprehension performance, dependent variable, can be explained by reading metacognitive awareness, independent variable. The value in the table shows that 65% of the dependent variable can be explained by the independent variable, which is a very large variation. In other words, reading metacognitive awareness has been found to predict 65% of reading comprehension ability. These results postulate the necessity to examine the statistical significance of the regression model.

Table 4: ANOVA^a for Reading Comprehension and Reading Metacognition

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	416,984	1	416,984	175,636	,000 ^b
	Residual	218,421	92	2,374		
	Total	635,405	93			

a. Dependent Variable: readingtest

b. Predictors: (Constant), readingmetacognition

Table 4 reports on how well the regression model and equation fit the data and predicted the dependent variable. It shows that the sig value equals 0.000 ($p < 0.01$), which implies that the regression model predicted reading comprehension ability significantly well. Further details in relation to the predictive relationship between reading comprehension ability and reading metacognitive awareness and its equation are displayed in the next table.

Table 4: *Coefficients^a for Reading Comprehension and Reading Metacognition*

Model	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
1 (Constant)	3,682	,537	6,855	,000
readingmetacognition	,128	,010	13,253	,000

The regression equation for the predictive relationship between reading comprehension ability and reading metacognitive awareness is

$$\text{Reading Comprehension Ability} = 3.682 + 0.128 * \text{Reading Metacognitive Awareness}$$

Based on table 4, the Beta standardized coefficient of 0.81 implies that a one-unit change of one standard deviation in students’ reading metacognitive awareness brought about a one-unit change of students’ reading comprehension ability by 0.81. Furthermore, the t-test results, along with the sig value ($t=13.25$, $p < .001$), demonstrate that the Beta coefficient is significantly different from zero and shows the statistical significance of the such value.

All in all, the relationship between students’ English reading comprehension performance and their reading metacognitive awareness has statistically been scrutinized in different ways. First, the visual inspection of the nature and the linearity of the relationship between reading comprehension ability and reading metacognitive awareness has been conducted through a scatterplot. The fact that the data dots followed a straight line implied that the relationship between the two variable is a linear one. Second, the degree of such linear relationship has been checked through the conduct of a Pearson product-moment correlation. The results showed that the r-value correlation was 0.810, which indicated that there is a strong positive relationship between participant’s reading comprehension performance and their metacognitive awareness of reading strategies. Last, the examination of the predictive relationship between the two variables was tackled through a bivariate simple linear regression analysis. The findings displayed that students’ reading metacognitive awareness could predict 65% of their reading comprehension ability. They also showed that students with a higher level of reading metacognitive awareness are expected to be better readers, and any change in their metacognitive awareness of reading strategies means change in their reading comprehension performance.

4.2 Discussion of the Results

The findings indicate that there is a strong positive correlation between participants’ scores in English reading comprehension test and metacognitive awareness reading strategies inventory. It has also been shown that reading metacognitive awareness paves the path for better reading comprehension performance. This confirms the research hypothesis of this study which postulates that students’ metacognitive awareness of reading strategies has a positive impact on their English reading comprehension ability. In view of this, the metacognitive knowledge students acquire fosters their English reading skills as they are more deliberate and conscious in their use of reading strategies. Considerably, this proved fact has previously been shared and agreed upon by many empirical studies.

The role of metacognitive knowledge in reading development has extensively been marked in different pieces of research. In her empirical study, Guo (2018) states that “the results suggested that metacognitive knowledge is a crucial contributor to L2 reading” (p.23). This advocates the central

function of metacognitive knowledge in language learning, which contributes to the literature on metacognition and language development.

Cartwright (2015) has concluded that metacognitive knowledge is a higher-order cognitive proficiency that equips readers with ‘cognitive flexibility’ to “shift attention between text details and enhance their inhibition ability to ignore irrelevant information and suppress distracting behavior” (cited in Guo, 2018, p.23). Another akin finding by (Vuong & Martin, 2014) is that the executive control function has a critical role in resolving representational conflicts and giving more space to alternative interpretations during the process of comprehension.

As mentioned earlier, reading comprehension ability and metacognitive awareness are important factors in the process of reading comprehension. The relationship between these two variables has been a subject of interest of educational researchers. In this study, a visual inspection of the nature and linearity of the relationship between reading comprehension ability and reading metacognitive awareness has been presented. By analyzing a scatterplot of the data, it was observed that the data dots followed a straight line, indicating a linear relationship between the two variables.

The linear relationship observed between reading comprehension ability and reading metacognitive awareness has important insights for understanding the role of metacognitive processes in fostering reading comprehension skills. Metacognitive awareness involves the ability to monitor and regulate one's thinking and learning processes. When learners have higher levels of metacognitive awareness, they are more likely to employ effective reading strategies and engage in self-regulation, leading to improved reading comprehension.

This linear relationship suggests that as learners' reading comprehension ability increases, their reading metacognitive awareness also tends to increase proportionally. This finding indicates that interventions and instructional teaching methods designed to enhance metacognitive awareness may positively impact and boost reading comprehension ability. Teachers can focus on teaching metacognitive strategies explicitly, fostering self-reflection, and providing opportunities for students to monitor and evaluate their comprehension processes.

The observed linear relationship between learners' reading metacognitive awareness and their reading comprehension ability has been found and confirmed by various empirical studies. The results of such relationship align with previous research, supporting the notion that reading metacognitive awareness and reading comprehension ability are in a linear relationship. In fact, Baker (2005) conducted a study in which they examined the relationship between reading comprehension ability and metacognitive awareness of university students. Their study yielded that the scrutinized relationship was linear, implying that students with higher metacognitive awareness also showcased higher reading comprehension ability. Moreover, Efklides (2011) scrutinized the relationship between metacognition and reading comprehension in different age groups. The results showed a consistent positive correlation between metacognitive awareness and reading comprehension ability across different age ranges, supporting the notion of a linear relationship between these variables.

The obtained correlation coefficient, ρ -value, of 0.810 indicates a strong positive relationship between reading comprehension performance and metacognitive awareness of reading strategies. This proposes that learners who possess a higher level of metacognitive awareness tend to exhibit better reading comprehension skills. The positive correlation coefficient suggests that as metacognitive awareness increases, reading comprehension performance also tends to improve.

Several possible explanations can be discussed to understand this strong positive relationship. First, language learners with a higher level of metacognitive awareness are more likely to be aware of their reading comprehension strengths and weaknesses. They are capable of employing suitable strategies to enhance their understanding of the text, such as making predictions, summarizing key points, and monitoring their comprehension. These strategies enable them to actively engage with the

text and make necessary adjustments when faced with comprehension difficulties. Second, metacognitive awareness enables students to monitor their comprehension effectively. They are better equipped to recognize when they are not understanding the text and can employ appropriate strategies to address comprehension gaps and challenges. Metacognitive monitoring allows readers to identify and resolve comprehension breakdowns, leading to improved overall comprehension performance.

Furthermore, language learners with higher metacognitive awareness may possess a greater repertoire of reading strategies. They are more likely to employ a range of strategies in a flexible manner, depending on the nature of the text and their comprehension goals. These strategies may include previewing the text, generating questions, clarifying confusing parts, and summarizing key ideas. The ability to employ diverse reading strategies enhances comprehension performance by facilitating the extraction of meaning from the text.

These findings align with previous research that has demonstrated a positive relationship between metacognitive awareness and reading comprehension. For example, a study by Baker and Brown (2018) found a significant correlation between metacognitive awareness and reading comprehension scores among elementary school students. Similarly, a research study by Mokhtari and Reichard (2002) investigated the relationship between reading comprehension and reading metacognitive awareness among university students in the United States. The results of the study showed that metacognitive awareness was positively related to reading comprehension performance, and that students who used metacognitive strategies had higher comprehension scores. Another study was conducted in a different context by Al-Qahtani (2020). The study explored the linkage between reading comprehension ability and metacognitive awareness among Saudi EFL learners. The findings presented that there was a positive correlation between metacognitive awareness and reading comprehension, and that also students who used more metacognitive strategies had higher comprehension scores.

The findings of the first examined relationship also demonstrated a predictive relationship between students' reading metacognitive awareness and their reading comprehension ability. Specifically, the study revealed that students' reading metacognitive awareness accounted for approximately 65% of their reading comprehension skills. This highlights the considerable impact of metacognition on reading performance. The research findings also emphasized that any variations in students' metacognitive awareness of reading strategies correspond to changes in their reading comprehension performance. That is, students with higher level of reading metacognitive awareness are anticipated to be possess better reading comprehension skills, and any changes in their metacognitive awareness of reading strategies bring about and anticipate change in their reading comprehension performance. Since the involved participants in this study are university students belonging to the department of English studies, their higher metacognitive awareness and fostered reading comprehension skills could be due to the fact that they were introduced to explicit reading comprehension strategies in semester 1 "study skills" course. All in all, the findings of the first research question are compatible with all aforementioned studies in the sense that participants' English reading ability has been found to positively be impacted by their deliberate and cognizant use of reading strategies in the process of comprehension.

Recent empirical studies have consistently demonstrated a strong positive correlation between participants' scores in English reading comprehension tests and their metacognitive awareness of reading strategies. For instance, a study by Khellab, Demirel, and Mohammadzadeh (2022) revealed that learners who exhibited higher levels of metacognitive awareness scored significantly better on reading comprehension assessments. This suggests that when readers are more aware of their cognitive processes while reading, they can better monitor and regulate their understanding, leading to improved comprehension outcomes (Khellab, Demirel, & Mohammadzadeh, 2022).

Further analysis indicates that metacognitive awareness not only correlates with but also actively enhances reading comprehension performance. A study by Abd Ali, Bashar, and Khonamri (2023) found that interventions aimed at increasing students' metacognitive awareness of reading strategies

resulted in substantial improvements in their reading comprehension over time. The research showed that students who received training in metacognitive strategies, such as self-questioning and summarizing, were more adept at understanding and retaining complex texts compared to those who did not receive such training (Abd Ali, Bashar, & Khonamri, 2023). These findings highlight the importance of incorporating metacognitive strategy instruction in educational curricula to bolster reading comprehension skills.

Moreover, the role of metacognitive awareness in reading comprehension has been reinforced by several other studies in the past five years. For example, Zhang and Seepho (2020) conducted a study involving secondary school students and found that those with higher metacognitive awareness were better at identifying main ideas, making inferences, and connecting new information to prior knowledge. This ability to engage in higher-order thinking processes is crucial for effective reading comprehension. Collectively, these studies underscore the significant impact of metacognitive awareness on reading performance and suggest that fostering such awareness can lead to more effective and meaningful reading experiences for learners (Zhang & Seepho, 2020).

To sum up, the investigation of the research question in this study has yielded pertinent results and discussions. The visual inspection of the scatterplot indicated a linear relationship between reading comprehension ability and reading metacognitive awareness. This finding suggests that individuals with higher reading comprehension abilities tend to demonstrate higher levels of metacognitive awareness. The key visions of this relationship highlight the importance of fostering metacognitive awareness through explicit instruction and interventions, which can potentially enhance reading comprehension abilities. Moreover, the findings also provided empirical evidence of a strong positive relationship between reading comprehension performance and metacognitive awareness of reading strategies. This suggested that learners with higher levels of metacognitive awareness tend to exhibit better reading comprehension. Last, the findings discussed in this first relationship highlighted the crucial role of reading metacognitive awareness in predicting students' reading comprehension ability. Students with higher levels of metacognitive awareness are more likely to be proficient readers. Additionally, any changes in students' metacognitive awareness of reading strategies match changes in their reading comprehension performance.

5. Conclusion

5.1 Contributions of the Study

The findings of the examined relationship highlighted a strong positive correlation between reading proficiency and metacognitive awareness of reading strategies. These results contributed significantly to both the theoretical and practical aspects of the literature. First, the spotted correlation added significant insights into the growing understanding of the relationship between metacognition and reading. That is, the established strong positive correlation between reading proficiency and metacognitive awareness of reading strategies supported the theory that postulates that learners who possess a higher level of metacognitive awareness are more likely to be skilled readers. This insight enriched the theoretical framework of metacognition's role in the complex process of reading comprehension.

Second, the spotted influence metacognition has on reading development provided key insights into the relationship between cognitive load and comprehension. In fact, cognitive load theory is a framework that explains how the capacity of our working memory influences learning and cognitive tasks. In relation to reading comprehension, successful readers who possess metacognitive awareness are likely to engage in efficient cognitive processes, allocating their mental resources optimally for comprehension. Moreover, readers with metacognitive awareness are conscious of their comprehension strategies, such as identifying main ideas, making predictions, and self-monitoring for understanding. they have the ability to select appropriate strategies based on the nature of the text and their own

understanding. In doing so, they allocate their limited mental resources optimally, minimizing extraneous cognitive load and directing more resources toward germane cognitive load. This optimal allocation allows them to comprehend the material with greater ease and accuracy. In brief, this connection between metacognitive awareness and reading proficiency contributes to the understanding of cognitive load in reading, suggesting that effective readers are better at managing cognitive resources.

As far as practice is concerned, the findings of the relationship between reading and metacognition provided key practical insights that could enrich the practicum of language teaching and learning and research. The nexus between the two concepts underscored the importance of including metacognitive instruction in teacher training programs. Teachers equipped with an understanding of metacognitive strategies can not only apply them in their classrooms but also model these strategies for their students. This can create a ripple effect, where students observe and adopt effective metacognitive practices.

5.2 Implications of the Study

Based on the results of this study, multiple implications have been triggered for the sake of better language teaching and learning practices and outcomes. The following subsections account for implications if the study drawn for language teachers, syllabus designers, and higher education English departments.

5.2.1 Implications for Language Teachers

The findings the present study suggest a significant correlation between language proficiency and metacognitive awareness of language learning strategies. This correlation has important pedagogical implications for language teachers, as it highlights the need to consider metacognition and language learning strategies in their instructional approaches. In fact, language teachers can design instruction that explicitly teaches students about metacognition and effective language learning strategies. Raising students' awareness of these strategies and helping them understand how to apply them helps teachers empower learners to take more control over their learning process. Moreover, recognizing the correlation between language proficiency and metacognitive awareness, teachers can develop more individualized and differentiated approaches to instruction. Students at different proficiency levels may benefit from varying degrees of metacognitive guidance and strategy training.

One of the most essential implications taken from the present study is the explicit metacognitive teaching. Teachers should incorporate metacognitive training directly into language lessons. This could involve teaching students how to set goals, monitor their progress, identify challenges, and adjust their strategies accordingly. Encouraging self-reflection and self-regulation can enhance students' ability to learn the language effectively. Furthermore, teachers should emphasize the importance of being aware of one's own learning strategies. Students can become more mindful learners who actively select and adapt strategies to suit their needs through discussing different strategies and their potential benefits. Noticeably, instructors need to demonstrate effective language learning strategies to students, showing them how to apply these strategies in real-life language tasks. This modeling can help students see the practical value of metacognitive awareness strategies.

Another key implication for teachers stresses on the importance of collaborative learning. Teachers should incorporate collaborative activities that encourage students to discuss and share their language learning strategies with peers. This strategy not only broadens their repertoire of strategies but also exposes them to different perspectives on effective learning. Correspondently, teachers are advised to encourage students to reflect on their language learning experiences. It is far agreed upon that regular self-assessment and self-evaluation can foster metacognitive development, and they lead to greater awareness of individual strengths and areas for improvement. In an akin view, it is highly recommended that teachers adjust assessment methods to include aspects of metacognitive awareness and strategy use.

The findings of the study have touched upon the scaffolding approach, advising teachers to start with simpler reading tasks and gradually increase the complexity. As students gain confidence and

experience, they can experiment with different strategies. It is believed that this incremental approach helps build their metacognitive awareness organically. Besides, teachers should be inclined to involve students in a long-term planning process. They have to help them set long-term language learning goals and break them down into manageable steps. This process involves ongoing metacognitive reflection and strategic planning, which can enhance their overall language proficiency. Finally, instructors are recommended to provide constructive feedback on students' language learning strategies. Feedback and guidance help them identify instances where certain strategies were particularly effective or where adjustments could be made for better outcomes.

5.2.2 Implications for Syllabus Designers

The findings of the study have important pedagogical implications for syllabus designers in designing language curricula and instructional approaches. Syllabus designers should consider integrating metacognitive strategy instruction into language curricula in a progressive and scaffolded manner. As learners advance in their language proficiency levels, the complexity and sophistication of metacognitive strategies can be gradually introduced. For example, beginners might focus on basic awareness of strategies such as setting goals and self-monitoring, while more advanced learners could delve into strategies like self-regulation and reflection. Moreover, the present study suggests that metacognitive awareness of language learning strategies is not inherent and can be developed through explicit instruction. Syllabus designers should incorporate explicit teaching of metacognitive strategies, providing learners with a repertoire of strategies that they can consciously select and apply based on their individual needs. This might involve dedicated lessons or modules focused on metacognitive strategy instruction.

Syllabus designers are also asked to consider including workshops or training sessions dedicated to teaching learners how to become more aware of their learning process and how to apply appropriate strategies. These workshops could be integrated into language courses as standalone units or supplementary materials. Equally important, syllabus designers should recognize that learners have diverse needs and preferences when it comes to language learning strategies. They need to create opportunities for learners to identify and develop strategies that suit their learning styles and preferences. This implication might involve allowing learners to set personal language learning goals, choose strategies that align with their goals, and reflect on their efficacy.

When it comes to reflective learning, syllabus designers should incorporate reflective activities into the curriculum, where learners can regularly assess and evaluate their language learning strategies. There is a consensus that encouraging learners to reflect on their strategies, their effectiveness, and any necessary adjustments can enhance their metacognitive awareness and self-directed learning skills. Last, curriculum designers are advised to design assessment methods that not only evaluate language proficiency but also assess the learners' metacognitive awareness of language learning strategies. This could involve self-assessment, peer assessment, or even the inclusion of metacognitive strategy-related questions in language tests.

5.2.3 Implications for Higher Education English Departments

Several important pedagogical implications have been drawn for higher education English departments, based on the findings of the current study. One of the key implications addressed to the English departments is faculty professional development. Heads of the English departments should work on providing professional development opportunities for faculty to stay updated on the latest research and best practices related to metacognitive awareness and language learning strategies. This can ensure that instructors are equipped to incorporate these findings into their teaching methods. Coupled with this, the English departments need to make use of technology to enhance metacognitive awareness and language learning strategies. It is commonly shared that digital tools can provide students with opportunities for self-assessment, tracking progress, and accessing resources that cater to their individual needs.

In an akin vein, English departments are highly advised to incorporate explicit instruction on metacognitive strategies within language courses. They have to encourage students to reflect on their learning processes, set goals, and monitor their own progress. This can empower students to take ownership of their learning and develop more effective language learning habits. Finally, departments of language need to organize workshops or seminars specifically focused on enhancing metacognitive awareness and teaching effective language learning strategies. These workshops can provide students with practical tools to better regulate their learning process and optimize their language learning experiences.

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