



**THE IMPACT OF EXPLICITNESS-BASED
TRAINING IN (META) COGNITIVE READING STRATEGIES
ON MOROCCAN EFL LEARNERS' READING COMPREHENSION
SCORES IN ENGLISH (L3): A COMPARISON BETWEEN HIGH
SCHOOL-LEVEL AND UNIVERSITY-LEVEL STUDENTS**

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Abstract:

The present quasi-experimental study, conducted from 2012 to 2014 during the prolonged period of doing my PhD research (from 2010 to 2015) on metacognitive EFL reading, aims to unveil the perceived impact of explicit training in cognitive and metacognitive reading strategies on Moroccan EFL learners' reading comprehension scores. By means of the pre-post-test design, this study draws a comparison between the reading achievement gains obtained by the English department first-semester university students and the ones attained by the first-year baccalaureate students. For the fulfilment of this articulated objective, the study targeted 113 university students (Control Group: n=50; Treatment Group: n=63) and 86 high school-level students (Control Group: n=42; Treatment Group: n=44). The data were assembled through the reading comprehension tests (i.e., pre-test, post-test) both before and after the conduct of the explicit (meta) cognitive reading strategy training, which was coupled with a corpus of reading comprehension texts. The results indicate that (meta) cognitive reading strategy instruction (CMRSI) positively impacted the reading outcomes attained by the university learners in the treatment rather than the control condition at post-testing. Further, the high school-level learners in the treatment group did not reveal any incremental advance in the level of reading achievement scores compared to their counterparts in the control group at the post-test stage. Hence, the study puts a high premium on some viable implications associated with EFL reading instruction and sets forth a few research limitations.

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Keywords: metacognition, metacognitive experience, metacognitive reading strategies, reading achievement, reading strategy instruction

1. Introduction

The overarching role of metacognition in facilitating textual processing and analysis, as a dynamic procedure entailing deep-level strategic heuristics, has been highlighted by a growing body of research (e.g., Ahour & Mohsisni, 2014; Allen & Hancock, 2008; Baker & Brown, 1984b; Garner, 1987; Lawrence, 2007; Msaddek, 2013, 2015). It is true that self-directed and self-regulated reading, which is the core essential that is to be underscored in the broad universe of education, requires the learners to take the proper course of action in grasping the textual content in a diligent manner. In fact, reading is deemed to be the ultimate outcome of the use of the requisite strategies and the reliance on textual input. This reveals that the proactive act of having full control over the multifaceted procedure of reading by applying a wide spectrum of meta-strategic techniques is predicated on such core variables as critical thinking, metacognition, executive control, and self-regulation (Msaddek, 2013). These basic constituents formulate the robust foundations for the conduct of a sophisticated, effectual form of textual processing within an EFL context. This state of affairs places into perspective the view that learners are meant to receive instruction on how to self-regulate their strategic reading behaviors in the hope of ensuring sufficient grades at the level of EFL reading comprehension.

As maintained by Brown (1981), the identification of the essential elements of the texts is associated with maturity. That is, mature, autonomous learners can determine and extract the crucial statements and views that are contained in a given text. They can decipher the textual input in a more sophisticated manner than the young learners do. According to Brown (1981), the strategy of selecting ideas is 'age-dependent' in the sense that adult readers are better at differentiating between the most important and the least important information in a typical written text. In addition, it is to be expected that adult learners, namely at the university level, are, to some extent, cognizant of the dynamic processes of having recourse to their schemata (i.e., content, cultural, and formal schemata) and constructing novel, rich ones through intensive reading practices. On the contrary, a number of high school-level learners lack acute awareness of the procedures that facilitate the generation as well as the activation of the background knowledge (schemata) that serves as a 'frame of reference' for grasping the content encapsulated in any written discourse. Thus, maturity, as stated by Brown (1981), is deemed one of the major factors that leads to the building of an accurate understanding of the text-based input.

Further, most EFL learners experience some reading difficulties that impede their adopted course of action towards the attainment of an effective understanding of the advanced-level written texts (Al-Jarrah & Ismail, 2018; Block, 1992; Hezam *et al.*, 2022). In this sense, the premise that learners can initiate themselves into a rigorous, critical form

of textual reading through exposure to systemic strategy instruction has been proven worthwhile by many educationalists and reading specialists (Ahour & Mohseni, 2014; Block & Duffy, 2008; da Costa, 2022; Kit-ling, 2017; Li *et al.*, 2022; Msaddek, 2015, 2016; Msaddek & Boudasamout, 2023; Shuqin & Kamarudin, 2023). Clearly, a broad range of such high-level reading strategies (RSs) as goal-setting, background knowledge activation, inferring, self-monitoring, self-questioning, recalling can be improved through explicit instruction. This shows that the effectual deployment of RSs can be further enhanced through reading strategy training as a structured framework for the systematic conduct of an efficiency-bound reading act amongst language learners.

In this vein, it is assumed that reading strategy instruction occupies a pivotal part in both reinforcing the learners' metacognitive knowledge of reading heuristics and enriching their metacognitive experience of text processing on an appreciably vast scale. In effect, many studies (e.g., da Costa, 2022; Dewitz *et al.*, 2009; Kit-ling, 2017; Msaddek, 2016) attest to the viable role of strategy instruction in the improvement of the learners' reading outcomes. To put it succinctly, if EFL learners receive effective training in the concerted use of (meta) cognitive reading strategies (CMRSs), they can foster and apply them to a large body of differing advanced-level written discourse and thus succeed in taking control of the adopted reading modality. Actually, in consideration of the stark paucity of quasi-experimental studies conducted on CMRSs in the Moroccan EFL setting, this research study attempts to corroborate the perceived impact of (meta) cognitive strategy instruction on EFL learners' reading comprehension scores. More specifically, the current study tends to draw a distinction between the high school-level (control group & experimental group) and the university-level learners (control group & experimental group) in terms of the reading achievement scores gained before and after the delivery of (meta) cognitive reading strategy instruction (CMRSI).

2. Literature Review

2.1. Cognition Versus Metacognition

Cognition is viewed as the mental process that facilitates the way of acquiring, analyzing, and processing information. As claimed by Wood (1983), cognition is "*the act or process of knowing*" (p.4). Given the interactive nature between cognition and language, it is plausible that one cannot achieve the optimum understanding, nor can one convey the target message without dependence on cognition. The latter allows language learners to store and retrieve ideas, perceptions, and knowledge claims about differing subject matters. According to Piaget (1983), cognition amply reflects two very simultaneous and complementary basic characteristics, assimilation and accommodation. The first typical characteristic, namely assimilation, "*refers to the process of adapting external stimuli to one's internal mental structures*" (Flavell *et al.*, 1993, p.5). For the sake of clarification, assimilation, as a cognitive process, means processing, interpreting, and comprehending a particularly given piece of information (Msaddek, 2015). This achievement of

comprehension depends, to a great extent, on the learners' background knowledge which plays an increasingly important role in fully assimilating and making sense of the sought meaning.

With regard to the second characteristic, which pertains to accommodation, it is intimately intertwined with the process of adapting the mental structures to the structures of the stimuli (Flavell *et al.*, 1993). It generally refers to the way learners match their previously acquired knowledge to the given new information with the purpose of achieving a thorough, complete understanding of the content. More explicitly, Piaget (1983) claims that these cognitive aspects, assimilation and accommodation, are of great, equal significance and should occur together in an interactive way. They, in essence, occupy a crucial part in enabling learners to cope with cognitive tasks and come up with a sufficient interpretation of ideas and facts. All in all, assimilation and accommodation are closely interdependent processes which formulate the solid foundation of cognition (Msaddek, 2015).

As to metacognition, as a multidimensional aspect of analytical, logical thinking, it constitutes an essential part of cognitive and educational psychology. It was coined by Flavell (1971), who attempted to elucidate the monitoring skills and regulatory processes enacted by the human memory. In effect, metacognition is thought of as the learners' awareness of their cognitive processes, mental capacities, and their thinking patterns. It involves 'meta-level' reasoning for undertaking a myriad of cognitively demanding tasks and learning practices. In this vein, engagement in metacognitive thinking assists learners in constructing their metacognitive knowledge and nurturing metacognitive experience while performing cognitive tasks (i.e., reading, writing). This features that metacognitive experiences serve as a direct outcome of effectual processing and synthesizing different written texts. In fact, drawing upon metacognitive knowledge during the process of reading any particular written discourse, be it narrative, expository, or argumentative in kind, helps the learners build up their metacognitive experience, which, in a way, regulates and shapes the progress of understanding in a successful way (Msaddek, 2015). Apparently, the development of the potential ability to comprehend textual content can be based on the interaction between metacognitive knowledge and metacognitive experience.

Thus, while cognition involves remembering, perceiving, learning, and reasoning (Menary, 2007, p.10), metacognition, as a typical reflection on strategic learning behaviors, is the individual's awareness of his/her cognitive capabilities, the nature of the task assigned, the 'high-level' strategies that are to be applied. It is the learners' meta-strategic consciousness of the cognitive demands of any complex cognitive task (i.e., reading, writing, speaking) that is conducted in the sphere of education. More plausibly, metacognition involves two such basic variables as knowledge of cognition and regulation of cognition (Baker & Brown, 1984b; Schmitt & Newby, 1986). In this context, it is declared that though there is a marked difference between cognition and metacognition in that cognitive tasks are performed and regulated through

metacognitive thinking, they are intricately intertwined (Msaddek, 2023). This unravels that there exists a reciprocal, dynamic correlation between cognition and metacognition in EFL reading in particular, and in foreign/ second language learning in general.

2.2. The Inferential Process of Reading

Viewed as one of the essential skills in foreign/ second language learning, reading enables the learners to internalize a potentially rich set of ideas, assumptions, premises and perceptions. It is inextricably correlated with metacognition (Garner, 1987) insofar as the processing modes and the inferential procedures enacted by the learners are guided and strengthened through monitoring, regulating, and checking the nature and quality of progress at the level of understanding. Under this account, the multifaceted process of reading entails the deployment of cognitive (e.g., predicting, inferring, main idea selection, visualizing, underlining, note taking, paraphrasing) as well as metacognitive strategies (goal-setting, background knowledge use, self-monitoring, self-questioning, rereading, recalling, summarizing) for mentally navigating the written discourse in a principled fashion (Msaddek, 2015). Whilst cognitive reading strategies (CRSs) are used by learners for making cognitive progress (Flavell, 1981), metacognitive reading strategies (MRSs) are tapped for monitoring and reflecting upon the written input (Lawrence, 2007). Therefore, being conceptualized as an inferential, multifaceted process, reading necessitates mental efforts, focused attention, analytical reasoning, and metacognitive thinking on the part of EFL learners to construct an efficient form of textual comprehension (Msaddek, 2013).

Granted that inference-making is a core part of the reading process, it is essential that learners pay shrewd attention to the words and sentences embedded in the written input. In this regard, many educational researchers declare that there are two major types of inferences: 'propositional' and 'pragmatic' inferences (Chaffin, 1979; Harris & Monaco, 1978). The first kind refers to the inferences deduced by learners from the content of the sentences, phrases, and words of the text. This reveals that 'propositional inferences' are generally based on and relevant to what is included in the written discourse. i.e., learners tend to unravel only the explicit meaning that the writer/author intends to express in his/her text (Msaddek, 2015). With regard to the second kind, it is related to pragmatic inferences that "*are derived from knowledge sources beyond the linguistic input of a text*" (Chikalanga, 1992). Put succinctly, this type of inference is constructed by learners depending on their background knowledge, which plays a significant role in enabling them to attain a coherent understanding of the text. Indeed, the utilization and interaction of these stated types of inferences are necessary for the actual process of reading. Hence, these inferential moves (i.e., propositional, pragmatic), which are embodied in inferring and background knowledge, occupy a substantive part of textual processing.

Overall, the cognitive view of reading is incarnated in the major procedures and mechanisms involved in the process of grasping the textual input. Considered as a receptive skill, reading entails activating the working memory (i.e., short-term memory,

long-term memory), using information processing skills (i.e., automatic processing, controlled processing), and drawing on interpretive abilities (i.e., critical skills, reasoning heuristics). It is 'a psycholinguistic guessing game' (Goodman, 1982) that necessitates the application of cognitive as well as metacognitive processes. In fact, many reading-related approaches have been developed by reading specialists. For instance, the bottom-up approach, which is advocated by Gough (1976) and LaBerge and Samuels (1985), puts a focal emphasis on the text as the typical source of comprehension, whilst the top-down approach, espoused by many reading researchers such as Goodman (1982) and Smith (1982), essentializes the role of background knowledge in attaining a sufficient comprehension of the written text. In addition, the interactive approach posits that the text content and the readers' hypotheses/predictions significantly contribute to the construction of meaning on a large scale (e.g., Carrell, 1989; Grabe, 1991; Samuels & Kamil, 1984). Emphasizing a similar perspective, the schema-theoretic approach, developed by many reading theorists (e.g., Carrell, 1987; Alderson, 2000; Rumelhart, 1984), gives utmost importance to the readers' prior knowledge as a basic tool of reaching an overall understanding of the target text. Hence, reading is perceived as the critical analysis, synthesis, interpretation, and comprehension of the textual content (Msaddek, 2015).

2.3. The Role of Metacognitive Experience in EFL Reading

Metacognitive experiences denote the conscious thinking processes about any given cognitive task (i.e., reading, speaking, writing). They "*are assumed to occur when cognitions fail during study activities*" (Schneider, 1988, p.53) as a certain comprehension failure or a typical state of confusion can encourage readers to resort to their metacognitive experience, which is basically predicated on metacognitive knowledge. In effect, the remedying of comprehension breakdown by using some 'corrective' strategies can be achieved by learners if they possess thorough metacognitive experience relating to the analysis and synthesis of texts (Msaddek, 2015). This reflects the perspective that when readers do not attain an entire textual comprehension, they endeavor, by being engaged in a metacognitively-based experience, to redirect their unsuccessful attempts with a view to making sense of the assigned text. Within this conceptual framework, Garner (1987) maintains that metacognitive experiences can be described as "*awarenesses, realizations, ahas*" (p.19) of any perceived inability to achieve understanding.

Flavell (1971-1981) confirms that metacognitive experiences are likely to occur before, during, and after reading. In clearer terms, prior to embarking on the reading task, learners can presuppose that being engaged in reading requires some cognitive faculties in order to effectively deal with the text under focus. This presupposition assists readers in tracing an appropriate pathway via which they can understand the printed passage. Further, during textual reading, learners, by being involved in the metacognitive experience, can think about the useful RSs (e.g., planning, inferring, monitoring, evaluating), which can ensure easy access to the text content (Msaddek, 2015).

Additionally, upon completing the reading task, learners can thoroughly reflect on how the task is carried out and rethink the strategies that can contribute to the production of efficient comprehension. Therefore, it is obvious that the learners' metacognitive experience is closely intertwined with their metacognitive knowledge in the process of reading. In this view, Garner (1987) claims that:

[T]he before-reading knowledge tapped relates to a personal strength, the during-reading information is strategy knowledge, and the after-reading knowledge utilized is task information. In all three cases, metacognitive knowledge has served as a base for metacognitive experience. (p.19)

This quotation attests to the fact that metacognitive knowledge does interact with metacognitive experience throughout the process of textual reading. That means that there is a reciprocal, proactive relationship between these two variables (i.e., metacognitive knowledge, metacognitive experience). In essence, metacognitively-oriented experience can be fostered by student-readers via the availability of sufficient metacognitive knowledge and the processing of a wide variety of written passages (e.g., narrative, expository). Thus, the present study will address this issue as it aims at offering adequate strategy instruction to enhance the target EFL learners' metacognitive knowledge and experience of text analysis and meaning construction.

2.4. Comprehension Monitoring in EFL Reading

Comprehension monitoring is regarded as the reflection of a mature, sophisticated form of progress monitoring during the execution of a cognitive task (e.g., reading, writing). It demands the application of executive functioning and control processes for keeping track of the developmental understanding of the content. Without the use of monitoring strategies (i.e., self-monitoring, self-questioning, rereading), learners are likely to encounter comprehension failure, which adversely affects the accurate derivation of text meaning (Msaddek, 2015). Elaborating further on the comprehension monitoring process, Baker and Brown (1984a) state that effective readers have a great awareness of and control over their cognitive and metacognitive strategies. In essence, given that competent readers think critically and retrospectively during textual reading, they can have utter knowledge of what the cognitive task of reading requires from them so as to approach it more perfectly. This typical kind of reasoned thinking equips readers with the robust potential to map a proper pathway through which they can develop an adequate comprehension of the text.

Clearly, Baker and Brown (1984a) set forth many regulatory and metacognitive strategies that serve as critical prerequisites in monitoring textual comprehension. They are embodied in the following steps: (a) clarifying the purposes of reading, that is, understanding both the explicit and implicit task demands, (b) identifying the important aspects of a message, (c) focusing attention on the major content rather than trivia, (d)

monitoring ongoing activities to determine whether comprehension is occurring, (e) engaging in self-questioning to determine whether goals are being achieved, and (f) taking corrective action when failures in comprehension are detected (Baker & Brown, 1984a). These rigorous steps taken by the learners while processing the textual input assist them to conduct an accurate type of reading and to remediate any encountered comprehension breakdown via the use of some “*fix-up strategies*” (Paris & Myers, 1981). In fact, it is unlikely that textual comprehension occurs unless learners immerse themselves in reflecting on the initiated reading strategies and assessing their gradual progression toward the attainment of optimal comprehension. Overall, the comprehension of textual content is predicated on the amount of monitoring accuracy exhibited by the language learners for efficiently self-regulating and assessing their strategic reading behaviors.

2.5. Reading Strategy Instruction (RSI)

It has been proven by a corpus of academic research studies that RSI can contribute to improved reading comprehension (e.g., Block & Duffy, 2008; Dewitz *et al.*, 2009; Duke & Pearson, 2002; Graesser, 2007; Kern, 1989; Li *et al.*, 2022; Msaddek, 2015). In essence, the provision of an efficient sort of strategy instruction makes of learners effective, strategic readers who can conduct the multifaceted process of textual reading in a diligent manner. More specifically, RSI facilitates the operation of internalizing the ‘high-level’ reading-bound strategies amongst learners. This shows that the overriding function of RSI is to initiate the EFL learners into the importance, typologies, and deployment of the text-processing techniques in the hope of enabling them to achieve positive reading gains. Upon receiving RSI, the learners will not only develop and consolidate their metacognitive knowledge as to RSs, but they will also enliven their metacognitive experience, which serves as a springboard for optimally processing, analyzing, critiquing, and comprehending a range of text passages (e.g., narrative, expository).

Many researchers espouse diverse forms of RSI in order to revamp the learners’ meta-strategic moves and reading achievement. These instruction-based forms are manifested in explicit strategy instruction (e.g., Derry & Murphy 1986; Msaddek, 2016; Jones *et al.*, 1987), implicit strategy instruction (e.g., O’Malley & Chamot, 1990; Cohen, 1998), reciprocal teaching (e.g., Palincsar & Brown, 1984; Pressley *et al.*, 1992), self-control training (e.g., Paris *et al.*, 1986), and awareness-training (e.g., Oxford, 1990). These typologies of strategy instruction endorsed by many prominent educational researchers are meant to instill in EFL learners the ‘higher-order’ strategic moves and optimal techniques that assure positive reading outcomes. In this respect, the current study attempts to explicitly instruct two sampled groups of EFL learners (a high school-level group and a university-level group) in (meta) cognitive reading strategies (i.e., planning, predicting, inferring, main idea selection, visualizing, underlining, note taking, monitoring, paraphrasing, and evaluating) with a view to unraveling the feasibility and usefulness of RSI in EFL settings. In other terms, the study will feature whether RSI has

a tangible, positive impact on both high school and university students' reading achievement scores.

As a robust predictor of successful strategic moves that can be initiated throughout the EFL reading act, RSI assists the EFL learners in applying the 'deep-level' reading strategies and restoring understanding in case of any encountered comprehension failure. That is, the implementation of problem-solving heuristics is predicated on the learners' meta-awareness of reading strategy use and their familiarity with the coping techniques that help them deduce the text's embedded meaning readily and efficiently. In this context, a wide plethora of studies have attested to the contribution of metacognitive reading strategy training to the improvement of the learners' reading outcomes (Boulware-Gooden *et al.*, 2007; da Costa, 2022; Kern, 1989; Kit-ling, 2017; Li *et al.*, 2022). These studies, among other ones, indicate that the effective monitoring of textual comprehension, as well as the attainment of significant reading achievement gains, can only be effected through (meta) cognitive reading strategy instruction (CMRSI), which assists the learners to assume cognitive control over the multidimensional process of reading.

3. The Current Study

This quasi-experimental study is intended to showcase the extent to which explicit training in cognitive (i.e., predicting, inferring, main idea selection, visualizing, underlining, note taking, and paraphrasing) and metacognitive reading strategies (i.e., planning, monitoring, and evaluating) can impact the high school-level and university-level learners' reading comprehension outcomes. Based on this postulated perspective, two research questions have been structured:

- 1) To what extent are Moroccan EFL university learners' reading comprehension scores impacted by an explicitness-oriented instruction in (meta) cognitive reading strategies?
- 2) To what extent are Moroccan EFL high school learners' reading comprehension scores influenced by an explicitness-based instruction in (meta) cognitive reading strategies?

In consideration of the two research questions articulated above, two main hypotheses have been crafted:

- 1) It is hypothesized that explicit training in (meta) cognitive reading strategies (CMRSs) improves Moroccan EFL first-semester university learners' reading comprehension scores.
- 2) It is hypothesized that explicit training in (meta) cognitive reading strategies (CMRSs) enhances Moroccan EFL first-year baccalaureate learners' reading comprehension scores.

4. Method

4.1. Participants

The present study addressed four groups of Moroccan EFL learners (n=199). The first two groups (Control Group: n=42; Experimental Group: n=44), whose ages ranged between 16 and 18 years-old, were learners studying at the first baccalaureate level during the academic year: 2013-2014 in a public high school in the city of Salé, Morocco. As for the second two groups (Control Group: n=50; Experimental Group: n=63), they were first-semester EFL university learners undertaking their English Studies at the Faculty of Letters and Humanities- Rabat during the Autumn Semester (2012-2013). They were between 19 and 23 years old. However, it is worth mentioning that some of them, as an exception, were over 23 years-old. The overwhelming majority of the targeted EFL high school-level and university-level learners had almost the same academic background insofar as they started studying English (L3) at the level of junior high school. So, the chief rationale behind drawing a comparison between the high school-level and the university-level learners in terms of the reading achievement scores was to assess the intrinsic usefulness and the potential feasibility of the explicit (meta) cognitive reading strategy instruction (CMRSI) across differing academic EFL settings.

4.2. Procedure

This quasi-experimental study is premised on a qualitative-quantitative research design. It aimed at assigning the pre- and post-tests to all the targeted four EFL groups (high school and university learners). In fact, the undertaken study endeavored to reveal whether cognitive and metacognitive reading strategy instruction (CMRSI) could enable the subjects to gain better grades on reading comprehension tests at the post-testing level. The experimental groups (high school learners (n=44) & university learners (n=63)) received comprehensive training in (meta) cognitive reading strategies (i.e., planning, predicting, inferring, main idea selection, visualizing, underlining, note taking, monitoring, paraphrasing, and evaluating), whereas the control groups (high school learners (n=42) & university learners (n=50)) were not exposed to any type of CMRSI as they studied reading texts in the traditional mode. So, all the groups were pre-tested and post-tested with a view to unraveling the core viability of CMRSI in improving the learners' reading comprehension scores.

Actually, the CMRSI purported to explicitly train the learners belonging to the two experimental groups on the use of cognitive reading strategies (i.e., predicting, inferring, main idea selection, visualizing, underlining, note taking, paraphrasing) as well as metacognitive reading strategies such as planning (goal-setting and background knowledge use), monitoring (self-monitoring, self-questioning, and rereading), and evaluating (recalling and summarizing). The researcher conducted this instructional intervention which is considered as a fundamental step in enabling the EFL student-readers to engage in an effective strategic reading. It is of essential importance in that it

initiated the learners not only into the significance and types of RSs, but also into the basic utilization of these strategies in an attempt to make sense of any textual input, and thus gaining better grades. Therefore, this quasi-experimental study adopts the explicitness-based reading strategy instruction in the hope of enhancing the sampled EFL student-readers' reading achievement scores.

The strategy intervention to which the university learners in the experimental group were exposed lasted for a semester-long period (Autumn Semester: 2012-2013). In the first session, the targeted subjects of both the control and treatment groups were assigned a reading pre-test including an advanced-level written discourse that was accompanied by a set of tasks (i.e., wh-questions, meaning-infering, paraphrasing, summarizing). As regard to the subsequent sessions, the treatment group was instructed in reading comprehension by furnishing them with an enabling corpus of (meta) cognitive reading strategies and encouraging them to apply them in the course of deciphering the textual content. Indeed, explicit training in (meta) cognitive reading strategy use was basically intended to get the learners in the treatment condition acquainted with the view that the cognitive process of reading can be efficiently undertaken through the implementation of (meta) cognitive heuristics (i.e., planning, predicting, inferring, main idea selection, visualizing, underlining, note taking, monitoring, paraphrasing, and evaluating). Thus, the learners' exposure to the core importance of CMRSs and their application to a diversity of 'experimental' written texts, which were designated by the researcher, can heighten their overall awareness of the major mechanisms involved in textual reading. The control group, which was not instructed in CMRSs, took their normal classes by being exposed to other different reading comprehension texts. At post-testing, both groups (i.e., control, experimental) were assigned the reading comprehension test coupled with multiple tasks (i.e., wh-questions, meaning-infering, paraphrasing, summarizing).

Further, the same strategy intervention delivered to the university-level learners in the treatment condition was received by the high-school level students belonging to the experimental group. Both the control and treatment participants were administered the same pre- and post-tests taken by the university learners. After the conduct of the pre-testing, the researcher explicitly instructed the treatment subjects in the primary significance, typologies, and deployment of CMRSs via processing the reading comprehension texts for a three-month period (from mid-February through mid-May) during the academic year: 2013-2014. Indeed, an additional two-hour session per week was devoted to this undertaken experiment apart from the regular sessions attended by the learners. The participants in the treatment group were provided with the same reading texts assigned to the university experimental group. Noteworthy is the fact that the high school learners in the experimental condition were exposed not only to the reading texts used in the experiment but they were also instructed in the reading passages incorporated in the EFL textbook, *Ticket to English*. The latter encapsulates insightful and attractive reading texts that suit the language proficiency level of the learners. As regards

the control group, it was exposed to the normal teaching of EFL reading comprehension texts that are embedded in *Ticket to English*. At the end of the treatment, both groups (i.e., control, experimental) were administered the reading comprehension post-test for measuring the effect of the (meta) cognitive reading strategy training on the obtained grades amongst the strategy-trained group.

The gathered data were analyzed through the SPSS Software Program (Version 16.0). Both descriptive and inferential statistical analyses were carried out to reveal whether the reading comprehension scores gained by the high school-level and the university-level learners substantially improved after the conduct of the (meta) cognitive reading strategy instruction (CMRSI). Indeed, the reading comprehension scores obtained by the university learners (i.e., control group (n=50); treatment group (n=63)) as well as the high school learners (i.e., control group (n=42); treatment group (n=44)) were submitted to statistical analysis by using the independent samples t-test with a view to foregrounding the obtained means, standard deviations, mean differences, and the significance levels at both pre-testing and post-testing levels.

5. Results

5.1. EFL University Learners' Reading Comprehension Outcomes at the Pre- and post-testing Levels

5.1.1. University Learners' Reading Comprehension Gains at Pre-testing

The resultant output of the Independent Samples *t*-test indicates that the discrepancy between the control and the experimental groups in terms of the reading achievement scores is starkly non-significant. The following tables presented below plausibly manifest the reached results.

Table 1: Descriptive Statistics on Reading Achievement Scores on Pre-testing

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
Reading Performance	Control	50	5.9600	3.27302	.46287
	Experimental	63	4.8492	3.16181	.39835

Table 2: The Independent Samples *t*-test for the Target Groups' Reading Achievement at Pre-testing

Independent Samples <i>t</i> -Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Reading Pre-test	Equal variances assumed	.186	.668	1.826	111	.071	1.11079	.60824	-.09448	2.31606
	Equal variances not assumed			1.819	103.563	.072	1.11079	.61069	-.10028	2.32187

$P < .05$

As explicitly featured above, the statistical analysis performed reveals that the observable difference between the two means (control group: Mean= 5.96; experimental group: Mean=4.84) gained by the university-level treatment and control groups is (1.110) with a *t*-value of (1.826). This does not yield any noticeable statistical significance at the level of the mean variance (.071) at pre-testing. Though the learners in the control group reflected slight reading outperformance as to the mean score compared to the treatment group participants, the notable disparity between their reading performance grades on the reading comprehension pre-test is beyond the set probability value (.05).

5.1.2. University Learners' Reading Comprehension Gains at Post-testing

At post-testing, it is obvious that after receiving the explicit metacognitive reading strategy training, the experimental groups revealed major improvements at the level of reading comprehension outcomes. The output generated through the independent samples *t*-test showcases that the experimental group attained a higher mean on reading comprehension test than the control group did. This is illustratively manifested in the ensuing tables.

Table 3: Descriptive Statistics on Reading Achievement Scores on Post-testing

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
Reading Performance	Control	50	5.6500	2.81441	.39802
	Experimental	63	10.6667	2.80121	.35292

Table 4: The Independent Samples *t*-test for the Target Groups' Reading Achievement at Post-testing

Independent Samples t-Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Reading Post-test	Equal variances assumed	.086	.769	-9.436	111	.000	-5.01667	.53166	-6.07019	-3.96315
	Equal variances not assumed			-9.431	105.029	.000	-5.01667	.53195	-6.07142	-3.96191

P < .05

Upon being exposed to explicit training in (meta) cognitive reading strategies (CMRSs), the experimental group's reading achievement scores did advance substantially. The results obtained via the independent *t*-test run show that the observed difference between the means of both groups (i.e., control, experimental) was of potential statistical significance. Whereas the participants in the control group achieved a mean score of (5.65) at post-testing, the group in the experimental condition obtained a significantly higher mean score of (10.66). The difference between the means of both groups appears to be significant at (.000) with a *t*-value of (-9.436). The treatment groups exhibited incremental advances at the mean score level (Pre-test: M=4.84, SD=3.161; Post-test: M=10.66, SD= 2.801). In fact, the mean difference observed at post-testing did yield a significance level of (.000).

5.2. EFL High School Learners' Reading Comprehension Outcomes at the Pre- and Post-testing Levels

5.2.1. High School Learners' Reading Comprehension Gains at Pre-testing

The results of the independent samples *t*-test conducted show that the difference between the participants in the control condition and those in the treatment condition is not statistically significant at pre-testing. The generated output of the statistical analysis conducted is foregrounded in the ensuing tables.

Table 5: Descriptive Statistics on Reading Achievement Scores on Pre-testing

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
Reading Performance	Control	42	4.9881	1.80611	.27869
	Experimental	44	4.4773	2.20716	.33274

Table 6: The Independent Samples t-test for the
 Target Groups' Reading Achievement at Pre-testing

Independent Samples t-Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Reading Pre-test	Equal variances assumed	.905	.344	1.171	84	.245	.51082	.43606	-.35633	1.37797
	Equal variances not assumed			1.177	82,111	.243	.51082	.43403	-.35259	1.37424

P < .05

As manifested above, there is no plausible statistical difference between the participants in both the control and experimental groups in terms of the mean scores attained prior to the conduct of the explicit training in (meta) cognitive reading strategy use. Clearly, whilst the mean relative to the reading comprehension tests taken by high school-level learners in the control condition is 4.98 (SD=1.806), the mean score obtained by their experimental counterparts is 4.47 (SD=2.207) with a *t*-value of (1.171). This did not produce any manifestly statistical significance between the two gained means (.245) at the pre-testing stage. In effect, the manifest discrepancy between the two EFL groups (i.e., control, experimental) at the mean score level is not within the parameters of the set probability value (.05).

5.2.2. High School Learners' Reading Comprehension Gains at Post-testing

The independent samples *t*-test run provides tacit evidence that there is no markedly notable statistical disparity between the two EFL high school-level groups in both conditions (the control condition and the experimental one). The results attesting to this stated fact are presented in the two tables below (Table 7 & Table 8).

Table 7: Descriptive Statistics on Reading Achievement Scores on Post-testing

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
Reading Performance	Control	42	5.1905	1.72483	.26615
	Experimental	44	4.7614	2.16604	.32654

Table 8: The Independent Samples *t*-test for the Target Groups' Reading Achievement at Post-testing

Independent Samples t-Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Reading Post-test	Equal variances assumed	.737	.393	1.013	84	.314	.42911	.42349	-.41304	1.27127
	Equal variances not assumed			1.019	81.422	.311	.42911	.42127	-.40901	1.26723

$P < .05$

The tabulated results elucidate the premise that the undertaken experiment on the use of (meta) cognitive reading strategies did not produce any observed statistical significance as to the reading comprehension scores obtained both EFL groups (i.e., control, experimental) at post-testing. The difference between the means achieved by both of these two high school-level groups is of negligible importance since no tangible advance did mark the reading performance of the targeted EFL subjects. Following the (meta) cognitive strategy intervention, the control and the treatment groups achieved means of ($M=5.19$, $SD=1.724$) and ($M=4.76$, $SD=2.166$) with a mean difference of (.42911) respectively. This ultimately yielded an apparent non-significance level of (.314) with a *t*-value of (1.013). Noteworthy is the fact that, though both high school-level groups slightly progressed from the pre- to the post-test in terms of the mean scores (Control group: Pre-test: $M=4.98$; Post-test: $M=5.19$; Experimental group: Pre-test: $M=4.47$; Post-test: $M=4.76$), the difference between the means on the post-test is beyond the stated significance level (.05). Thus, it is deducible that the causal link correlating explicit training in CMRSs with the high school learners' reading achievement grades is insignificant and non-existent.

6. Discussion

The current study was undertaken during the process of conducting my PhD research (from 2010 to 2015) on the effect of explicit instruction in cognitive and metacognitive reading strategies (CMRSs) on the English department learners' strategy use and reading comprehension scores. In fact, this experiment-oriented study aimed at drawing a distinction between the reading comprehension outcomes gained by the English department first-semester students and the ones obtained by the first-year baccalaureate students before and after the conduct of the (meta) cognitive reading strategy training.

Uncovering the dynamic interplay between the deployment of self-regulatory reading strategies (i.e., planning, predicting, inferring, main idea selection, visualizing, underlining, note taking, monitoring, paraphrasing, and evaluating) and the EFL learners' reading comprehension scores in differing EFL contexts (university and high-school contexts) is of intrinsic value for the promotion and amelioration of reading comprehension instruction.

As far as the first experiment is concerned, it is obvious to state that the attained research findings are a manifest attestation to the core role of CMRSI in revamping the EFL university learners' reading comprehension outcomes at the post-testing stage. Granted the apparent function of the CMRSI in the expansion of the experimental EFL university-level learners' knowledge pertaining to CMRSs to which they were exposed throughout the semester-long intervention, it is significant to state that marked efficiency in text processing was proven to be the ultimate outcome among the target EFL subjects. This utmost effectiveness which underpinned their reading achievement, is certainly bound up with the extent to which the participating experimental group was exposed to the explicit (meta) cognitive strategy training. However, the EFL learners in the control condition did not manifest any developmental progress at the level of the reading performance scores from the pre- to the post-test level.

The increased trend among the university-level treatment group to perform significantly better than the controls can be expounded by the critical importance of the role of CMRSI. The latter did induce the learners to call upon a set of 'heuristics' that can be applied either unconsciously (e.g., predicting, inferring, main ideas selection, visualizing, underlining, note taking, paraphrasing) or deliberately (planning, monitoring and evaluating strategies). Thus, it is only via the assignment of reading texts that are typically difficult in content that the reinforcement of these cited strategies can be achieved. In considering the fact that some of the taught strategies entail reasonable thinking and self-regulation while other techniques can be utilized unconsciously, it is obvious that the conduct of CMRSI and the analysis of varied written texts designated by the researcher across the semester-long intervention contributed to making of the EFL students of the experimental group effective 'strategy users'. This is valid evidence that the target learners' reading performance did improve through the strategy-based training. Within this frame, prior research studies (e.g., Kane *et al.*, 2014; Li *et al.*, 2022; Shuqin & Kamarudin, 2023; Yapp *et al.*, 2021) attest to the effective feasibility and marked efficiency of the reading strategy instruction in the EFL university context.

Actually, the strategy-trained learners' metacognitive knowledge relative to differing meaning-building strategies culminated in raising their reading performance to a refined level. That is, the enhancement of the experimental group participants' reading achievement gains was markedly manifested in the four tasks incorporated on the reading post-test. The provision of relatively accurate responses to the wh-questions in the first task by the overwhelming majority of the EFL subjects reflected a certain degree of progressive development in their reading abilities and text processing as the treatment

group seemed to nurture the potential of reading the assigned texts included in the post-test more 'planfully' and 'critically'. They tended, in a way, to invoke and put into action the instructed cognitive and metacognitive reading strategies (CMRSs) with the main goal of unraveling the textual content, and thus stating the right response to each corresponding question.

Further, it is worth elaborating that, despite the fact that some university-level learners of the experimental group seemed to replicate the texts' ideas and statements in order to answer the set comprehension questions, they did achieve the intended comprehension outcomes. This process of restating the textual statements per se can be ascribed to the mere deficiency in some vocabulary items. Indeed, insufficient knowledge of lexicon can hinder the EFL learners' capability of coming up with their own terms to respond to the text comprehension questions in an effective manner. But, it is of particular relevance to posit the premise that the strategy-instructed EFL student-readers did show a substantive increase in terms of text synthesis and content comprehension.

Regarding the second task, which relates to the meaning-inferring process, it was apparent that the majority of the participants in the university experimental group showcased an improvement in the level of inferential thinking on the post-test. One likely interpretation for this gradual development in inferring the target meaning of the given concepts can be due to the EFL learners' overreliance on the context in an effort to figure out the connotation of the given terminologies. Thus, the experimental group's performance in the meaning-inferring task at post-testing, compared to that related to the pre-test, revealed that a significant measure of enhancement in regard to the process of selecting the proper equivalent concepts occurred. However, drawing a comparison between the meaning-inferring performance of the control subjects at the pre-test with that of the post-test indicated that most of the learners seemed to fail, at times, to opt for the accurate synonymous terms.

With respect to the paraphrasing task, the university-level experimental group reflected a certain kind of tendency towards attempting to restate the given sentences in their own terms. This is, in effect, in total contrast to their paraphrasing performance at pre-testing in which they provided a rather exact replica of the set forth statements. Moreover, it is worth indicating that, whilst the control group did manage, in a way, to reword the assigned statements without reflecting any effectiveness, the experimental subjects, owing to their exposure to similar tasks during the training intervention, seemed to advance in their paraphrasing 'heuristics' both quantitatively and qualitatively. However, this does not preclude the fact that a tiny minority of the treatment subjects, at times, failed to put forth the synonymous words while attempting to paraphrase the assigned statements at post-testing. Generally, the intervention group did succeed in keeping the core meaning of the sentences set in the paraphrasing task of the post-test.

In a similar vein, the performance of the summary task among the strategy-instructed EFL first-semester group was also marked by a certain amount of efficacy and conciseness. Basically, most, if not all, the experimental subjects attempted to avoid

stating the same content of the text per se. They featured their analytical and interpretive 'heuristic' processes with the intent of summing up the entire text with better clarity. Further, in the course of summarizing the content of the given text at post-testing, a great percentage of the treatment EFL learners endeavored to involve their background knowledge as an optimal medium of putting forth an efficiency-oriented summary. This can be expounded by postulating that the strategy of summarizing, as an evaluating strategic move, was not applied in isolation, but rather a varied combination of strategies was made recourse to by the target subjects for the sake of achieving adequacy in textual understanding.

In regard to the second experiment, which addressed high school students, it was clear that the research outcomes did not correlate significantly with the conducted CMRSI. More specifically, the reading achievement gains of the experimental high school-level group did not substantially increase across the pre-post-test continuum. This shows that the high school-level learners' exposure to CMRSI was plainly ineffective insofar as the strategy-trained group did not outperform its counterpart (the control group) at post-testing. Thus, the refinement of the EFL high school learners' reading comprehension outcomes is based on the application of other extensively used methods of teaching EFL reading, such as the SQ3R method (Survey, Question, Read, Recite, Review), the SQ4R method (Survey, Question, Read, Recite/ or Respond, Record, Review), or the three-stage method (i.e., pre-reading, while-reading, post-reading stages) which are recommended by many reading researchers (e.g., Alqarni, 2015; Amroji, 2021; Churat *et al.*, 2022; Jin *et al.*, 2020; Khusniyah, 2020; Masharipova & Mizell, 2021; Nabilla & Hadi Asmara, 2022; Nafi'ah *et al.*, 2022; Widiani, 2021) for instructing reading comprehension and promoting collaborative reading among EFL high school learners. This can be accounted for by stating that most of the CMRSs explicitly instructed throughout the instructional intervention were not grasped by the high school learners as they kept asking about their meanings. In effect, according to the results gained in light of the conduct of these two experiments, it can be declared that explicit training in CMRSs is applicable and productive at the university rather than at the high-school level.

Indeed, the targeted EFL high school learners (the control & treatment groups) did encounter some difficulties in constructing the textual meaning of the pre-test as well as the post-test. This is a marked indication that the learners at the high-school level are of differing reading abilities and varying language proficiency levels. Considering that the vast majority of them started studying English as a foreign language (EFL) at the junior high school level, it was apparent that they struggled with both the deciphering of the vocabulary items and the identification of the textual message. For clarification purposes, most of the participants of the two groups in both conditions (i.e., control, experimental) not only encountered comprehension breakdown on the reading pre-test and post-test, but they also failed to derive the core meaning from the reading texts included in both tests (i.e., pre-test, post-test). This was manifested in the fact that the overwhelming proportion of the targeted high school learners intentionally skipped some difficult

comprehension wh-questions and other items relative to the meaning-infering task and the paraphrasing task. The summary task was also ignored by the majority of the participants (the control and treatment groups).

In this context, Block (1992) tends to demonstrate how the process of comprehension monitoring is undertaken among L1 and L2 student-readers (both proficient and less proficient). Her findings revealed the evidence that most readers could identify the problems presented in the written text (e.g., the referent problem and the vocabulary problem). Block (1992) further states that proficient student-readers can pinpoint the problems more regularly than do the less proficient ones. This reflects the view that proficiency and efficiency in reading, be it in L1 or L2, is an important element that can facilitate the process of monitoring text comprehension. Hence, the findings reached in light of the conduct of these two experiments at both the high school and the university levels within the Moroccan EFL setting are in accordance with the ones foregrounded by Block (1992). Clearly, language proficiency, coupled with cognitive and metacognitive reading strategy instruction, can yield positive results in terms of reading comprehension achievement among EFL learners.

Further, a large body of research discloses that older and more skilled readers are better monitors of comprehension than younger and poorer readers (Li *et al.*, 2021; Pitts, 1983). This amply shows that the primary factors of age and proficiency level play a significant part in the actual development and improvement of the process of comprehension monitoring in reading written texts among learners. To put it differently, these two stated factors (i.e., age, proficiency) can enable learners to efficiently process the text content by monitoring their ongoing understanding and assessing their progress towards attaining fuller, more sufficient comprehension. Thus, it can be declared that EFL high school learners face a series of comprehension-related difficulties throughout the actual process of reading advanced-level EFL written passages. That means that the processes of activating the learners' content, cultural, and formal schemata and pre-teaching vocabulary through semantic mapping at the pre-reading stage can pave the way for the learners to understand the difficult words encountered in the written text under study and make efficient sense of its core theme. Hence, the hypothetical assumption that explicit CMRSI can revamp the reading comprehension scores gained by high school learners in an EFL context is disconfirmed.

It is evident, then, that the university-level experimental group's text-analysis performance, namely at the post-testing stage, was characterized by effectiveness and refinement. A starkly huge disparity can be observable between the pre- and the post-test achievement outcomes. This, by almost all accounts, highlights the role of CMRSI in enabling the targeted EFL university group to base their conducted reading act on a multiplicity of variables which are embodied in metacognitive knowledge, metacognitive experience, and strategy use. In clearer terms, insofar as the strategy instructional intervention was emphasized and initiated, the learners in the strategy-instructed group extensively expanded their knowledge pertaining to differing RSs. Further, they

experienced many cognitive failures in comprehension which strengthened their reading potentialities, and thus helped them deploy some potent meaning-construction strategies. In effect, the interplay of these variables (i.e., metacognitive knowledge, metacognitive experience, strategy use) can be regarded as the significant determinant of higher achievement gains as concerns textual synthesis and content comprehension. The attribution of the development of the reading potential and monitoring capacity of learners to the metacognitive strategy training is validated by the significantly higher scores gained by the treatment group at post-testing. Hence, the reached findings are congruent with prior research results (e.g., Dole *et al.*, 1996; Kane *et al.*, 2014; Shuqin & Kamarudin, 2023; Morshedien *et al.*, 2017; Yapp *et al.*, 2021). This state of affairs provides an affirmative confirmation of the set hypothesis which assumes that explicit instruction in CMRSs culminates in the enhancement of EFL university learners' reading comprehension scores.

7. Conclusions & Implications

The current experimentally-oriented study intended to draw a distinction between the reading achievement scores attained by the English department first-semester students and the ones obtained by the first-year baccalaureate students both before and after the adopted instructional intervention. The findings reached tacitly showcased that the intrinsic value of the explicit CMRSI in the university setting is to be fundamentally underscored as it plays a functional, unparalleled role in further improving the EFL university-level learners' reading comprehension outcomes.

In the university context, it is noteworthy that, given that the control group was only exposed to the analysis and interpretation of reading texts that did not reflect, to some extent, the difficulty level of those texts studied by the experimental group during the training period, and granted that the control group was not instructed in CMRSs, it is of great interest to highlight the essential role of CMRSI in assisting the treatment EFL learners to be highly strategic, critical readers. Hence, only via drawing a comparison between the reading comprehension gains of both EFL university-level groups from the pre- to the post-test can the crucial worth of CMRSI be manifested to a more substantial degree in the course of reading comprehension as a fruitful discipline in EFL learning in general and in reading strategy acquisition in particular.

With respect to the high school setting, it can be stated that though the experimental participants were explicitly instructed in CMRSs, they did not achieve higher grades compared to the control participants on both pre- and post-testing. This manifests that explicit CMRSI is far from effective at the level of improving the EFL high school students' reading comprehension outcomes. In fact, in light of the reached findings, CMRSI proved unproductive and inefficient in the high school setting. As some educationalists and reading researchers (e.g., Carlston, 2011; Churat *et al.*, 2022; Jin *et al.*, 2020; Widiani, 2021) postulate, the high school-level learners should be taught EFL

reading comprehension via such methods as the SQ3R method (Survey, Question, Read, Recite, Review), the SQ4R method (Survey, Question, Read, Recite/ or Respond, Record, Review), or the three-stage method (i.e., pre-reading, while-reading, post-reading stages) which are widely adopted and implemented by the majority of high school teachers in the Moroccan EFL context.

Indeed, the teacher education programs offered to EFL pre-service teacher trainees highlight the essentiality of the above-stated methods of instructing EFL reading to Moroccan EFL high school-level learners. Obviously, those reading methods (i.e., the SQ3R method, the SQ4R method, the three-stage method) can indirectly optimize the learners' processing capacity and improve their meta-awareness of text analysis and reading comprehension. Yet, this does not preclude the overriding importance of including the implicit reading strategy instruction in the reading sessions for assisting the high school learners to unconsciously internalize the reading strategies (i.e., cognitive, metacognitive). In fact, since most high school learners struggle with grasping the EFL input and find some difficulties in understanding some concepts in the EFL reading texts as well as in deciphering the meaning of some generic RSs (i.e., predicting, inferring, visualizing, monitoring, self-questioning, recalling), implicit/embedded instruction of RSs can serve as a gateway into automatically strengthening their strategic reading behaviors.

Based on what has been stated thus far, it is implied that explicit CMRSI should be incorporated in the Reading Comprehension Course in tertiary education. Equipping EFL university learners with an overall framework of the importance, typologies, and application of the basic (meta) cognitive reading strategies (CMRSs) and enabling them to approach texts of diverse types (e.g., narrative, expository) can be the essential hallmarks of attaining the required level of reading efficacy which is predicated on efficient strategy use and adequate accuracy of comprehension monitoring. The qualitative improvement of the university-level experimental group's reading performance and the somewhat stagnant reading achievement gains exhibited by high school learners in both conditions (i.e., control, experimental) from the pre- to the post-test sessions can be ample evidence of the positive impact of the CMRSI on the university-level learners' monitoring abilities and strategic behavior for gaining better reading comprehension outcomes. Had they not been exposed to the reading 'heuristics', which govern text processing in all of its manifestations, the experimental university EFL group would unlikely have outperformed its counterpart, the control group, at post-testing. Overall, the method of teaching EFL reading comprehension to university-level learners is totally different from the one applied in EFL high school contexts since the reading texts assigned to the students at the tertiary education level entail deep-level processing strategies and high-order thinking skills.

Additionally, it is recommended that reading comprehension instruction at the high school level be predicated on the application of the SQ3R method (e.g., Carlston, 2011; Nabilla & Hadi Asmara, 2022; Robinson, 1970), the SQ4R method (e.g., Churat *et al.*,

2022; Pauk, 1984), or the three-stage method (e.g., Amroji, 2021). These stated reading-oriented methods, along with other crucial techniques which involve using semantic mapping, brainstorming, pre-teaching vocabulary, and cultivating reading skills in an implicit/ indirect manner, are some of the major guidelines and the core prescriptions set forth in the high school curriculum for the promotion of English language learning amongst Moroccan EFL high school students. Thus, the inclusion of warm-up activities (i.e., brainstorming, pre-teaching vocabulary) in any reading session is of paramount importance for engaging EFL high school learners in textual processing and enhancing their reading achievement.

As regards the university-level reading comprehension instruction, it is worthwhile to alert the learners, namely those studying at the first-semester stage, to the essentiality, typologies, and application of the CRSs (e.g., predicting, inferring, main idea selection, visualizing, underlining, note taking, paraphrasing) and MRSs (goal-setting, background knowledge use, self-monitoring, self-questioning, rereading, recalling, summarizing). In this way, the EFL learners' processing mode in reading and their text-analysis skills already nurtured in high school can be incrementally consolidated. Only via being exposed to the multifaceted nature of the RSs (i.e., cognitive, metacognitive) is it possible that EFL university-level learners' strategy awareness and application will be further enhanced, and thus augmenting their reading comprehension outcomes. This can allow them to undertake a sophisticated kind of metacognitive reading by critically analyzing and reasonably processing the textual input for achieving deeper, more robust understanding of the advanced-level EFL written texts.

Though the current two experiments present insightful views pertaining to EFL reading strategy instruction from a metacognitive angle, some limitations are worthy of mention. One limitation is related to the fact that the conducted research study was restricted to the Faculty of Letters and Humanities in Rabat and a public high school in Salé. Thus, extant research is needed to further corroborate the attained research outcomes by targeting other Moroccan higher education institutions as well as other Moroccan public high schools across different geographical areas. The other limitation is germane to the gender variable which can be regarded as an intervening factor. Granted that the current study was intended to draw parallels between the high school and university learners at the level of reading comprehension scores before and after the delivery of the (meta) cognitive reading strategy intervention, it did not differentiate between reading scores obtained by the male as opposed to the female participants of the four groups under study. This research endeavor of investigating the EFL learners reading achievement before as well as after the instructional intervention from a gender perspective, which was beyond the parameters of this quasi-experiment, could be addressed by future researchers.

Conflict of Interest Statement

The author declares no conflicts of interest.

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STRATEGIES ON MOROCCAN EFL LEARNERS' READING COMPREHENSION SCORES IN ENGLISH (L3):
A COMPARISON BETWEEN HIGH SCHOOL-LEVEL AND UNIVERSITY-LEVEL STUDENTS

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