The Role of Language Learning Strategies in Predicting Meta-cognitive and Motivational Self-regulated Learning[1]

Abbas Ali Zarei*[2]
Mahboubeh Guilanian[3]

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Abstract

To investigate the predictive power of language learning strategy types on meta-cognitive and motivational self-regulated learning components (task value, control of learning beliefs, and test anxiety), 149 male and female BA level students, majoring in English translation and English language teaching were selected to participate in this study. To collect data, a Michigan Test of English Language Proficiency (MTELP) was given to homogenize the students. In addition, the participants were also asked to answer the Strategy Inventory for Language Learning (SILL) and Motivated Strategies for Learning Questionnaire (MSLQ). Four separate stepwise multiple regression procedures were used to analyze the obtained data. The results showed that cognitive, meta-cognitive and compensation strategies had predictive power for meta-cognitive self-regulated

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[2] Associate professor, English department, Imam Khomeini International University, (corresponding author); a.zarei@hum.ikiu.ac.ir
[3] MA graduate, Islamic Azad University, Takestan Branch; m.gilanian@yahoo.com

learning. Moreover, meta-cognitive, memory, and affective strategies were predictors of task value. The findings also showed significant relationships between meta-cognitive strategies and control of learning beliefs. In addition, the only negative predictor of test anxiety were communication strategies.

Keywords: Meta-cognitive self-regulated learning, Motivational self-regulated learning, Language Learning Strategies (LLS).

1. Introduction

Over the decades, various aspects of learning have been considered by many researchers such as Pintrich (2000a); Pintrich (2003); Pintrich, McKeachie, and Lin (1987); Zarei and Azin (2013a, 2013b); Zarei and Hatami (2012); and Zarei and Gilanian (2014a, 2014b). Educational researchers define self-regulated learning as the students' capability to comprehend and direct the environment in the process of learning (Schraw, Crippen, & Hartley, 2006). Zimmerman (2000) believes that cognition, meta-cognition, and motivation are three necessary components of self-regulation. According to Pintrich, Smith, Garcia, and Mckeachie (1993), self-regulated learning consists of motivational self-regulation and learning strategies. They categorize motivational self-regulation into intrinsic and extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety. They also classify learning strategies into three general types: cognitive strategies, meta-cognitive strategies, and resource management. Additionally, they claim that rehearsal, elaboration, organization, and critical thinking are subcategories of cognitive self-regulation. Moreover, they subcategorize resource management into time/study environmental management, effort regulation, peer learning, and help seeking.

Language learning strategies have also been investigated by many educational psychologists in the last decades. Language learning strategies facilitate language learning and help learners to learn both simple and complex materials, and self-direct the process of learning (Dansereau, 1985; Green & Oxford, 1995; O'Malley & Chamot, 1990; Oxford, 1990; Zarei & Shahidi Pour, 2013a).

Although many studies have been done in the field of educational psychology, few studies have investigated the predictive power of language learning strategies on meta-cognitive self- regulated learning, task value, control of learning beliefs, and test anxiety as components of self-regulated learning. Thus, the present study aims to partially fill this gap by addressing the following research questions:

1. Which of the language learning strategies are better predictors of meta-cognitive self-regulated learning?
2. Which of the language learning strategies are better predictors of task value?

3. Which of the language learning strategies are better predictors of control of learning beliefs?
4. Which of the language learning strategies are better predictors of test anxiety?

2. Literature review

2.1. Meta-cognitive self-regulated learning

Babbs and Moe (1983) refer to meta-cognitive strategies as "awareness of thinking" or "thinking about thinking", which show how individuals think about thinking and analyze their own thinking habits. According to Brown (1987) and Schraw and Moshman (1995), knowledge and regulation of cognition are two components of meta-cognition. Corno (1986), Nolen (1988), Pintrich (2000b), Pintrich and De Groot (1990), Schraw and Moshman (1995), and Wenden (1987) claim that meta-cognitive self-regulated learning consists of planning, monitoring, controlling, revising, regulating, and evaluating cognitive strategies. Planning refers to activities including goal setting, skimming a text, activating relevant prior knowledge, generating questions, and task analysis, which help students plan their use of cognitive strategies and make the information processing much easier (McKeachie, Pintrich, Lin, & Smith, 1986; Pintrich, 1999; Schraw et al., 2006). Monitoring activities constitute an essential aspect of self-regulated learning and consist of the self-testing skills used to direct the monitoring process and to help being self-regulating during learning tasks as well as to connect materials with background knowledge (Pintrich, 1999; Pintrich, Smith, Garcia & McKeachie, 1991; Pressley & Ghatala, 1990). Regulation/evaluation strategies, which are closely linked to the monitoring component, are regulatory processes of individual's learning, help learners to adjust the cognitive activities, and consequently to achieve the learning goals (McKeachie et al., 1986; Pintrich, 1999; Pintrich et al., 1991; Schraw et al., 2006)

2.2. Motivational self-regulated learning

According to Pintrich et al. (1993), one aspect of self regulated learning is motivation. Baumeister and Vohs (2007); Nicholls (1984); and Schraw et al. (2006) believe that motivation is students' internal power and beliefs in their talent leading to success in academic tasks. According to Bandura (1977), "self-efficacy" and "epistemological beliefs" are two important components of motivation. Pajares (1996) claims that self-efficacy helps students to carry out challenging tasks; so, it has a major role in self-regulated learning. Epistemological beliefs refer to the essence of the knowledge including (a) quick learning, (b) innate ability, (c) simple knowledge, and (d) certain knowledge (Schommer, 1994; Schraw et al., 2006). From another point of view, Pintrich (1989) classifies motivational scales based on three general motivational models including: expectancy, value, and affect components. According to Duncan and McKeachie

(2005), expectancy components focus on learners' beliefs enabling them to fulfill a task. Value components, which are based on achievement goal theory and expectancy value theory, refer to motivations leading students to engage in academic tasks. Finally, affect components refer to the responses to the test anxiety scale. In MSLQ, Pintrich et al. (1993) refer to "task value", "control of learning beliefs", and "test anxiety" as subscales of motivational scales.

Task value has to do with individuals' perception of the interest, usefulness, significance, and cost of a task (Eccles, Adler, & Meece, 1984; Eccles & Wigfield, 2002; Schunk, 1991; Wigfield, 1994; Wigfield & Eccles, 2000). McWhaw and Abrami (2001), Pintrich (1999), Pintrich and De Groot (1990), and Pokay and Blumenfeld (1990) claim that students who attach great importance to the value of the task in comparison with those who attach a low value to the task will use more cognitive and meta-cognitive strategies. Battle and Wigfield (2003) and Eccles (1983, 1987) suggest four constructs for task value including intrinsic value, attainment value, utility value, and perceived cost. Intrinsic value refers to interest in performing the task. Attainment value refers to the significance of understanding and completing the task. The third construct measures the usefulness of doing the task for the individuals' future goals. Perceived cost refers to cognitive and emotional attempt which is necessary to complete the task.

Control of learning beliefs is related to students' beliefs in the process of learning. Rotter's (1966) locus of control theory, which is similar to expectancy-based theory, is concerned with individuals' learning ability. Thus, McKeachie et al. (1986) believe that personal control of learning beliefs can play a major role in learning activities and achievement. In a boarder theoretical framework, Connell and Wellborn (1991) suggest three basic psychological needs of competence, autonomy, and relatedness for control of learning beliefs.

Pintrich et al. (1991) and Zeidner (1998) refer to test anxiety as a personality trait, an unpleasant feeling, an emotional state, and a clinical state which may be represented during doing a test or other cognitive measures. Since text anxious students at all levels of education cannot easily use self-regulated learning strategies, they perform poorly and complete a test with difficulty despite having good study skills (Bandalos, Finney, & Geske, 2003; Everson, Millsap, & Rodriguez, 1991; Pajares & Miller, 1994; McKeachie, Lin, & Middleton, 2004; Van Zile-Tamsen, & Livingston, 1999). Morris, Davis, and Hutchings (1981) believe that "emotionality" and "worry" or "cognitive test anxiety" are the two components of test anxiety. Many researchers (e.g. Cassady & Johnson, 2002; Hembree, 1988; Liebert & Morris, 1967; Morris et al., 1981; Sarason, 1984; Spielberger & Vagg, 1995; Unruh & Lowe, 2010) have studied various dimensions of test anxiety. According to Sharma and Sud (1990) and Spielberger and Vagg (1995), the emotional dimension of test anxiety refers to self-perceived reactions which have effects on physical arousal. Deffenbacher (1980) and Morris et al. (1981) state that the physical reaction may be revealed in different forms such as increased galvanic skin response and heart beat, dizziness, nausea, and feelings of panic. Lufi, Okasha, and Cohen (2004) claim that individuals with a

high level of emotionality have fear of test. "Worry" is a dimension of test anxiety which refers to cognitive test anxiety and has effects on a test. In other words, cognitive test anxiety has to do with the effects of failure which is per se associated with decrements of performance (Hong, 1998; Morris & Liebert, 1969; Sharma & Sud, 1990; Van der Ploeg, 1984). Therefore, students with high levels of cognitive test anxiety or worry tend to compare their performance with peers. They may also be concerned about the effects of failure and have low levels of confidence in their performance. These, in turn, may cause learners to feel unready for tests and to lose self-worth (Deffenbacher, 1980; Hembree, 1988).

A number of researchers have studied various components of self-regulated learning. Neuville, Frenay, and Bourgeois (2007) investigated the relationships between motivational self-regulated learning components (task value, self-efficacy, and goal orientations) and achievement behaviors of 184 Belgian psychology students. The required data were collected through a self-reported questionnaire and analyzed using a stepwise multiple regression analysis procedure along with two separate multivariate analysis of variance (MANOVA) procedures. The findings showed that motivational variables influenced self-regulated learning strategies, and self-regulated strategies influenced performance. However, there were no significant differences among the effects of motivational variables on performance. It was also found that value and learning-approach goal orientation influenced choice. Moreover, the results indicated that task value influenced learning strategies and behavioral outcomes.

Zarei (2014) studied the effect of reading anxiety and motivation on EFL learners' choice of reading strategies. To collect data, foreign language reading anxiety, reading strategies and motivation questionnaires were administered to 120 female pre-university EFL students. The results revealed a significant relationship between reading anxiety and motivation. In addition, the findings showed significant differences among the effects of motivation levels on the choice of reading strategies.

In another study, Zarei and Gilanian (2014a) examined the relationship between cognitive self-regulated learning components and language learning strategies. To collect data, the Strategy Inventory for Language Learning and Motivated Strategies for Learning Questionnaire were used. The results of the stepwise multiple regression analysis procedures showed that memory strategies were the best predictor of rehearsal self-regulated learning. Additionally, meta-cognitive, affective, and memory strategies were predictors of elaboration self-regulated learning. Moreover, the relationships between meta-cognitive and cognitive strategies and organization self-regulated learning were significant.

2.3. Language Learning Strategies

Learning strategies refer to individuals' behavior and thought which help them to encode learning process (Weinstein & Mayer, 1986). In the context of lan-

guage learning, strategies can help learners to enhance their performance in order to learn and use a language. The role of language learning strategies in the process of language learning is undeniable (Bremner, 1999; Naiman, Frőhlich, Stern, & Todesco, 1978; Oxford, 1989, 1990; Zarei & Elekaei, 2012). O'Malley and Chamot (1990) refer to language learning strategies as the special thoughts and behaviors in the processes of understanding, learning, and retaining the new information. Since Oxford (1990) states that language learning strategies facilitate the process of learning, it can be concluded that good language learning strategy use leads to self-regulated learning.

Several researchers have classified language learning strategies. Oxford (1990) and Rubin (1981) classify language learning strategies into two major categories: direct and indirect. The former includes strategies which are directly related to language learning and those which involve mental processing of the language while the latter encompasses those which are indirectly related to language learning.

Direct strategies include the following subcategories:

1. Memory strategies: These strategies, which are also called mnemonics, help learners to store and retrieve information for communication.
2. Cognitive strategies: These strategies enable learners to understand and produce new language through mental processing such as reasoning and analyzing.
3. Compensation strategies: In order to compensate for learners' lack of knowledge and skills, these strategies assist learners in guessing the meaning of unknown words or applying gestures in speaking and writing.

Indirect strategies are classified into three subcategories as follows:

1) Meta-cognitive strategies: These strategies help learners to control the process of doing their exercise through planning, coordinating, and evaluating their own learning.
2) Affective strategies: In order to control emotion, motivation, and attitude during language learning, these strategies enable learners to reduce anxiety, which normally stems from self-doubt.
3) Social strategies: These strategies are related to activities such as asking questions and cooperating with others which help learners to improve learning.

In addition to the afore-mentioned strategies, Oxford and Crookall's (1989) taxonomy consists of one more subcategory - communication strategies. Communication strategies refer to the compensation strategies which are applied during communication.

A number of studies have been done in the field of language learning strategies. Hong-Nam and Leavell (2006) investigated language learning strategy use

of EFL students in an intensive English learning context. To this end, the Strategy Inventory for Language Learning was administered to 55 ESL students from different nationalities, and cultural and linguistic backgrounds. The findings showed that intermediate level students use language learning strategies more than beginning and advanced level students. Moreover, the findings suggested more frequent use of affective and social strategies among female students compared with male students. It also turned out that students used meta-cognitive strategies the most frequently while they preferred to use affective and memory strategies the least frequently.

Yilmaz (2010) examined the relationship between language learning strategies, gender, proficiency, and self-efficacy beliefs. The results showed significant differences in the affective strategies use at various proficiency levels. Learners at a high level of proficiency used affective strategies more frequently, which helped them to decrease their anxiety. Moreover, the findings revealed that female students used affective strategies more frequently than male students did.

Zarei and Shahidi Pour (2013a) investigated the relationships between types of language learning strategies and L2 idioms comprehension. 112 male and female BA and MA level students majoring in English participated in their study. The results of multiple regression analysis showed the predictive power of cognitive and affective learning strategies on L2 idioms comprehension.

In another study, Zarei and Gilanian (2014b) investigated types of language learning strategies as the predictors of goal orientation. The participants were 145 BA level students majoring in English who were required to answer the Strategy Inventory for Language Learning and Motivated Strategies for Learning Questionnaire. In order to analyze the collected data, stepwise multiple regression analyses were used. The findings revealed significant relationships between meta-cognitive, compensation, and cognitive strategies on the one hand; and intrinsic goal orientation on the other. The relationship between affective strategies and extrinsic goal orientation was also significant. In addition, affective, meta-cognitive, and compensation strategies had a predictive power for task goal orientation. Furthermore, the results indicated that social and compensation strategies were predictors of ability approach goal orientation. Moreover, social strategies had a predictor power on the ability avoid goal orientation.

To sum up, even though many studies have been conducted in the field of self-regulated learning and language learning strategies, there appears to be a gap in our understanding of the role of language learning strategies in various components of self-regulated learning such as meta-cognitive self-regulated learning and motivational self regulation. Thus, the purpose of this study is to partially fill this gap by investigating the predictive power of language learning strategies on meta-cognitive self-regulated learning and some of the subcategories of motivational self-regulation including task value, control of learning beliefs, and test anxiety.

3. Method

3.1. Participants

The participants of the present study were initially 240 male and female BA level students at Imam Khomeini International University in Qazvin and Islamic Azad University in Takestan majoring in English translation and English teaching. After homogenization and the administration of the questionnaires, only 149 homogeneous participants who had answered all of the questionnaires were selected as the participants of the study.

3.2. Instruments

The data collection instruments used in this study included the followings:

1) To homogenize the participants, The Michigan Test of English Language Proficiency (MTELP) was administered. The test consisted of 100 grammar, vocabulary, and reading comprehension items in multiple-choice format.

2) The second instrument used to elicit information about the participants' language learning strategies was a Strategy Inventory for Language Learning with 60 items about strategies on a five-point Likert scale from "Never" to "Always" developed by Oxford (1990).

3) The last instrument used to assess the participants' meta-cognitive and motivational self-regulation was "Motivated Strategies for Learning Questionnaire-MSLQ" developed by Pintrich et al. (1993). It consisted of motivational and learning strategies scales and it had a total number of 81 items. However, only 27 items measuring meta-cognitive self-regulated learning, task value, control of learning beliefs, and test anxiety were used for the purpose of this study.

3.3. Procedure

To achieve the purpose of the study, the following procedure was gone through. First, 240 participants with the afore-mentioned characteristics were selected. Second, the Michigan language proficiency test was administered to the students. The duration of this test was 60 minutes. After homogenization, 149 students who scored between one standard deviation above and below the mean remained as the participants.

Next, the Strategy Inventory for Language Learning (SILL) was given to the participants. The participants were required to answer the questionnaire by choosing from among the five-point Likert scale.

Then, the "Motivated Strategies for Learning Questionnaire-MSLQ" developed by Pintrich et al. (1993) was administered to determine the participants'

use of meta-cognitive self-regulated learning and some components of motivational self-regulated learning (e.g. task value, control of learning beliefs, and test anxiety). It consisted of 81 items of which only 27 items were concerned with meta-cognitive and motivational self-regulated learning. The participants were asked to complete the questionnaire by choosing from among five alternatives, from "almost never" to "always".

To analyze the collected data and to answer the research questions, four stepwise multiple regression analyses were used.

4. Results and Discussion

4.1. The first research question

The first question investigated types of language learning strategies as predictors of meta-cognitive self-regulated learning. To this end, a stepwise multiple regression procedure was used, which showed that cognitive, compensation, and meta-cognitive strategies inserted into the regression equation as the predictors of meta-cognitive self-regulated learning. Model summary (Table 1) shows that cognitive strategies and meta-cognitive self-regulated learning share over 21%, and cognitive and compensation strategies together share over 25% of the variance with meta-cognitive self-regulated learning. Cognitive, compensation, and meta-cognitive strategies collectively account for over 29% of the total variance with meta-cognitive self-regulated learning.

Table 1.
Model Summary[d] on meta-cognitive self-regulation

Model	R	R Square	Adjusted R Square	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
1	.470[a]	.221	.216	.221	41.690	1	147	.000
2	.518[b]	.268	.258	.047	9.383	1	146	.003
3	.555[c]	.308	.294	.040	8.481	1	145	.004

a. Predictors: (Constant), cognitive

b. Predictors: (Constant), cognitive, compensation

c. Predictors: (Constant), cognitive, compensation, meta-cognitive

d. Dependent Variable: meta-cognitive self-regulation

Based on Table 2, the results of the ANOVA ($F_{(1, 147)} = 41.69$, $p < .05$; $F_{(2, 146)} = 26.72$, $p < .05$); $F_{(3, 145)} = 21.55$, $p < .05$) show that the predictive power of all three models is significant.

Table 2.
ANOVA[a] on meta-cognitive self-regulation

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regres-sion	1175.998	1	1175.998	41.690	.000[b]
	Residual	4146.551	147	28.208		
	Total	5322.549	148			
2	Regres-sion	1426.396	2	713.198	26.726	.000[c]
	Residual	3896.154	146	26.686		
	Total	5322.549	148			
3	Regres-sion	1641.686	3	547.229	21.557	.000[d]
	Residual	3680.863	145	25.385		
	Total	5322.549	148			

a. Dependent Variable: meta-cognitive self-regulation
b. Predictors: (Constant), cognitive
c. Predictors: (Constant), cognitive, compensation
d. Predictors: (Constant), cognitive, compensation, meta-cognitive

To see how strong the relationship between the meta-cognitive self-regulated learning and each of the predictors is, the unstandardized as well as standardized coefficients of the three models, along with the observed t-values and significance levels were checked. Table 3 shows the results.

Table 3.
Coefficients on meta-cognitive self-regulation

Standardized Coefficients		Unstandardized Coefficients		t	Sig.
Beta		B	Std. Error		
	(Constant)	23.338	2.445	9.547	.000
.470	cognitive	.472	.073	6.457	.000
	(Constant)	19.958	2.621	7.614	.000
.354	cognitive	.356	.081	4.405	.000
.246	compensation	.223	.073	3.063	.003
	(Constant)	17.145	2.733	6.273	.000
.255	cognitive	.256	.086	2.978	.003
.230	compensation	.209	.071	2.931	.004
.228	Meta-cognitive	.183	.063	2.912	.004

a. Dependent Variable: meta-cognitive self-regulation

Based on Table 3, the first model shows that for every one standard deviation change in cognitive strategies score, there will be .47 of a standard deviation positive change in meta-cognitive self-regulated learning score. The second model shows that when cognitive and compensation strategies are taken together, for every one standard deviation change in cognitive and compensation strategies, there will be over .35 and .24 of a standard deviation positive change in meta-cognitive self-regulated learning score, respectively. The third model shows that when cognitive, compensation, and meta-cognitive strategies are taken together, for every one standard deviation change in cognitive, compen-

sation, and meta-cognitive strategies score, there will be over .25, .23, and .22 of a standard deviation positive change in meta-cognitive self-regulated learning score, respectively. Moreover, all the standardized coefficients are statistically significant.

4.2. The second research question

The second question sought to investigate the relationship between types of language learning strategies and task value as one of the components of motivational self-regulated learning. To this end, a second stepwise multiple regression procedure was run, which showed that meta-cognitive, memory, and affective strategies entered into the regression equation as the predictors of task value. Based on Table 4, meta-cognitive strategies and task value share about 18%, and meta-cognitive and memory strategies together share over 25% of variance with task value. Meta-cognitive, memory, and affective strategies collectively account for about 27% of the total variance with task value.

Table 4.
Model Summary[d] on task value

Model	R	R Square	Adjusted R Square	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
1	.437[a]	.191	.185	.191	34.625	1	147	.000
2	.511[b]	.261	.251	.070	13.884	1	146	.000
3	.532[c]	.283	.269	.022	4.542	1	145	.035

a. Predictors: (Constant), meta-cognitive

b. Predictors: (Constant), meta-cognitive, memory

c. Predictors: (Constant), meta-cognitive, memory, affective

d. Dependent Variable: task value

Based on Table 5, the results of the ANOVA ($F_{(1,147)} = 34.62$, $p < .05$); $F_{(2,146)} = 25.77$, $p < .05$; $F_{(3,145)} = 19.11$, $p < .05$) show that the predictive power of the three models are significant.

Table 6 shows the Beta value and significance level of the observed t-value for each of the three strategies that entered the regression equation. As the table shows, for every one standard deviation change in one's meta-cognitive strategies, there will be over .43 of a standard deviation change in one's task value. When meta-cognitive and memory strategies are taken together, for every one standard deviation change in meta-cognitive and memory strategies, there will be over .32 and .28 of a standard deviation change in the dependent variable, respectively.

Table 5.
ANOVA[a] results on task value

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	561.212	1	561.212	34.625	.000[b]
	Residual	2382.627	147	16.208		
	Total	2943.838	148			
2	Regression	768.118	2	384.059	25.772	.000[c]
	Residual	2175.721	146	14.902		
	Total	2943.838	148			
3	Regression	834.203	3	278.068	19.112	.000[d]
	Residual	2109.635	145	14.549		
	Total	2943.838	148			

a. Dependent Variable: task value
b. Predictors: (Constant), meta-cognitive
c. Predictors: (Constant), meta-cognitive, memory
d. Predictors: (Constant), meta-cognitive, memory, affective

When meta-cognitive, memory, and affective strategies are taken together, for every one standard deviation change in meta-cognitive, memory, and affective strategies score, there will be about .27, .25, and .16 of a standard deviation change in task value score, respectively. Moreover, all the standardized coefficients are statistically significant.

Table 6.
Coefficients[a] on task value

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.222	1.621		7.540	.000
	Meta-cognitive	.261	.044	.437	5.884	.000
2	(Constant)	8.075	1.912		4.224	.000
	Meta-cognitive	.195	.046	.326	4.235	.000
	memory	.215	.058	.287	3.726	.000
3	(Constant)	6.885	1.970		3.496	.001
	Meta-cognitive	.164	.048	.274	3.418	.001
	memory	.192	.058	.257	3.327	.001
	affective	.101	.047	.165	2.131	.035

a. Dependent Variable: task value

4.3. The third research question

The third question attempted to see which types of language learning strategies are predictors of control of learning beliefs as components of motivational self-regulated learning. To this end, a third stepwise multiple regression procedure was used, which showed that meta-cognitive strategies entered into the regression equation as the single predictor of control of learning beliefs. Model summary (Table 7) shows that meta-cognitive strategies and control of learning beliefs share over 8% of variance.

Table 7.
Model Summary[b] on learning beliefs

Model	R	R Square	Adjusted R Square	R Square Change	Change Statistics			
					F Change	df1	df2	Sig. F Change
1	.300[a]	.090	.084	.090	14.574	1	147	.000

a. Predictors: (Constant), meta-cognitive
b. Dependent Variable: control of learning beliefs

Based on Table 8, the results of the ANOVA ($F_{(1,147)} = 14.57$, $p < .05$) show that the predictive power of the model is significant.

Table 8.
ANOVA[a] results on learning beliefs

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	101.220	1	101.220	14.574	.000[b]
	Residual	1020.968	147	6.945		
	Total	1122.188	148			

a. Dependent Variable: control of learning beliefs
b. Predictors: (Constant), meta-cognitive

To see the strength of the relationship between control of learning beliefs and the predictor, the unstandardized as well as standardized coefficients of the model, along with the observed t-value and significance level were checked. Table 9 shows the results.

Table 9.
Coefficients[a] on learning beliefs

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.960	1.061		10.330	.000
	Meta-cognitive	.111	.029	.300	3.818	.000

a. Dependent Variable: control of learning beliefs

Based on Table 12, the model shows that for every one standard deviation of change in meta-cognitive strategies score, there will be .30 of a standard deviation change in control of learning beliefs score. Meanwhile, the relationship between meta-cognitive strategies and control of learning beliefs is statistically significant.

4.4. The fourth research question

The fourth question attempted to examine the relationship between types of language learning strategies and test anxiety as a component of motivational

self-regulated learning. To this end, a fourth stepwise multiple regression procedure was used, based on which communication strategies entered into the regression equation as the single predictor of test anxiety. Based on model summary (Table 10), communication strategies and test anxiety share over 4% of variance.

Table 10.
Model Summary[b] on test anxiety

Model	R	R Square	Adjusted R Square	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
1	.230[a]	.053	.046	.053	8.210	1	147	.005

a. Predictors: (Constant), communication
b. Dependent Variable: test anxiety

Based on Table 11, the results of the A0NOVA ($F_{(1,147)} = 8.21$, $p < .05$) show that the predictive power of the model is significant.

Table 11.
ANOVA[a] results on test anxiety

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	101.079	1	101.079	8.210	.005[b]
	Residual	1809.875	147	12.312		
	Total	1910.953	148			

a. Dependent Variable: test anxiety
b. Predictors: (Constant), communication

Table 12 shows the Beta value and significance level of the observed t-value for strategies that entered the regression equation. As the table shows, for every one standard deviation change in one's communication strategies, there will be .23 of a standard deviation negative change in one's test anxiety.

Table 12.
Coefficients[a] on test anxiety

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	21.901	2.210		9.912	.000
	communication	-.201	.070	-.230	-2.865	.005

a. Dependent Variable: test anxiety

4.5. Discussion

The findings of the present study are to some extent compatible with a number of previous studies, and in conflict with others. These findings are partially in

line with Zarei and Shahidi Pour (2013a), who reported a significant relationship between cognitive strategies and L2 idioms comprehension. Their findings also revealed the negative predictive power of affective strategies on L2 idiom comprehension. This is in contradiction with the present study in which communication strategies had negative predictive power on test anxiety, which may lead to learners' success in education.

In accordance with the findings of this study, showing the predictive power of cognitive strategies on meta-cognitive self-regulated learning and significant relationship between affective strategies and task value, Zarei and Shahidi Pour (2013b) found that cognitive and affective strategies are predictors of L2 idiom production. So, this corroborates the claims of Babbs and Moe (1983) and Pintrich and De Groot (1990), who believed that meta-cognitive strategies help learners analyze their own thinking and consequently, be engaged in the process of language learning. These finding are also in line with the findings of Oxford and Nyikos (1989), based on which learners with high levels of motivation use various strategies in the process of language learning. Thus, it can be concluded that cognitive and affective strategies are important factors in individuals' educational achievement.

The findings of the present study, on the one hand, support those of Neuville et al., (2007), who showed that motivational variables have an effect on self-regulated learning strategies, and self-regulated strategies affect performance. Much like this study, which showed significant relationships between meta-cognitive, memory, and affective strategies; and task value, they also found that task value affected learning strategies. On the other hand, the findings of the present study are in contradiction with their findings in that they showed no significant differences among the effects of motivational variables on performance. The results of the present study are also in conflict with Zarei's (2014) findings, based on which the relationship between neither reading anxiety and motivation nor reading anxiety levels and the choice of reading strategies was statistically significant.

In accordance with the results of the present study, Zarei and Gilanian (2014a, 2014b) reported significant relationships between language learning strategies and cognitive self-regulated learning. They also reported the predictive power of language learning strategies on various types of goal orientation as the other components of motivational self-regulation. In addition, the results of this study lend support to Pintrich's (1989) findings, based on which there was a significant relationship between various types of goal orientation and language learning strategies.

Similar to the findings of this study in which communication strategies turned out to have negative predictive power on test anxiety; while, affective, meta-cognitive and memory strategies had predictive power on task value, Yilmaz (2010) found that the use of affective strategies is negatively correlated with anxiety. As communication strategies can compensate for individuals' lack of knowledge and skills during communication (Oxford & Crookall, 1989) and since students have to communicate with others in the learning context, it may

be cogently argued that learners who are able to use communication strategies more than their classmates can reduce their anxiety and, consequently, have better performance in their education. This may explain Yilmaz's (2010) findings that affective strategies help learners to reduce their anxiety through controlling their emotion, motivation, and attitude in the language learning process (Oxford, 1990; Rubin, 1981).

In conflict with the findings of the present study, Hong-Nam and Leavell (2006) reported the least frequent use of affective and memory strategies among other strategies by students; in this study, both memory and affective strategies were used frequently and had a high correlation with task value.

The observed discrepancies between the findings of this study and those of the other related studies could be attributed to a number of factors. Some of these factors include students' level of proficiency, gender, social context, culture, and field of study, which were not variables in this study. Previous research (e.g., Hong-Nam & Leavell, 2006; Yilmaz, 2010; Zarei & Baharestani, 2014) has already established the existence of a relationship between some of the above factors (such as gender and proficiency level) and language learning strategy use. These areas of conflict between the findings of this study and those of the previous studies is probably indicative of the need to carry out further research in the area to resolve some of the controversies surrounding the issues.

5. Conclusion

The present study investigated language learning strategies as predictors of meta-cognitive and motivational self-regulated learning. The results indicated that cognitive, compensation, and meta-cognitive strategies were significant predictors of meta-cognitive self-regulated learning. Meanwhile, meta-cognitive, memory, and affective strategies were found to have predictive power on task value. The findings also showed that the single predictor of control of learning beliefs was meta-cognitive strategies. Another finding of the study showed that communication strategies had negative predictive power on test anxiety.

Based on the results, it can be concluded that various types of language learning strategies make differential contribution to predicting meta-cognitive and motivational self-regulated learning components. This means that the more frequent use of certain strategies may help to enhance learners' meta-cognitive and motivational self-regulation. For example, the negative predictive power of communication strategies on test anxiety implies that the enhancement of learners' communication strategies use will decrease their level of test anxiety. So, to improve students' success in education, focusing on appropriate strategies should be a priority.

Given the meaningful relationships between language learning strategies and meta-cognitive and motivational self-regulated learning components as

well as the findings of the previous studies (Neuville et al., 2007; Yilmaz, 2010; Zarei & Shahidi Pour, 2013a; Zarei & Gilanian 2014a, 2014b), the findings of the present study may have theoretical and practical implications for teachers, learners and material developers. If teachers and materials developers are cognizant of the nature of the relationships between meta-cognitive and motivational self-regulated learning components and language learning strategy use, they will be better prepared to make more informed decisions about introducing and encouraging the use of certain types of strategies (and probably discouraging the use of certain others) in the classroom, or about using useful instructional books and materials to encourage students to use those language learning strategies which have predictive power on meta-cognitive and motivational self-regulated learning components (task value, control of learning beliefs, and test anxiety). By designing the right kind of materials and adopting the right kinds of teaching activities (which require the students' use of certain strategies), materials developers and teachers may be able to contribute to improving learners' motivation and self-regulation, and by so doing, help improve learners' achievements. Teachers may play a more active role in the classroom by both creating awareness in learners about the mutual relationships between the above-mentioned variables and encouraging the learners to make more active and frequent use of those strategies that are more strongly correlated with motivational self-regulated learning components. They may even actively intervene to discourage the use of those learning strategies that are inversely related to self-regulated learning because these strategies may be counterproductive so far as the development of self-regulated learning is concerned. Probably the most important pedagogical implication could be for learners, who may adjust their learning strategies in such way so as to maximize their learning potential and to make their self-study practices as self-regulated as they can possibly be.

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