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An exploration of the interrelationships among EFL learners' English self-efficacy, metacognitive awareness, and their test performance

A structural equation modeling approach

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This study examined the interrelationships among selected cognitive characteristics of Iranian EFL learners including English self-efficacy, metacognitive awareness, and their test performance. For this purpose, a model was proposed based on empirical studies and was tested using structural equation modeling (SEM). Following this, two questionnaires were administrated to 200 Iranian EFL learners of two language institutes in Mashhad, Iran. Results of this study indicated that Iranian EFL learners perceived themselves self-efficacious. They were also metacognitively aware of their learning process. Correlation analysis results showed that metacognitive awareness statistically correlated with English self-efficacy and foreign language test performance. It was found that English self-efficacy significantly correlated with foreign language test performance as well. The proposed SEM model adequately fitted the data. Results of the SEM indicated that self-efficacy was the strongest direct predictor of learners' test performance. Metacognitive awareness directly affected learners' English self-efficacy. It also indirectly affected test performance through affecting English self-efficacy.

Keywords: Self-efficacy, Metacognitive awareness, Foreign language achievement, Structural equation modeling (SEM)

1. Introduction

Sometimes two individuals with almost the same level of knowledge take the same test, but perform differently and gain different scores. Many internal and external factors can cause these differences. In other words, to be successful

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in a test does not only depend on the ability or the competence of the learners (Pour-Mohammadi & ZainolAbidin, 2012).There are some other cognitive, personal and psychological factors which affect test performance (Hambleton, R., Swaminathan, H., & Rogers, H, 1991).One of these factors is self-efficacy.Beliefs are more important than knowledge in organizing and approaching tasks and are stronger predictors of achievement because they lead to different ways of thinking and behaving (Pajares&Schunk, 2001).Another influencing factor is metacognition. Studies demonstrated that learners who are aware of their metacognition and are metacognitively aware perform better than unaware learners (Schraw, 1994). Awareness and understanding of the process of the learning help an individual to take control of one's learning.

Despite the many studies that have examined the relationship between self-efficacy and task performance (Bouffard-Bouchard, Parent, & Larivee, 1991; Bradford & Kozlowski, 2002; Ghanizadeh & Moafian, 2011; Jackson, 2002; Pajares & Schunk, 2001), few studies have focused on the role of metacognition in second/foreign language learners' performances and language achievements(e.g., Devine, 1993; Flavell, 1979; Wenden, 1998). Also, to our best knowledge; the simultaneous relationship of self-efficacy and metacognitive awareness in foreign language achievement has not been examined so far.

It is intended to identify which of these two factors, self-efficacy, and metacognitive awareness can best predict the EFL achievement. In this study first, the contribution of each of these two factors is examined, and then the simultaneous effect of these two variables on foreign language achievement will be investigated. Findings of this study will demonstrate the role of these two personal and cognitive variables in foreign language learning.

1.1 Self-efficacy and foreign/second language achievement

Self-efficacy is an individual's sense of capabilities to successfully perform a task. A body of studies indicated that individuals are highly influenced by their beliefs. Self-efficacy has a positive relationship with academic achievement (Ghonsooly & Ghanizadeh, 2013). According to Bandura (1997) learners with higher self-efficacy work harder and persist longer in difficult situations. Thus, academic self-efficacy is student's expectation of being successful in the classroom (Bandura, 1997). If students believe that they can succeed, they are more likely to develop skills and behave in ways that promote success, which in turn strengthens their expectations of success (Pajares, 2001). As Bandura (1998) stated, self-efficacy is one's belief about one's capability to successfully accomplish a task. Recently another characteristic has been added to the Bandura's definition of self-efficacy that

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is related to the way students judge their academic competence (Ghonsooly, Elahi, & Golparvar, 2012).

There are four sources of self-efficacy proposed by Bandura (1997): 1. mastery experiences; 2. vicarious experiences; 3. social persuasion; and 4. physical and emotional states (Carr, 2004). These sources can develop individual's belief. Mastery experience is the most significant effect on self-efficacy beliefs (Ghonsooly & Ghanizadeh, 2013). In this source of self-efficacy beliefs, goals are achieved through perseverance and overcoming difficulties and obstacles. Observing the success of others through sustained effort can also develop self-efficacy. If people are persuaded that they can succeed, their self-efficacy may be enhanced. Finally, when people are physically fit and in a positive mood their self-efficacy are increased (Carr, 2004).

Rahemi (2007) studied humanities students' English self-efficacy beliefs and its relationship with their EFL achievement. She found that student majoring in humanities had a very weak English self-efficacy and had negative beliefs about their own ability as foreign language learners. Students' achievement revealed a positive correlation with their self-efficacy. The sources of this low self-efficacy were detected through qualitative data. The relationship between EFL teachers' self-efficacy belief and their self-regulation was investigated by Ghonsooly and Ghanizadeh (2013). A significant relationship was found between teachers' sense of self-efficacy and their self-regulation. Goal-setting and mastery goal-orientation, two components of self-regulation had the highest correlation with the teachers' self-efficacy beliefs. Self-assessment indicated also to have a close relationship with self-efficacy. In a study carried out by Coronado-Aliegro (2007), students' sense of self-efficacy of learning a foreign language with self-assessment ratings regarding an awareness of study habits and the importance of classroom learning topics were investigated. The results revealed a positive relationship between participants' self-assessment and their global (not task-specific) self-efficacy. It was demonstrated that high self-efficacy improves performance in executing a wide range of task. In contrast, individuals with low self-efficacy beliefs tend to avoid tasks that they think or believe they do not have the sufficient capabilities to accomplish (Iskandar & Sanusi, 2011). A study carried out to investigate the relationship between university students' self-efficacy beliefs in general English and their achievement indicated that there is a significantly positive relationship between the university students' self-efficacy General English (GE) course (Ghonsooly et al., 2012). Three groups of students studying humanities, sciences, and engineering participated in this research. The result showed a significant difference between these groups in the term of self-efficacy. There were also significant differences in GE course achievement among the three groups of students and their achievement. The findings of this study proposed teachers to encourage students to find ways to improve

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their self-efficacy that can be helpful for them to achieve higher scores in general English course (Ghonsooly et al., 2012).

1.2 Metacognition and foreign/second language achievement

Metacognition was first introduced by John Flavell in 1978. He defined this term as thought about one's own thoughts and cognitions. Metacognition is the ability to control, understand and manipulate one's own cognitive process in order to enhance and maximize learning or as Schraw (1994) put it in words: it is "the ability to reflect upon, understand, and control one's learning" (Schraw& Dennison, 1994, p. 460). Considering the fast speed of change and innovation in knowledge, being socially and mentally active learners, being learners who are aware of their own cognition and develop critical thinking and metacognitive awareness seems necessary (Cihanoglu, 2012). Recent studies indicated that learners who are aware of their metacognition or are metacognitively aware, perform better than unaware learners. This happens because metacognitive awareness allows learners to plan, sequence, and regulate their own learning which results in improving their performance (Schraw, 1994).

Two categories were distinguished for metacognition including knowledge of cognition and regulation of cognition (Flavell, 1979). Knowledge of cognition measures an awareness of one's strengths, weaknesses, knowledge about strategies, and why and when to use those strategies. Regulation of cognition measures knowledge about planning, implementing, monitoring, and evaluating strategy use. Flavell (1979) classified knowledge of cognition into three subcategories: person, task, and strategy knowledge. These three variables affect the outcome of cognitive enterprises (Zhang & Wu, 2009). Person refers to general knowledge which an individual has about human being's cognitive capabilities. Task is the knowledge about the nature of the task. Finally, strategy indicates the knowledge about strategies that may be useful for various tasks and different situations.

Regulation of cognition consists of a set of sub-processes that regulate and facilitate the control aspect of learning (Schraw& Dennison, 1994). Three skills of this component are planning, monitoring, and evaluation (Schraw, 1998). Planning refers to goal setting and choosing the appropriate strategies before involving in learning. Monitoring is the consideration of learning, task performance and the use of strategy while engaging in an activity. Evaluation is the assessment of learning outcomes and strategies to examine whether the goals have been achieved i.e., the evaluation of achievement (Schraw, 1998).

Metacognitive awareness plays an important role in cognitive activities related to language use and acquisition (e.g., Devine, 1993; Flavell, 1979; Wenden, 1998). As Cao and Nietfeld (2007) reported in their study, having strong metacognitive

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awareness is necessary to successful learning. A good learner is "one who has ample metacognitive knowledge about the self as learner, about the nature of the task, and about appropriate strategies for achieving cognitive goals" (Devine, 1993, p. 109).Successful learners need to be aware of their knowledge. In other words, he believed that reflection, feedback, and an awareness of knowledge are critical for being successful learners.

There are differences among learners in the extent to which they can manage to regulate their task through cognition and consequently they differ in the extent to which they gain success in a task at hand (Siam &Soozandehfar, 2011). Many studies intended to investigate the role of metacognitive knowledge in ESL/ EFL (English as a second/ foreign language) learners' performance. The findings indicated the critical function of learners' beliefs and knowledge about learning in language activities. Findings further demonstrated a relationship among metacognitive strategies, self-efficacy, and also academic achievement. Cao and Nietfeld (2007) pointed out that thinking about choosing strategies and learners' choices of particular learning strategies are behaviors constitute plans of actions in order to achieve a certain goal. He found that the employment of learning strategies is related to learners' perceived and actual ability, coordination of metacognition and prior knowledge, and measures of academic achievement (Cao &Nietfeld, 2007, p. 32). Learners with the high awareness of the feedback they receive from taking a test are able to adjust their self-efficacy based on this feedback. Students with low or no metacognitive awareness do not change their self-efficacy (Isaacson & Fujita, 2006).

1.3 Present study

Following the previous empirical studies and abovementioned relationships between self-efficacy, metacognition, and foreign language learning this study first investigates the predictive power of self-efficacy and metacognitive awareness in foreign language achievement. Then, the relationship between these two variables is examined. Some studies have examined the relationship between self-efficacy and language performance (Bouffard-Bouchard, Parent, &Larivee, 1991; Bradford & Kozlowski, 2002; Ghanizadeh&Moafian, 2011; Jackson, 2002; Pajares&Schunk, 2001), and some other studies investigated the role of metacognitive awareness in cognitive activities related to language use and acquisition (Devine, 1993; Flavell, 1979; Wenden, 1998). However, no study has examined the simultaneous relationship of these two factors as predictors of language learning and achievement.Also, Results will have many implications for language teachers, learners, and researchers.

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2. Method

2.1 Participants

The individuals participating in this study were 200 EFL learners studying English in two language institutes located in North East of Iran. Their first language was Persian and they included both male and female learners. The number of the female participants amounted to 153 (76.5%), whereas that of the male participants corresponded to 47 (23.5%). All of them were adult intermediate learners aged 20–30.In the time of data collection, they had successfully passed the achievement test of the last semester and were able to attend language courseof the present semester. Furthermore, all the participants had successfully passed a standardized placement test designed and carried out by institutes and also a proficiency interview to have the permission to go on at this level or to move from elementary to intermediate. As a result, they were expected to be experienced in taking language tests. In addition, it is expected that their language learning self-efficacy beliefs and metacognitive awareness have been developed through learning English courses

2.2 Materials

2.2.1 *Self-efficacy*

English self-efficacy of testees was measured by the use of a questionnaire adopted from Rahemi (2007). The questionnaire consisted of ten five-point Likert-type items investigating self-efficacy beliefs of participants. Responses for each item ranged from 'strongly agree' to 'strongly disagree'. The numerical values were assigned to participants' responses for each questionnaire items. Therefore, if a learner marked 'strongly agree' he would get 5 for that item. For 'agree', a numerical value of 4, for 'neither agree nor disagree', 3, for 'disagree', 2, and for 'strongly disagree', 1 were assigned. The Cronbach's alpha reliability coefficient reported by Rahemi for self-efficacy questionnaire was 0.82.In this study, the total Cronbach's α was 0.75 which was acceptable (Dörnyei, 2007).

2.2.2 *Metacognition*

The metacognitive awareness inventory used in this study was adopted from Schraw and Dennison (1994). This questionnaire included 52 statements investigating two categories of metacognition; knowledge of cognition and regulation of cognition with their subcomponents. Items are mixed and not divided into these categories (Schraw, 1998). All items are in a five-point Likert-scale, ranging from 'strongly agree', 5, to strongly disagree 1. This inventory has shown a good reliability and validity for assessing individuals' metacognition (Coutinho, 2007). In

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this study, the scale showed a satisfactory reliability coefficient of 0.88.Schraw and Dennison (1994) also reported a Cronbach's α of .95 for the entire scale in their study.

2.2.3 *Foreign language achievement*

The achievement of learners was investigated through their performance on final exam of that semester. The test consisted of four parts. Grammar and vocabulary parts examined learners' knowledge of vocabulary and grammar points which they acquired during the term. It also tested learners' listening ability and their ability in dealing with general reading passages. Scores were used as a criterion for learners' achievement. In an instructional achievement test, testees must perform accurately, often under time constraints, and are hold accountable for their responses (Cohen, 1998, p. 92). This may discourage risk-taking and hold the testees in an anxious situation.

Ability is not the mere factor that affects learners' performance. There are some other cognitive, personal and psychological factors which affect learners' test performance (Hambleton et al., 1991, as cited in Pour-Mohammadi&ZainolAbidin, 2011).

Self-efficacy and metacognitive awareness are of those psychological factors which play a role in the way learners take the test and therefore, affect their test performance. Self-efficacy refers to the belief about the capability of performing a task and determines the expectations about the outcome. Thus, self-efficacy beliefs may have an effect on the performance and achievement of students.

Awareness of what happens in one's mind and one's thinking process may help individuals to have more control over their cognitive process and to become more effective. This control of cognitive and metacognitive process would allow learners to find out which strategies are more effective in particular test circumstances.

2.3 Procedure

Participants voluntarily took part in the present study and before starting the project, the necessary steps were taken to have the permission of collecting data in related language institutes. After identifying the sample of participants, they were asked to complete self-efficacy scale. Simultaneously, they were given metacognitive awareness inventory. It took about 15 minutes to complete both questionnaires in one session.

Statistical Package for Social Sciences (SPSS 19) was used for inputting data and computing descriptive statistics, reliability analysis of questionnaires, and correlational analyses. LInear Structural RELations (LISREL 8.50) software was used to perform Structural Equation Modeling (SEM).

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Descriptive statistics were used to summarize the characteristics of the data set including mean, minimum, maximum, standard deviation, skewness, and kurtosis values. Descriptive statistics also provide essential information regarding the normality of the distribution.

3. Results

Table 1 presents descriptive statistics of metacognitive awareness, self-efficacy, andforeign language achievement scores.

Table 1. Descriptive statistics for test performance, self-efficacy, and metacognitive awareness

Subscales	Min	Max	M	SD	Skewness	Kurtosis
Test performance	50.00	99.00	83.97	9.28	−.78	.41
Total SE	27.00	50.00	38.93	4.82	.14	−.40
Total MA	128.00	249.00	196.88	22.06	−.06	.06

As shown in this table, the highest possible score for metacognitive awareness inventory was 260. The learners' metacognitive awareness ranged from 128 to 249. The mean score obtained for total metacognitive awareness was 196.88 which was more than 75% of the full score for this scale (260). This implies EFL learners' tendency to be metacognitively aware of their learning and think about their cognition.

Considering 10 items on a five point scale, full score for self-efficacy questionnaire was 50. The learners' total self-efficacy ranged from 27 to 50 with mean score of 38.93which is 77.8% of the full score for this scale (50). It can be inferred that in general, the test-takers found themselves self-efficacious.

The scores were normally distributed within the range of ±2.0. The scores were ranged from 50 to 99 and the mean score was 83.97.

The hypothesized model was assessed using LISREL 8.50 statistical package. Assessment of the model demonstrated a good fit to the data (Table 2).

Table 2. Goodness-of-fit indices for the structural model

	χ^2	*df*	χ^2/df	GFI	CFI	NFI	TLI	RMSEA
Acceptable fit			<3	≥.90	≥.90	≥.90	≥.90	≤.08
Structural model	282.39	113	2.49	.86	.97	.95	.96	.08

A number of fit indices were examined to evaluate the model fit: the χ^2/df magnitude, which should be less than three, the Normed Fit Index (NFI), and the

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Comparative Fit Index (CFI) with a cut value greater than 0.90 or 0.95, and a Root-Mean-Square Error of Approximation (RMSEA) of around 0.06 (Schreiber, Amaury, Stage, Barlow, & King, 2006). The acceptable criteria for fit indices are presented in Table 2.

As demonstrated in Figure 1, the *χ2* value (282.39), the *χ2 /df* ratio (2.49), the CFI (.97), the RMSEA (.08), and the NFI (.95) all reached the acceptable fit thresholds. The only fit indices that did not meet the acceptable fit thresholds (GFI=0.86) was slightly below those thresholds. According to Tseng, Dörnyei, and Schmitt (2006), in SEM it is normal for some indices not to conform to the majority trend. Therefore, it can be concluded that the proposed model had a good overall fit with the empirical data.

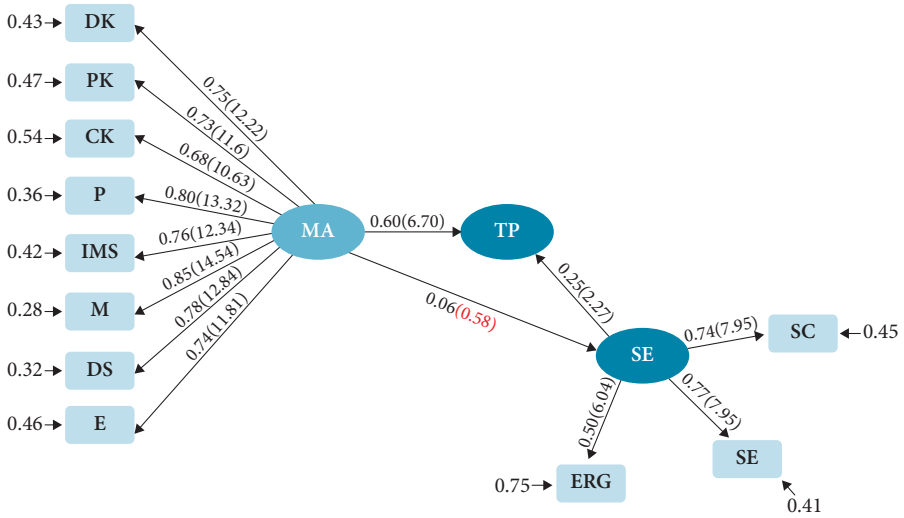

Figure 1. Final model of EFL learners' metacognitive awareness, self-efficacy, and test performance. (χ2 = 282.39, df = 113, p = .0.00, RMSEA = .08, GFI = .86, NFI = .95, CFI = .97)

Overall, the final structural model in this study provided an adequate fit to the data, supporting the proposed interrelationships among self-efficacy, metacognitive awareness, and test performance in Iranian EFL context. As indicated in Figure 1, two estimates were displayed on the paths. The first one is the standardized coefficient (*β)* which explains the predictive power of the independent variable and presents an easily grasped picture of the effect size. The closer the magnitude to 1.0, the higher the correlation and the greater the predictive power of the variable is. The second measure is the *t*-value (t); if $t > 2$ or $t < -2$, we call the result statistically significant.

The results demonstrated that metacognitive awareness is a positive and significant predictor of learners' self-efficacy (*β*= .60, *t*= 6.70). As can be seen in the

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final model, although metacognitive awareness had a positive effect on learners' test performance (MA: β= .06, t= .58), its magnitude was not strong enough to reach significant level; however, it has an indirect effect on language test performance through affecting self-efficacy. In other words, this model confirms the hypothesis that metacognitive awareness has an effect over self-efficacy which in turn influences success in L2 (second language) test performance. As the final model shows, self-efficacy is a significant direct predictor of learners' test performance (β= .25, t= 2.27).

Since LISREL is not capable of estimating the relationships between exogenous variables and the observed components of the endogenous variables, SPSS was run to investigate the relationships between the variables (two-by-two), the Pearson Product Moment Formula was run and the results are presented below.

Table 3. Correlations among learners' metacognitive awareness, english self-efficacy, and their test performance

Variable	MA	SE	TP
MA	1.00		
SE	0.499**	1.00	
TP	0.199**	0.237**	1.00

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

Table 3 shows that the test-takers' scores on test-taking strategy scales correlate with their scores in the metacognitive awareness inventory. As can be seen in the table above, there is a good and reasonable correlation between learners' metacognitive language awareness scores and their self-efficacy scores. The positive relationship between these two variables suggests that being metacognitively aware of one's learning leads to higher self-efficacy and the other way round. The correlation coefficient of .237 shows a positive relationship between test-takers' perception of their ability to carry out an English task and their performance on the task. The correlation coefficient offers a satisfactory degree of correlation between these two variables, showing a positive relationship between learners' metacognitive awareness and their test performance. It can be inferred that those who saw themselves metacognitively aware of their learning and thought about the mental processes frequently had a better test performance.

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4. Discussion

The current study investigated the relationships between selected cognitive characteristics of learners and their foreign language ability, in particular with regard to the influence that test takers' cognitive ability might have on their foreign language test performance. It investigated two variables (metacognitive awareness and self-efficacy) among Iranian EFL learners. The relationships between these variables along with learners' test performance were also investigated. A model was hypothesized to examine the interrelationships of EFL learners' metacognitive awareness level, EFL learners' English learning self-efficacy, and EFL learners' test performance and test achievement. For exploring the proposed model, SEM was used.

The model proposed in this study was the first model investigating the interrelationships among above mentioned variables in an Iranian context. Therefore, the results of this study might be helpful for EFL context. The findings emphasized the importance of learners' cognitive characteristics specially self-efficacy and metacognitive awareness in learners' test performance. It seems that an attempt to enhance learners' self-efficacy and metacognitive awareness can improve learners' test performance.

As it was discussed in the previous section, metacognitive awareness was a direct positive predictor of self-efficacy. The final model (Figure 1) showed that self-efficacy is a positive direct predictor of test performance. It means that those EFL learners with high self-efficacy perform better on tests. A number of empirical studies have linked self-efficacy to academic performance (e.g., Ghonsooly and Ghanizadeh, 2013; Rahemi, 2007; Bouffard-Bouchard, Parent, &Larivee, 1991). This finding is in line with what Bandura (1997) expressed. He stated that self-efficacy is a direct cause of performance in academic settings. In another study carried out by Coronado-Aliegro (2007), it was found that high self-efficacy improves performance in executing a wide range of tasks. A study carried out by Rahemi (2007), students' achievement revealed a positive correlation with their self-efficacy. Her finding was in line with what Iskandar and Sanusi (2011) noted in their study. They found that individuals with low self-efficacy beliefs tend to avoid tasks that they think or believe they do not have the capabilities to accomplish those specific tasks. A significantly positive relationship between the university students' self-efficacy GE course was also found by Ghonsooly et al. (2012).

Regarding the role of metacognitive awareness in EFL learners' performance, the final model showed that metacognitive awareness was not a direct predictor of EFL learners' test performance. However, it indirectly affected test performance through influencing self-efficacy. In other words, this model confirms the hypothesis that metacognitive awareness had an effect on self-efficacy which in turn

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influences success in L2 test performance. It implies that those learners who had a higher level of metacognitive awareness found themselves more self-efficacious and were better able to focus their attention. This, in turn, leads to better performance in an L2 test situation.

There are some implications for foreign language learners, researchers, and teachers regarding the findings of this study. This study showed that metacognition is a strong predictor of EFL learners and an indirect predictor of foreign language achievement.As it was also mentioned by Pishghadam and Khajavi (2013), this finding suggests that foreign language teachers can compensate for intellectual shortcomings of the learners by turning to metacognition. Schraw (1998) proposed four general ways to increase metacognition in classroom settings. These include promoting general awareness of the importance of metacognition, improving knowledge of cognition, improving regulation of cognition, and fostering environments that promote metacognitive awareness. Extended practice and reflection play crucial roles in the construction of metacognitive knowledge and regulatory skills (Schraw, 1998). This is especially true when students are given regular opportunities to reflect on one's successes and failures (Kuhn, Schauble, & Garcia-Mila, 1992; Siegler& Jenkins, 1989, as cited in Schraw, 1998). Metacognitive training would be helpful for learners. It includes "heightening awareness of the feeling involved in different aspects of language learning, and of individuals' own personalities and strengths and how these could best be employed in language learning" (Williams & Burden, 1997, p. 156).

Observing other learners' performing a task which is attempting to learn or vividly visualize themselves successful in performing a task is a source of self-efficacy. Learners' self-efficacy can also be enhanced by social persuasion (verbal persuasion). Generally, positive verbal statements are provided to increase self-efficacy. They must be believable and be delivered by someone that the receiver believes to be trustworthy. Teachers might be the best characters who can persuade learners that they have the necessary capability to perform language task as they are usually considered the most trustworthy people by learners, especially in the classroom environment. Working on other sources of self-efficacy can also help to raise the belief of having the ability to accomplish given English tasks.

Considering the limitation of this study, the participants were all at the intermediate level. It might be useful to conduct a study that includes different proficiency levels to check whether this factor plays a role in alteration of attributions considered as variables in this study. In addition, proposing and testing different models with different hypothesized paths between variables especially in foreign language context will help researchers to investigate the relationship between variables more deeply and have a better understanding of how they work.

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In spite of these limitations the results of the present study can help learners not only perform better under test situations, but also enhance their abilities and skills that can be helpful in other areas of learning especially those which need more profound attention. Being aware of factors which play a role in learning process seems to open a new window for learners to look through and have more control over their learning and thinking processes. This new trend would help learners become more active and more conscious during their learning processes.

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