EFL Learners' Written Lexical Retrieval Ability as Predicted by Cognitive and Metacognitive Strategies of Self-regulation

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Abstract

This study examined whether metacognitive and cognitive strategies of self-regulation capability in English as a foreign language (EFL) learners can predict their written lexical retrieval ability in English. The participants were 93 intermediate Iranian EFL learners. Pintrich's self-regulated learning (SRL) model was adopted as a basis in this research. There are cognitive, metacognitive, affective, motivational, social, and environmental factors at play in this model. The data were collected through Written Productive Translation Task (WPTT) and Motivated Strategies for Learning Questionnaire (MSLQ); however, only its learning (metacognitive and cognitive) strategy use scale was analyzed. The results of multiple regres-

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sion analyses showed that both metacognitive and cognitive strategies of self-regulation could significantly predict the participants' ability to retrieve English written words, but the role of metacognitive strategies was larger. This can guide EFL teachers on how to promote lexical learning, retention and retrieval ability of their students through explicitly teaching them cognitive and particularly metacognitive strategies.

Keywords: Self-regulation, Self-regulated Learning Model (SRL), EFL Written Lexical Retrieval, Cognitive Strategies, Metacognitive Strategies.

Introduction

In addition to orthographical, phonological, etc. networks, the lexicon is organized in the brain as a set of the semantic network of interconnected concepts (i.e., nodes) connected (Carroll, 2008). On the other hand, lexical retrieval is a sub-skill of and a crucial process in both written and oral language production and a significant dimension of fluency in second language (L2) learners (Snellings et al., 2004). According to the revised spreading activation model (Bock & Levelt, 1994), lexical retrieval entails the selection of lexical concepts that leads to lemmas representing and containing the syntactic and semantic features of a word and lexemes including the formal and morphological (i.e., orthographic or phonological) ones. In other words, the concepts are phonologically, morphologically, and phonetically encoded to be either written down or articulated (Levelt, 1989; Levelt et al., 1999; Roelofs, 2003). As for native speakers, these features are greatly integrated into a lexical entry if words are not specific to a discipline or of low frequency (Levelt, 1989). However, L2 learners, particularly in an English as a foreign language (EFL) context, usually do not receive enough contextualized language input; thus, they cannot extract, create, and integrate these features into a lexical entry (Jiang, 2000). According to Jiang, because learners have a semantic system in their first language (L1) and probably depend on this system when learning a new L2/EFL word, the integration process may be impeded; thus, L2/EFL lexical retrieval may face problems.

Considering the above discussion on the conscious and controlled process of L2/EFL lexical retrieval (e.g., Gulan & Valerjev, 2010; Jiang, 2000), learners might be able to enhance their L2/EFL lexical retrieval ability and cope with its problems through resorting to some learning strategies. Since self-regulation is considered as a broader construct than learning strategies (Oxford, 2011, as cited in Chamot, 2014), it seems warranted to assume that learners' use of self-regulatory strategies can contribute to their L2/EFL lexical retrieval ability as their self-regulation ability proved to enhance their L2/EFL vocabulary learning (e.g., Hardi, 2014; Mizumoto, 2010). Self-regulation means self-generated feelings, thoughts, actions, and behaviors that are pre-planned and then modified during the task performance in order to attain one's goals (Zimmerman, 2008). Accordingly, in *self-regulated learning* (SRL), learners set goals, plan strategically, select and use strategies, monitor their effectiveness and evaluate their performance (Zimmerman, 2008).

Cognitive (i.e., elaboration, rehearsal, and organizational) of self-regulation and metacognitive strategies (metacognitive self-regulatory strategies and critical thinking) and– as defined in Pintrich's (2000) model of SRL – are among self-regulatory strategies that can improve the chance of learning L2/EFL lexical items (Cubukcu, 2008; Dörnyei, 2005; Field, 2004; Gu & Johnson, 1996; Pavičić, 2008; Schmitt, 1997; Wolters et al., 2005), and they may do so later in retrieving them successfully. Cognitive strategies show the use of learning strategies to understand the material in any course (Pintrich, 2004; Schunk, 2005). Likewise, learners use metacognitive strategies to change or adapt their cognition (Wolters et al., 2005). In other words, its metacognitive and cognitive strategies of self-regulation might facilitate L2/EFL lexical retrieval as it has also been proved that self-regulation ability contributes to L2/EFL vocabulary learning (e.g., Hardi, 2014; Mizumoto, 2010).

The present article, therefore, seeks to investigate whether metacognitive and cognitive strategies of self-regulation in Pintrich's (2000) SRL model can predict EFL learners' written lexical retrieval ability. In other words, it aims to investigate this research question:

Is there any significant relationship between metacognitive and cognitive strategies of self-regulation ability in EFL learners and their English written lexical retrieval ability?

Review of Literature

Pintrich's (2000) SRL Model and L2/EFL Vocabulary Learning

There are different models of self-regulation, and all SRL models have the components of cognition, metacognition, and motivation (Zimmerman, 2008). In Pintrich's (2000) model, self-regulation entails the control of cognitive, metacognitive, affective, motivational, behavioral, social, and environmental factors (i.e., learning context) (Schunk, 2005). According to Pintrich (2004), areas of regulation consist of affect/motivation, cognition, behavior, and learning context, and the phases of regulation are: (1) planning, forethought, and activation, (2) monitoring, (3) control, and (4) reflection and reaction.

In the first phase, cognition contains background and metacognitive knowledge, and goals. During this phase, motivational elements such as one's understanding of learning ease or difficulty, self-efficacy, goal orientations, interest and task value are subject to self-regulation. Planning effort and time and planning for observing one's behavior are considered self-regulated behaviors. Contextual factors in this phase are learners' understanding of the task and its context. In the second phase, namely monitoring, learners try to pay attention to and be aware of their actions and their results. To Pintrich (2000), cognitive monitoring includes metacognitive awareness and judgments of one's learning. Monitoring motivation implies awareness of one's values, interests, self-efficacy, and anxieties as well as causes of the obtained results. Likewise, monitoring behaviors involves adjusting and managing time and effort. Contextual monitoring entails monitoring task conditions to find out whether they are

changing or not. During the control phase, learners try to control their cognition, behaviors, motivation, and context through their monitoring in order to improve learning. Cognitive control includes metacognitive and cognitive activities that aim to modify their cognition (Pintrich, 2000). Control of motivation consists of self-efficacy through talking to oneself positively. Control of behavior includes making efforts persistently and asking for help when necessary. Contextual control means strategies such as eliminating or reducing distractions to make the context lead to learning. Learners' reactions and reflections involve attribution of either success or failure to various causes, and evaluations of performance (Pintrich, 2000). Motivational reactions are attempts to improve motivation when it has been reduced. Behavioral reflection and reaction entail knowledge about one's actions, e.g., whether one has made enough effort or used time well (Schunk, 2005).

As mentioned above, to Pintrich (2000), self-regulation includes metacognitive self-regulatory, cognitive, and resource management strategies. The metacognitive and cognitive strategies, lying in the area of cognition in Pintrich's (2000) model, can play a part in L2/EFL vocabulary learning. In his model, cognition encompasses elaboration, rehearsal, and organizational, critical thinking, and metacognitve self-regulatory strategies (Pintrich, 2004). Rehearsal strategies entail; for example, repeating or reciting L2/EFL vocabulary items in a list when acquiring them; this is a kind of shallow processing (Gu & Johnson, 1996; Wolters et al., 2005). Elaboration strategies that form a deeper approach to learning also play a vital role in storing information; for instance, storing L2/EFL vocabulary items in long-term memory through generating internal links between them (Dörnyei, 2005; Gu & Johnson, 1996; Wolters et al., 2005). As recalling a learned vocabulary item needs deeper processing, elaboration will help the information (e.g., L2/EFL words) to enter the long-term memory and to be retrieved more easily later (Loftus & Loftus, 1976; Sperling, 1967). This is what is referred to by Field (2004, p. 167) as well, "The ease with which a memory is retrieved from LTM [long-term memory] is determined by how strongly encoded it is." Elaboration strategies include analogy-making; for example, when learning new L2/EFL words. According to analogy theory, "[W]ords are interpreted phonologically by analogy with others, perhaps mainly on the basis of their rhyme," (Field, 2004, p. 95). Using organizational strategies which also involve some deeper processing, learners choose proper information and organize whatever they have learned (Pintrich, 1999; Wolters et al., 2005). This can be extended to the acquisition and retrieval of lexical items which involve "analysis, classification, and interpretation of a stimulus" (Field, 2004, p. 224).

Metacognitive strategies of self-regulation in Pintrich's (2000) model of SRL – other strategies in its area of cognition– include critical thinking and metacognitive self-regulatory strategies (Pintrich, 2004). Critical thinking consists of knowing the source of information, pondering whether that information is compatible with their background knowledge, and judging the information critically (Linn, 2000). It is also noteworthy that self-regulation lies at the core of critical thinking (Facione,1990), and according to American Philosophical Asso-

ciation Project, critical thinking is a kind of self-regulatory judgment that leads to evaluation, inference, analysis, and interpretation (Facione & Facione, 1996). Concerning how this definition of critical thinking can be related to L2/EFL vocabulary learning and subsequent retrieval, Pavičić (2008) maintains that through learning diary that is a vocabulary learning strategy, learners will undertake critical evaluation of their own activities. Metacognitive self-regulatory strategies reflect activities that help learners pre-plan, observe, and modify their learning process (Pintrich, 2004). To Gu and Johnson (1996), an example of metacognitive self-regulation in vocabulary learning is selective attention that is a psycholinguistic concept indicating "an ability to tune in to certain sources of input and exclude others," (Field, 2004, p. 24). In the case of L2/EFL vocabulary learning, it involves strategies concerning how to select a word to be studied; for example, the L2/EFL language learners look up worthwhile words. In other words, learners who utilize metacognitive strategies know which words are essential for adequate comprehension of a passage, and metacognitive self-regulation includes strategies used to store vocabulary (e.g., taking notes, mental associations, and practice) and strategies utilized to retrieve already stored vocabulary (Gu & Johnson, 1996). On the whole, metacognitive self-regulatory strategies that enhance vocabulary development (Cubukcu, 2008; Gu & Johnson, 1996; Schmitt, 1997) entail awareness of and control over one's cognition. They also involve having a plan for learning, monitoring it, and evaluating the obtained results (Pintrich et al., 2000). Overall, metacognitive and cognitive strategies of self-regulation, as defined by Pintrich (2000, 2004), could play a role in L2/EFL vocabulary development.

The Controlled and Conscious Process of L2/EFL Lexical Retrieval

There are sound reasons for the claim that L2/EFL lexical retrieval is a controlled and conscious process (e.g., Abutalebi, 2008; Gulan & Valerjev, 2010; Jiang, 2000). First, Petrides (1998, as cited in Abutalebi, 2008, p. 473) stated that the "prefrontal cortex" of the brain is divided into two areas. In other words, the dorsolateral prefrontal cortex performs "self-monitoring functions and sequential processing", while the ventrolateral prefrontal areas carry out a lower-level function that involves organizing "response sequences" actively through retrieving information consciously and explicitly "from posterior cortical association systems." Thus, "active-controlled (strategic) retrieval" which needs the involvement of "the inferior prefrontal cortex" is distinct from automatic retrieval that does not. During active retrieval, there is a conscious effort to retrieve specific information (e.g., generating a word) directed by either the participants' plans and intention or the instructions given to them. The implication of this distinction between active-controlled and automatic retrieval is that producing words in a weak L2 may be 'non-automatic', whereas L1 processing is automatic. In other words, since L2/EFL is processed in a controlled way, only for L2/EFL processing the inferior prefrontal cortex is engaged (Abutalebi, 2008, p. 473).

Second, Dekeyser (2007) maintained that retrieval of linguistic knowledge is either procedural or declarative, while both types of knowledge are the goal of vocabulary learning (Meara, 1996). Declarative vocabulary knowledge that consists in knowing word meaning (Nation, 2001) includes "remembering and retrieving words by conscious and deliberate effort in much the same way as explicit knowledge" (Henriksen, 2008, as cited in Roohani & Khalilian, 2012, p. 99). In addition, the declarative knowledge of vocabulary has a "strong and significant relationship with higher levels of metacognitive awareness" which implies "the role of consciousness in developing declarative vocabulary knowledge" (Roohani & Khalilian, 2012, p. 99).

The third evidence for conscious vocabulary retrieval comes from Gulan and Valerjev (2010, p. 53), who claim that direct retrieval uses explicit memory, but priming depends on implicit memory and happens involuntarily and unconsciously. A L2/EFL speaker, through a conscious search mechanism, must retrieve the proper lemma that matches the activated concept. In other words, retrieving the proper lemma of the word matching the concept to be named needs conscious response selection, but selecting phonemes is an automatic process (Ferreira & Pashler, 2002, as cited in Declerck & Kormos, 2012). Fourth, according to Gardiner et al. (1998, as cited in Franklin et al., 2005), in recall tasks but not necessarily in recognition tasks, we are conscious of retrieved memories. Likewise, to Ebbinghaus (1885, as cited in Franklin et al., 2005), recall means retrieval to consciousness.

Last but not least, there are three developmental stages for integrating the linguistic features (i.e., syntactic, semantic, formal, and morphological) into lexical entries for L2 learners (Jiang, 2000). In the first stage which is called formal, a lexical entry only contains an L1 translation equivalent and formal features of the word. In the second stage (i.e., L1 lemma mediation), the employment of L2 words is intermediated by the lemmas of their L1 translation. In the third or integration stage which is attained late in the process of L2 vocabulary acquisition by advanced learners, syntactic, semantic, and morphological features of the L2 lexical item are incorporated into a lexical entry. The noteworthy point here is that in the first and second developmental stages of integration of the linguistic features into L2/EFL lexical entries (e.g., the stage the low-level FL learners move through), lexical retrieval is a controlled and conscious process.

Method

Participants

The participants were 93 female Iranian EFL learners who were placed at the intermediate level based on a mock Preliminary English Test (PET; Hashemi & Thomas, 1996) given to them at the beginning of their program. In other words, they scored 70-84, i.e., B1 of Common European Framework of Reference (CERF) level. They were studying in four conversation classes with one teacher. The participants' age differed from 18 to 30 (M = 21.98, SD = 6.22).

Instruments

Motivated Strategies for Learning Questionnaire (MSLQ)

Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al., 1993) was used in this study to measure self-regulation as defined by Pintrich (2000) because it is theoretically based on this model and in line with areas for regulation in it (Pintrich, 2004). It is a seven-option Likert scale, containing 81 items in two parts: the motivation scale and the learning strategies scale. The motivation scale – in line with motivation/affect area – is composed of three sections: (a) a value section that consists of scales of extrinsic and intrinsic goal orientations, and task value, (b) an expectancy section that encompasses scales of self-efficacy for learning and performance and control of learning beliefs, and (c) an affective section that has a scale of test anxiety.

The learning strategies scale – in line with cognition area – has two sections: (a) metacognitive and cognitive strategies and (b) resource management strategies. The metacognitive and cognitive strategies section has sub-scales of metacognitive self-regulation, critical thinking, rehearsal, organization, and elaboration– the focus of this study. Resource management strategies section – in line with behavior and context areas – has sub-scales of help-seeking, study environment and time, peer learning, and effort regulation. (Pintrich, 2004). The motivation scales, the cognitive-metacognitive scales, and the resource management strategy scales are in conformity with the three components of Pintrich's (2000) definition of SRL: motivation, metacognition, and behavior (Boekaerts & Corno, 2005).

However, only the data from the metacognitive and cognitive strategies section of the learning strategy use scales (i.e., (a) above) were analyzed for the purpose of this study. According to Pintrich and De Groot (1990), the cognitive strategy use scale of MSLQ includes 14 items related to the following: rehearsal strategies (e.g., "I memorize key words to remind me of important concepts in this class"), elaboration strategies such as paraphrasing and summarizing (e.g., "When reading for this class, I try to relate the material to what I already know"), and organizational strategies (e.g., "I make simple charts, diagrams, or tables to help me organize course material". There are also five items of critical thinking (e.g., "I treat the course material as a starting point and try to develop my own ideas about it") that can be considered metacognitive because self-regulation is at the core of critical thinking (Facione, 1990), and American Philosophical Association Project defined critical thinking as the self-regulatory judgment that leads to evaluation, inference, analysis, and interpretation (Facione & Facione, 1996). These five items plus 12 items of metacognitive self-regulatory strategies of MSLQ (e.g., "When I become confused about something I'm reading for this class, I go back and try to figure it out") make the metacognitive items to be 17 ones.

Written Productive Translation Task (WPTT)

In addition, a Written Productive Translation Task (WPTT) was implemented to gauge participants' written lexical retrieval ability (see Appendix A). In other words, the same words in WPTT which were validated by Snellings et al. (2004) and almost the same procedure as theirs were employed in the present study. According to Snellings et al. (2004), WPTT is a validated measure of written L2/EFL lexical retrieval based on the oral translation tasks utilized in psycholinguistic studies. Unlike Picture Naming tasks, the WPTT is not limited to concrete verbs and nouns that can be shown by pictures and can also assess word combinations. In addition, WPTT was proved to be a good scale of the written lexical retrieval construct, employing Messick's (1989) framework. Likewise, the relationships between the WPTT and a written Picture Naming task (i.e., a test of the same construct), as well as constructs such as orthographic encoding and lexical access, were established through a multiple regression approach. All this proved WPTT to be both a valid and reliable scale of written lexical retrieval. In WPTT, learners translate from their native language into L2/EFL language in written form; a lexical retrieval process that also involves orthography (Snellings et al., 2004).

Nevertheless, the most important reason why WPTT was used as a measure in this study is that when writing in L2, low-level learners mostly use different L1-based lexical and translation strategies involving mental equation of lexical and semantic categories across languages (Cumming, 1990), almost like what happens in WPTT. In other words, they first put and phrase their intended meaning into L1 in order to find its L2 equivalent (Qi, 1998; Smith, 1994), then retrieve the L1 word that expresses their intended meaning (Qi, 1998; Smith, 1994; Wang, 2003), and finally translate that L1 term into the L2 (Zimmermann, 1989).

Data collection

First, the MSLQ (Pintrich et al., 1993) was given to the participants who had been told to read all items and circle the Likert option that fitted them. However, the metacognitive and cognitive strategies section which includes rehearsal, organization, and elaboration as well as metacognitive self-regulatory and critical thinking subscales were included in data analysis.

In order to administer WPTT to participants, the Persian equivalents of the words tested in the WPTT in Snellings et al. (2004) which were 55 items were presented to participants in a PowerPoint file (i.e., each word in one slide). The stimulus appeared and remained on the screen for 20 seconds; precisely the time when an automatic time-out message appeared in Snellings et al. (2004). The participants were asked to provide the written translation in their papers. In order to make sure about the accuracy of Persian equivalents, thus improving the validity of WPTT in Persian, before the study the first author herself – who is also a translator – had translated the English words of Snellings et al. (2004) into Persian and had asked another translator to translate them back

into English. Like in Snellings et al. (2004), all incorrect responses were considered missing values and received no mark.

Results

The Cronbach's alpha was run to calculate the reliability of metacognitive and cognitive subscales in the questionnaire. They enjoyed reliability indexes of .96 and .91, respectively, which are acceptable. Then multiple regression analysis was utilized to see if metacognitive and cognitive strategies significantly would predict participants' English written lexical retrieval ability. For a regression model, five assumptions should be examined: sample size, multicollinearity and singularity, homoscedasticity, and linearity (Pallant, 2005).

According to Tabachnick and Fidell's (2001, as cited in Pallant, 2005) formula for calculating sample size requirements, the number of independent variables was taken into account: N > 50 + 8m (m = number of independent variables), i.e., 93 > 50 + 8*5 = 90 in this study. Then the data set was examined for multicollinearity and the intercorrelations among the variables. As you can see in Table 1 below, the variance inflations factors (VIFs) of the predictors were found within an acceptable range (5.381 ~ 4.261 < 10). These VIF values imply that no variables should be deleted from the regression model for multicollinearity consideration (Pallant, 2005).

Table 1.
Coefficients for the Regression Equation (Model) and Collinearity Statistics

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collineartity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	part	Tolerance	VIF
1(constant)	7.817	5.729		1.364	.176	-3.565	19.199					
Cognitive	-.786	.205	-.723	-3.833	.000	-1.194	-.379	.367	-.375	-.312	.186	5.381
metacognitive	10.22	.160	1.027	6.404	.000	.705	1.339	.555	.560	.512	.171	4.261

a. Dependent Variable: Retrieval

Another indication of no multicollinearity is the correlation between independent variables and dependent one (i.e., r < .7). As indicated in Table 2, both of the scales (i.e., cognitive strategies and metacognitive strategies) correlate with EFL lexical retrieval ability, r (93) = .367 and .555 respectively, p < .01. Likewise, the Tolerance values for metacognitive and cognitive scales are .186 and .171 > .1 respectively, rejecting the possibility of multicollinearity.

Table 2.
Correlation between Metacognitive and Cognitive Strategies and EFL Lexical Retrieval

	Retrieval	cognitive	metacognitive
Retrieval		.367	.555
cognitive			.902

Figure 1 below depicts the normality of the regression standardized residuals in which points lie in a straight line, and Figure 2 below shows the scatterplot of the standardized residuals of dependent and independent variables, in which residuals are be approximately rectangularly distributed, with most of the scores fallen in the center. Hence, the assumptions of homoscedasticity and linearity are met (Pallant, 2005).

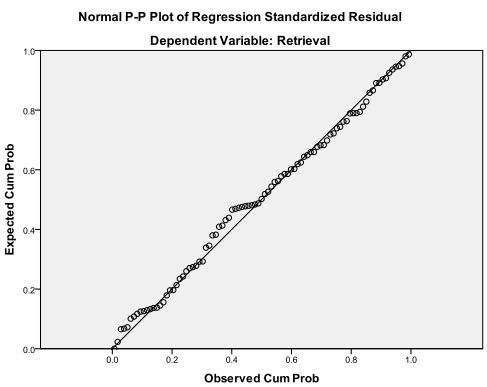

Figure 1. *The Normality of the Regression Standardized Residuals*

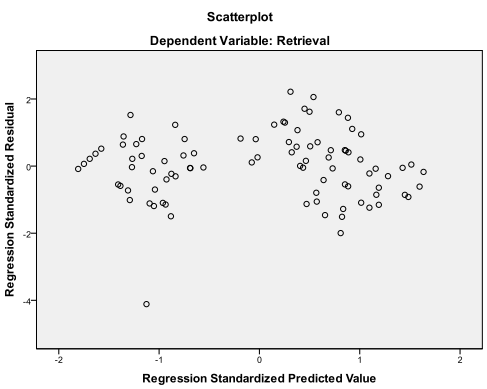

Figure 2. *Scatterplot of the Standardized Residuals*

As shown in Table 3 below, it was also found that metacognitive strategies (M = 70.88, SD = 24.76), as well as the cognitive ones (M = 61.87, SD = 19.26) predict 36% of the variance of the participants' ability to retrieve English written lexis (M = 31.62, SD = 20.96); F (2, 90) = 30.688, p < .05, adjusted $R2$ = .39 and R2 = .40. That is, metacognitive and cognitive strategies were positively related to EFL lexical retrieval, increasing by .723 and 1.207 for every point in EFL lexical retrieval, respectively. The metacognitive variable explained 27% of the variance in retrieval ability (β = 1.207, p < .05). Cognitive strategies, on the other hand, explained 9% of the variance in retrieval ability (β = .723, p < .00). The effect of metacognitive and cognitive strategies was significant, t (90) =

3.83, $p < 0.05$ and t (90) = 6.40, $p < 0.05$, respectively. Likewise, as the size of standard error for the unstandardized beta (SE B) indicates, the numbers are not so much spread out from the regression line for the significance to be less likely (Pallant, 2005).

Table 3.
Summary of the Standard Multiple Regression Analysis

	B	*SE B*	Beta	*t*	*p*
cognitive	.78*	.205	-.723*	-3.83	.00*
metacognitive	1.02*	.160	1.207*	6.40	.00*

*p<.05, Note: R^2= .40 Adjusted R^2=.39

Discussion

This research was aimed at exploring whether metacognitive and cognitive strategies of self-regulation in Pintrich's (2000) model contribute to the improvement of EFL lexical retrieval ability. The results indicated that both metacognitive and cognitive strategies of self-regulation capability in EFL learners as measured by MSLQ could significantly predict their written lexical retrieval ability as measured by WPTT. In other words, in EFL learners who do not enjoy a high level of language proficiency, EFL retrieval is not automatic but controlled, and the above strategies of self-regulation can help them retrieve EFL lexical items more successfully.

The finding that cognitive strategies of self-regulation, i.e., elaboration, rehearsal, and organizational strategies could significantly predict EFL learners' written lexical retrieval chimes with what other researchers (e.g., Dörnyei, 2005; Field, 2004; Gu & Johnson, 1996; Wolters et al., 2005) maintain about the important role of cognitive strategies in vocabulary acquisition, storage and retrieval. Besides, taking rehearsal strategies into account, this obtained result is in line with a behavioral technique used to help L1 lexical retrieval in aphasics, i.e., repeating the vocabulary item while looking at its picture, called "Look, Listen, Repeat" (Savage et al., 2013, as cited in Croot, 2018, p. 247). Likewise, as far as elaboration strategies are concerned, this finding is aligned with another method to help L1 lexical retrieval in aphasics, i.e., the semantic features or associations of the target word (Savageet al., , 2013; Sua´rez-Gonza´lez et al., 2016; as cited in Croot, 2018).

This research also provides experimental data to support the contribution of the metacognitive component of self-regulation to L2/EFL lexical ability as mentioned or found by other researchers. For example, according to Pavičić (2008), critical thinking – a subcomponent of metacognitive strategies – can predict L2/EFL vocabulary learning and retrieval. Similarly, some other researchers referred to the role of its other subcomponent, i.e., metacognitive self-regulation in L2/EFL vocabulary development (Cubukcu, 2008; Gu & Johnson, 1996; Pintrich et al., 2000; Schmitt, 1997).

Moreover, this study showed that cognitive strategies could predict 9% of written EFL lexical retrieval ability, and metacognitive ones 27%. In other words, the finding that the metacognitive component of self-regulation was a stronger predictor of the ability to retrieve EFL words than cognitive strategies can be justified in the lights of Nelson and Narens's (1990) ideas that metacognitive monitoring and control generally play a crucial part not only in the acquisition and the retention but also in the retrieval of to-be-learned information. Of course, there is also evidence for the use of cognitive strategies in lexical retrieval. Cyr and Germain (1998); for example, contended that elaboration which involves connecting new information to the concepts in the memory reorganizes knowledge in the long-term memory. Generally, as language learning strategies that include metacognitive and cognitive ones can facilitate not only the internalization and storage of the new language but also its retrieval or use (Oxford, 1990), the obtained results seem justified. Of course, as the time given for lexical retrieval and retrieval difficulty are interrelated (Abdel Rahman & Sommer, 2003; Abdel Rahman et al., 2003), one can conclude that better results might have been obtained, if the participants had been given more time.

The findings of this research can also be another representation of what Hudson (2000) suggested as the ways to retrieve an L2 word, i.e., the word's spelling, its rhyme, its initial sound, its other semantic features, its physical context of occurrence, its rough opposites, its part of speech, and its synonym. Of course, as the measure used in this study involves translation from Persian into English, the last three ways mentioned here (i.e., its rough opposites, its part of speech, and its synonym) seem to be the most likely ways employed by L2/EFL learners (i.e., like the ones in the present study) who mostly use translation in their lexical retrieval while writing (Cumming, 1990).

It is worth mentioning that there are many other psycholinguistic factors involved in lexical retrieval, and they may have affected the results of this research. For example, as this investigation has dealt with written EFL lexical retrieval, sometimes phonological and semantic aspects of lexical items are retrieved, but there is a problem with retrieving their orthographic aspect because English orthography is not transparent; without a one-to-one relationship between graphemes and phonemes (Field, 2004). More specifically, according to lexical search theory, there is an access file and an access code for orthographical, phonological, and semantic aspects of lexical items. The access code of the orthographic access file would be an aspect of the spelling of the word; for example, the first three letters (Field, 2004). Hence, in this study even if the semantic category and phonological properties of the target word were detected correctly, i.e. the access codes were compared with input stimulus, and a match was found in both semantic and phonological access files, there may have been a problem in finding an orthographic match in the orthographic access file.

Although this study supports the significant relationship between metacognitive strategies of self-regulation ability in participants and their written EFL lexical retrieval, it would be worthwhile to conduct more research to investi-

gate whether the whole construct of self-regulation, as explained by Pintrich (2000), can significantly predict retrieving L2/EFL lexical items. In addition, delving into self-regulation as defined by other researchers (e.g., Zimmerman & Moylan, 2009) and investigating its possible impact on EFL lexical retrieval seem warranted. Moreover, given the fact that some findings on the role gender plays in self-regulation have not been conclusive (Pintrich & Zusho, 2007), while others indicated that females mostly surpassed males in self-regulation (e.g., Bidjerano, 2005; Meece & Painter, 2008), further studies seem necessary to examine whether there would be any difference between men and women in their EFL written lexical retrieval ability as predicted by metacognitive and cognitive strategies and other components of self-regulation, as defined by Pintrich (2000). Likewise, considering the greater immediate gains in L1 lexical retrieval in aphasics with "Look, Listen, Repeat" treatment when incorporating written answers than when only requiring spoken answers (Croot, 2018) and the fact that the present study also involved written responses, further research can be conducted to assess oral EFL lexical retrieval as well. Last but not least, factors as the frequency, typicality, lexical ambiguity, morphological complexity, age of learning, and recency of usage (i.e., priming) of the target lexical items are said to play a role in lexical retrieval (Carroll, 2008), but these factors have not been taken into account in the present study, so these factors can be taken into consideration in the future studies.

Conclusion and Pedagogical Implications

Considering the speed with which L1/Persian words were presented, it can be concluded from the above discussion that through self-regulation, EFL learners could retrieve EFL words successfully. This can be an incentive for EFL teachers to try to teach metacognitive and cognitive strategies to their students—besides providing them with rich contextualized input (Jiang, 2000)—with the aim of increasing and ensuring their success in learning, retaining and finally retrieving EFL words.

This explicit training can be carried out through the EFL teachers' following Wolters et al.'s (2005) suggestions and their urging the students to repeat or recite new vocabulary items in a list when learning them in order to practice rehearsal strategies. Likewise, in order to implement elaboration strategies, the instructors – using the suggestions by Dörnyei (2005) and Field (2004) – can encourage learners to create internal connections between new vocabulary items and to make analogy when learning new words. Likewise, inspired by Cyr and Germain (1998), the teachers can help learners to find a word's meaning in English by drawing analogies and spotting explicit links between its L1 equivalent and their knowledge. As for teaching organizational strategies, the teachers can follow Pintrich (1999), Wolters et al. (2005), and Field's (2004) ideas and want learners to select, analyze, classify, organize, and interpret the new words.

Concerning how critical thinking can be explicitly taught to learners for better vocabulary learning and subsequent retrieval, the contentions of Linn

(2000) and Pavičić (2008) would be helpful to the teachers in order for them to train learners in keeping a learning diary of their vocabulary learning process. This leads to a critical evaluation of this process; for example, how the newly learned term is consistent with the previously known ones. Similarly, in order to self-regulate their vocabulary learning metacognitively, the students can be explicitly trained in how to select a word to be studied, to know which words are important for correct comprehension of a text, to take notes of the newly learned terms, to create mental associations of them, and to practice them; just as suggested by Gu and Johnson (1996), Pintrich, et al. (2000), and Cubukcu (2008).

Also, it should be noted that, first, bilingual lexical retrieval is a controlled search task entailing monitoring by controlled attention mechanisms because attentional resources are limited, and the brain needs to perform non-automatic retrieval (Prebianca, 2010). Second, after the critical period, L2/EFL lexical items are weak in the mental lexicon (Poulisse, 1997, as cited in Prebianca, 2010). Third, the manner in which we store lexical items is related to the ease of their retrieval (Carroll, 2008). Hence, it can be concluded that it is justifiable for L2/EFL language teachers to use elaboration strategies that can promote knowledge restructuring through; for example, the study of antonyms, synonyms, cognate words, homophones, and hyponyms and rehearsal strategies (i.e., repetition of EFL/L2 lexical items).

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Appendix A

Words tested in the Written Productive Translation Task (WPTT) (adopted from Snellings et al. (2004))

-table
-safe
-she
-animal
-broke
-young
-dry
-is looking up
-while, when
-to see
-song
-hot
-started
-saw
-sold
-to rain
-green
-were eating
-wanted to
-because, as
-before
-thanked
-to work
-something
-fell off
-a man
-then
-is proud
-told
-just in time
-a restaurant
-even now
-the owner
-a bridge
-the dog
-decided to
-caught
-but, however
-is bigger than, is larger than
-called for help, cried for help
-catch fish, catch fishes, catch a fish
-small fish, little fish, small fishes, little fishes
-very grateful, really grateful, extremely grateful
-a heavy storm, a big storm
-were happy, were glad, were pleased
-the other boys, the other guys
-so, hence, therefore
-reads, is reading
-in fact, actually
-again, yet again
-a stone, a rock
-hired, rented
-to rest, resting
-are sitting
-talks, speaks
-began