



Investigating the Role of Task Value, Surface/Deep Learning Strategies, and Higher Order Thinking in Predicting Self-regulation and Language Achievement

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This study aims to identify and investigate the role of task value (drawn from expectancy-value theory), surface/deep learning strategies, and critical thinking for predicting language learners' self-regulation and ultimate language achievement in a single framework. To this end, 190 participants, majoring in English at bachelor's level at a state university in Iran, were selected based upon convenience sampling. A structural equation model showed that both motivational and cognitive components were significant predictors of language achievement and self-regulation. The results reveal that task value is a positive predictor of deep/surface learning strategies and metacognitive self-regulation, which provides evidence that awareness of the importance and value of a task, directs learners to choose more appropriate self-regulation strategies to monitor their process of learning and structure their own cognitive manners. The findings demonstrated that critical thinking predicts improvement in language achievement. Theoretically speaking, it has been argued that the ability to critically analyze learning materials and evaluate information enables learners with advanced proficiency to actively take part in the learning process, be further dedicated to their tasks, and more effectively and efficiently engaged in learning strategies, therefore making more successful learners. Finally, the implication for teachers and policy makers is discussed.

Keywords: task value, critical thinking, surface learning strategies, deep learning strategies, self-regulation.

Introduction

The study of individual differences has been a predominant field of enquiry in Second Language Acquisition (SLA). The early treatments of individual differences have been devoted to classifying learners into good/bad, intelligent/non-intelligent, and motivated/non-motivated language learners through specific techniques. However, recently the trend has shifted to explain, rather than just identify, why some language learners, in contrast to others, are more successful (Horwitz, 2000). Among all, Dörnyei (2005) broadly defined individual differences as "enduring personal characteristics that are assumed to apply to everybody and on which people differ by degree" (p. 4). A number of researchers, namely Dörnyei (2005), Ellis (2004), Robinson (2002) and Skehan (1989), included factors such as language learning strategies, cognitive and affective factors, personality, motivation and learner beliefs in their lists of individual differences variables. In this study, the researchers investigate the dynamic

interplay between motivational strategies (task value), cognitive strategies (learning strategies, critical thinking), metacognitive strategies (self-regulation), and language achievement.

Expectancy-value theorists maintain that individuals' level of confidence and their academic skills can, to a great extent, pave the way for higher level of performance and academic achievement (Eccles & Alder, 1983). Task value was defined as the learners' perceptions of the interest, usefulness, importance and cost of a task, as a factor to predict the learners' decision to further follow the task or not (Wigfield & Eccles, 2002). McCoach and Siegle (2002) attributed the underachievement of students to their low task value. On the other hand, studies reported that students gluing a high value to the task will employ deeper cognitive and metacognitive strategies (McWhaw & Abrami, 2001; Pintrich, 1999).

The second variable taken into account in the current study is cognitive engagement, among which rehearsal and elaboration strategies regarded as the influential ones in academic achievement and performance (Weinstein & Mayer, 1986) were chosen. Cognitive engagement, commonly known as deep and surface learning strategies, is characterized by strategies such as elaboration, critical thinking, and concept integration for deep learning strategies, and memorization and reproduction of the learning materials for surface learning strategies (Fredricks, Blumenfeld, & Paris, 2004). Pintrich (1999) mentioned that rehearsal strategies, also called surface learning strategies, constitute strategies such as highlighting or underlining a piece of a text, the recitation of items to be learned or reading words out which can be regarded rather an unreflective manner in comparison with other cognitive strategies namely elaboration, critical thinking, and organization. Despite the fact that rehearsal strategies may not lead to deep learning, they can be employed by learners to attend to and pick up important information from materials and keep this information active in working memory. Elaboration strategies, as those taken by learners to store information into long-term memory by integrating and connecting the newly learned items to the already existing ones, comprise making paraphrases, making summaries, creating analogies, taking notes, connecting points, and explaining the ideas in the material to be learned to someone else (Weinstein & Mayer, 1986). The commonalities of these two strategies lie in this fact that both can be employed in simple memory tasks or more complicated tasks (Weinstein & Mayer, 1986).

Ruggiero (1989) defined critical thinking, also known as higher order thinking (Halpern, 1998), as the reflective thinking where the attention is to interpret, analyze, criticize, synthesize, and evaluate information to direct thoughts, beliefs, and actions. Due to its flourishing importance in teaching and learning, researchers have provided different definitions for critical thinking.

Sternberg (1986) defined it as "the mental processes, strategies, and representations people use to solve problems, make decisions, and learn new concepts" (p. 3). Also, Halpern (1998) characterized critical thinking as "the use of those cognitive skills or strategies that increase the probability of a desirable outcome" (p. 450); and Willingham (2007) described it as "seeing both sides of an issue, being open to new evidence that disconfirms your ideas, reasoning dispassionately, demanding that claims be backed by evidence, deducing and inferring conclusions from available facts, solving problems, and so forth" (p. 8). Pintrich (1999) referred to critical thinking as the extent to which learners employ existing knowledge to new situations so as to solve problems, decide, or make critical evaluations concerning the standards of excellence.

The other powerful predictor of academic achievement in foreign language learning which deserves remarkable attention is metacognitive self-regulation strategies. According to Zimmerman (2000), self-regulation strategies (SRL) can be defined as "self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (p. 14). SRL has attracted much attention from researchers and theorists of educational psychology which is often regarded as the core competence required for "learning to learn" (Zimmerman & Schunk, 2011, p. 11). Theoretically analyzing, a number of models have been proposed for self-regulation strategies (Panadero & Alonso-Tapia, 2014); however, the following features can be found common to many of the models: (a) a cyclical process, (b) comprised of cognition, metacognition, motivation, and emotion, and (c) a set of skills that can be developed and learned.

Pintrich (1999) explained the three general processes (planning, monitoring, and regulating) that

constitute metacognitive self-regulatory activities. Pintrich (1999) referred to *planning activities* as those to activate relevant aspects of prior knowledge, *monitoring activities* as self-testing and self-evaluation, and regulating process, as a cooperative activity, for fine-tuning and continuous adjustment of one's cognitive activities. *Regulating activities* are assumed to improve performance by assisting learners. To name but a few, studies on the efficacy of self-regulation strategies reported a positive correlation between metacognitive strategies and learners' motivation (Zimmerman & Schunk, 2008), between academic motivation, self-regulation, and achievement (Hsieh et al., 2012), and students' "lifelong learning" (e.g., De la Harpe & Radloff, 2000, p. 179).

Motivated by the works provided above and considering the imperative of achieving high level of language proficiency, identifying the contributing factors to learners' language mastery seems necessary. Therefore, this study aims to investigate the extent to which EFL (English as a Foreign Language) learners' proficiency in English is predicted by task value, self-regulated learning strategies (metacognitive strategies in the present study), and higher order thinking, and cognitive strategies (deep and surface learning strategies). The researchers believe the current study would extend our understanding of the affective, cognitive and metacognitive variables in determining language proficiency. First, the study would provide a test of the theoretical model combining variables such as task value, cognitive and metacognitive self-regulation strategies, critical thinking and language achievement which can also provide evidence for the direct and indirect relationships between the aforementioned variables. Second, the study would provide evidence of the applicability of this micro model to Iranian culture. Finally, while many of the published studies examined the relations of cognitive and metacognitive strategies as a whole without disintegrating their subcomponents, the present study would advance our perception of the predictive role of task value, critical thinking, deep and surface learning, and metacognitive self-regulation in language achievement in an EFL context.

Overview of the Hypothesized Model

Based upon the former studies and earlier data analyses, a model of L2 achievement was hypothesized to integrate five variables: task value, critical thinking, metacognitive self-regulation strategies and cognitive strategies (deep and surface strategies), and L2 achievement. The structural model proposed is based on the knowledge of theory and empirical research (Hair, Ringle, & Sarstedt, 2014). The initial model was hypothesized based on the following considerations.

Following the empirical study of Schunk (2005), and that of Kaplan and Maehr (2007), the researcher postulated a direct path from task value to cognitive strategies and from task value to metacognitive strategies, respectively. Also, as the study conducted by Joo et al. (2013), and Varasteh, Ghanizadeh and Akbari (2016) confirmed, a direct path was specified from task value to language achievement, and to deep strategies, in order.

Pintrich's (1999) study and that of Nata (2004) indicate a positive and direct effect for cognitive strategies on language achievement. Accordingly, the researchers have drawn a path from cognitive strategies to L2 achievement.

As shown by Pintrich et al.'s (1994) empirical study, metacognitive strategies through motivated behavior can indirectly lead to language achievement. Varasteh et al. (2016), and Mega, Ronconi, and De Beni (2014) also indicated that metacognitive strategies can directly and positively affect L2 achievement. As a result, we have drawn a path from metacognitive strategies to L2 achievement.

Richardson, Abraham, and Bond (2012) defined critical thinking as the ability to carefully examine learning material. Puzziferro (2008) found a weak but positive significant relationship between critical thinking and academic performance. Therefore, the researchers postulated a direct path from critical thinking to L2 achievement.

In a study conducted by Şen (2016), the result indicated a positive significant relationship between cognitive and metacognitive strategies ($\beta=.88$; $t=6.90$). Accordingly, a direct path was drawn between these two constructs.

Task value, on the one hand, has been found a significant variable in determining L2 achieving L2 tasks. This can be attributed to the fact that learners become more interested in the task they feel valuable, thus put more efforts to achieve a task. Critical thinking, on the other, is referred as the ability to carefully examine learning materials which can enable language learners to reach a higher level of proficiency. Such relationships between these two constructs have motivated the researchers to draw a path from task value to L2 achievement with the mediating effect of critical thinking.

H1, H2, H3, H4, and H5: Students' task value significantly and directly predicts their cognitive strategies, critical thinking, metacognitive self-regulation, deep learning, and language achievement.

H6: Students' cognitive learning strategies significantly and directly predict metacognitive self-regulation strategies, and language achievement.

H7: Students' metacognitive self-regulation strategies significantly and directly predict their language achievement.

H8: Students' critical thinking significantly and directly predicts their language achievement.

Review of Literature

Task Value

Based upon expectancy-value theory (Eccles & Alder, 1983; Wigfield & Eccles, 2000), students' beliefs regarding the extent to which they are self-assured in accomplishing an academic task (self-efficacy) and the degree to which they find the task worthy (task value) are two crucial modules for figuring out students' achievement behaviors and academic outcomes. Research has indicated the positive role of self-efficacy in predicting the performance outcomes of academic tasks namely mathematics, science, and reading (Schunk, Pintrich, & Meece, 2008), and the intention and actual decision in mathematics and English (Eccles & Alder, 1983). Task value concerns learners' views of the interest (also referred as intrinsic value in expectancy-value theory, enjoyment or intrinsic motivation), usefulness (students' perception that the task will be useful to meet some future goal), importance (attainment value or doing well on the task), and cost of a task (Wigfield & Eccles, 2002). Studies report that students devoting a high value to the task employ more profound cognitive and metacognitive strategies (McWhaw & Abrami, 2001).

Former studies have remarked that students would show more attempts and willingness on tests that are regarded more interesting, useful, and important than on those they view as boring, useless, and unimportant. Researchers have demonstrated that both task value and expectancy for success are associated with academic achievement (Eccles & Wigfield, 2002; Pintrich & Schunk, 2002). Task value has been demonstrated to be positively associated with performance and self-efficacy (Pintrich, 1999), and the adoption of mastery and performance goals and the ways students cognitively engage in their academic tasks (Ames, 1992). Task value has been found influential in language learners' choice behaviors, persistence, and effort (Wigfield & Eccles, 2000). In other words, those learners regarding high value for a task are more likely to take part in that activity, persist in that longer, and further endeavor in the same activity. In addition, despite the learners' competency to accomplish a task, if their task value is low, they tend not to participate. Considering task value as one of the motivational processes, Schunk (2005) highlighted the fact that the learners who feel a given task as related, essential, and valuable prefer to use cognitive strategies more often, leading to a positive learning outcome. Among the several relevant factors, task value is deemed as a meaningful determiner of learners' language achievement (Joo, Lim, & Kim, 2013).

Learning Strategies

Having classified learning strategies in to direct (memory, cognitive, and compensation strategies) and indirect (metacognitive, affective, and social strategies) ones, Oxford (1993) defined L2 learning strategies as “specific actions, behaviors, steps, or techniques that students employ often consciously to improve their own progress in internalizing, storing, retrieving, and using the L2” (p. 175). Research on L2 learning strategies and finding the relationships between learning strategies with other influential factors of successful learners have been of main interest to many language researchers (Stern, 1975). Successful L2 learners tend to utilize learning strategies more appropriately, effectively, and relevant to the requirements of the language task (Vandergrift, 2003). The other area in L2 learning strategies which has attracted significant attention from researchers and intellectuals is investigating the factors, namely demographic variables, task type, individual and cognitive styles, which influence the choice of language learning strategies (Liyana & Bartlett, 2013). Various studies have examined the relationships between language learning strategies and choice (McLaughlin, 1990; Wenden, 1991), goal/purpose of language learning (e.g., Oxford, 2011), successful/unsuccessful learning (Anderson, 2008; Griffiths, 2013), learning context (Irie & Ryan; 2015; Ushioda, 2015), learning goal/target (Dalton-Puffer & Smit, 2013; Papaja, 2014), age (e.g., Muñoz & Singleton, 2011), aptitude (Muñoz, 2014) and personality types (Ehrman, 2008).

Self-regulated Learning

A self-regulated learner is characterized as the learner, both aware of task requirements and his own, needs to optimize his learning experiences (McCann & Garcia, 1999). Self-regulated learners actively take strategies required for learning (Byrnes, Miller, & Reynolds, 1999) and consider learning as a controllable process: they continually plan for their goals, organize, monitor their progress, evaluate their actions, and regulate their cognition, motivation, and behavior (Pintrich, 2004). The reason for which highly self-regulated learners have been found to significantly excel those low ones can be attributed to the use of planning, organizational, and self-monitoring strategies (Pintrich et al., 1993). Pintrich and De Groot (1990) reported a positive correlation between motivational components and metacognitive self-regulation learning. Kim et al. (2015) explored the relation between self-efficacy and self-regulated learning strategies on EFL learners. The results revealed a positive correlation between these two variables, although the learners with higher self-efficacy tended to more employ self-regulation strategies. Bidjerano and Dai (2007) conducted a study to examine the relationship between the big-five model of personality traits and self-regulation strategies. The findings showed an overlap between the big-five model of personality traits and self-regulation strategies, which jointly contribute to academic achievements. Other studies, as an example, also indicated the positive relationship between self-regulation strategies and online technology self-efficacy (Puzziferro, 2008), achieving mastery over materials (Abara & Lokena, 2010), and L2 communication confidence (Csizér & Kormos, 2009).

Critical Thinking

Scriven and Paul (1987) defined critical thinking as the intellectually well-organized process of actively and proficiently conceptualizing, employing, scrutinizing, integrating, and/or evaluating information collected or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. Willingham (2007) described critical thinking as “seeing both sides of an issue, being open to new evidence that disconfirms your ideas, reasoning dispassionately, demanding that claims be backed by evidence, deducing and inferring conclusions from available facts, solving problems, and so forth” (p. 8).

A number of practical studies have been conducted to explore the relationships between critical thinking and other skills in language learning and other fields. Magno (2010) carried out a study on

university students in the Philippines to investigate the effect of metacognitive abilities on critical thinking skills using structural equation modeling. The results revealed that metacognition has a statistically significant effect on the language learners' critical thinking skill. As an attempt to examine the role of metacognitive strategies in critical thinking, Ku and Ho (2010) implemented research to test language learners on six thinking tasks using think-aloud technique. The data analysis showed that learners with higher critical thinking level were more inclined to use high-level planning and evaluating strategies. Yang and Wu (2012) did a study to explore the effect of Digital Storytelling (DST) on the academic achievement, critical thinking, and learning motivation of EFL learners. Interview results indicated that integration of technology in language learning classes, namely DST, can enhance learners' understanding of course content, willingness to explore, and ability to think critically.

Methodology

Participants

The participants in the present study, selected based upon convenience sampling, were 190 language learners majoring in English at bachelor's level at a state university in Iran. Among them, 110 learners were female and 80 were male. With the age range of 18 to 30 years, all were native to Iran. All the participants were considered high-intermediate to advanced learners of English.

Instruments

The survey form administered in this research comprised two sections. The first part consisted of items recording participants' demographic information, including name, gender, ethnicity, and age. The second section contained the items measuring students' task value, metacognitive self-regulation, cognitive learning strategies, critical thinking, and language achievement. These items were taken from the Motivated Strategies for Learning Questionnaire (MSLQ), developed by Pintrich et al. (1993) for assessing college students' motivational orientations and their use of different learning strategies for a college course (Pintrich et al., 1993). The item contents were adapted to measure students' motivational beliefs and learning outcomes in the context of learning English.

The Motivated Strategies for Learning Questionnaire (MSLQ), as a guide for assessing college students' motivational orientations and their use of different learning strategies for a college course, based on a general cognitive view of motivation and learning strategies, contains two sections. The motivation section consists of 31 items that assess students' goals and value beliefs for a course. The learning strategies section includes 31 items regarding students' use of different cognitive and metacognitive strategies and 19 items concerning student management of different resources. Descriptions of the measures and their Cronbach's alpha internal consistencies derived from the present sample are provided below.

Task value

Task value on MSLQ refers to the student's perception of how interesting, important, and useful the task is ("*What do I think of this task?*"). The difference between task value and goal orientation lies in the reason for which the student is participating in the task ("*Why am I doing this?*"). The section comprised 6 items with $\alpha = 0.90$. A sample item included in this scale is "*I am very interested in the content area of this course.*"

Learning strategies

Two principal types of learning strategies were investigated in this study. The first are surface learning strategies or lower-order strategies which are called rehearsal in MSLQ (Pintrich et al., 1995). Basic rehearsal strategies involve reciting or naming items from a list to be learned. These strategies are best used for simple tasks and activation of information in working memory rather than acquisition of new information in long-term memory (Pintrich et al., 1995). These strategies are assumed to influence the attention and encoding processes, but they do not appear to help students construct internal connections among the information or integrate the information with prior knowledge anxiety. This section consists of 4 items with $\alpha = 0.69$. One sample item in this scale is “*I make lists of important terms for this course and memorize the lists.*”

The second section assesses deep cognitive engagement or higher order strategies, also called elaboration in MSLQ (Pintrich et al., 1995), help students store information into long-term memory by building internal connections between items to be learned (Pintrich et al., 1995). Elaboration strategies include paraphrasing, summarizing, creating analogies, and generative note-taking. These help the learners integrate and connect new information with prior knowledge (Pintrich et al., 1995). This section, drawn from MSLQ, includes 6 items with $\alpha = 0.76$. Sample item included in this scale is “*When reading for this class, I try to relate the material to what I already know.*”

Metacognitive self-regulation

On MSLQ, metacognition refers to the awareness, knowledge, and control of cognition. It focuses on the control and self-regulation aspects of metacognition, not the knowledge aspect. There are three general processes that make up metacognitive self-regulatory activities: planning activities (such as goal setting), Monitoring activities (such as self-testing and questioning), and Regulating activities (Pintrich et al., 1993). The questionnaire ($\alpha = .7$ and consisting of 12 items) includes items such as “*I ask myself questions to make sure I understand the material I have been studying in this class.*”

Critical thinking

On the MSLQ, critical thinking refers to the degree to which students report applying previous knowledge to new situations in order to solve problems, reach decisions, or make critical evaluations with respect to standards of excellence. The questionnaire ($\alpha = .8$ and consisting of 5 items) includes items such as “*Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives.*”

Language achievement

Due to the fact that all the participants were selected among the EFL learners, their scores of the *General English Test* of their university entrance exam (*Konkur*) were taken into account.

Data Collection Procedures and Data Analysis

The data collection lasted for 2 months in the Fall semester of 2017. To collect the data, first the participants were instructed on how to fill out the questionnaires. To let them freely respond to the questions, there was not any force on the participants to write their names on the questionnaire.

The collected data were first input into the Statistical Package for the Social Sciences (SPSS) version 20 prior to being subjected to structural equation modeling (SEM) analysis, using SMARTPLS. All model parameters were estimated via maximum likelihood estimation.

PLS-SEM, consisting of measurement and structural models, works efficiently with small sample sizes and complex models and makes practically no assumptions about the underlying data in terms of data distributions (Hair et al., 2014). Furthermore, it can simply handle both reflective and formative measurement models. In addition, single-item constructs can be easily run with no identification problems (Hair et al., 2014). The other worth-mentioning benefit of PLS-SEM is its greater statistical power, compared with covariance-based SEM, reporting a specific relationship significant when it is in fact significant in the population. Considering all the pluses of the software, the researchers have decided to apply SMARTPLS for the intended aims.

Results

To analyze data by means of partial least squares, Hulland (1999) proposes a model of two stages: measurement model and structural model. Each consists of a definite set of criteria which will be further elaborated on in the following sections.

Measurement Model

Assessment of reflective measurement models includes composite reliability to evaluate internal consistency, individual indicator reliability, and average variance extracted (AVE) to evaluate convergent validity. Also, discriminant validity is obtained using the Fornell-Larcker criterion and cross loadings (Hair et al., 2014). Table 1 provides statistics about each criterion of the measurement model.

The reliability estimates of each variable computed via Cronbach's alpha are as follows: cognitive ($\alpha = .9$), critical thinking ($\alpha = .8$), deep ($\alpha = .9$), self-regulation ($\alpha = .9$), surface ($\alpha = .79$), and task value ($\alpha = .9$), showing an acceptable level of internal consistency for all variables.

Additionally, SMARTPLS provides researchers with the ability to apply a different measure of internal consistency, rather than just individual reliability, to compensate the limitations of Cronbach's alpha. In this type of reliability, the values between 0.70 and 0.90 can be regarded as satisfactory (Nunnally & Bernstein, 1994). Table 1 clearly represents the values that are quite acceptable within the range.

Regarding convergent validity, the extent to which a measure correlates positively with alternative measures of the same construct, is measured by AVE (average variance extracted) (Hair et al., 2014). As Table 1 shows, all the values are higher than .5, signifying an appropriate estimate for all the variables.

TABLE 1
Estimates of Reliability and Validity

Total	AVE	Composite Reliability	R Square	Cronbach's Alpha
Cognitive	0.609863	0.924396	0.717359	0.904297
Critical thinking	0.649080	0.880341	0.498017	0.818531
Deep strategies	0.764590	0.928514	0.920625	0.897332
Language achievement	1.000000	1.000000	0.643677	1.000000
Self-regulation	0.592758	0.919946	0.576981	0.900021
Surface strategies	0.609341	0.859839	0.857360	0.782425
Task value	0.788372	0.937016		0.909969

Furthermore, the proposed model complies with discriminant validity (Table 2) as all the square root of the AVE of each construct is higher than its highest correlation with any other construct (Fornell & Larcker, 1981).

TABLE 2
Cross Loading Correlation

Total	Cognitive	critical thinking	Deep strategies	language achievement	self-regulation	Surface strategies	task value
cognitive	0.780937						
critical thinking	0.770767	0.8056052					
deep strategies	0.857648	0.709413	0.87440				
language achievement	0.688923	0.767332	0.661924	1.000000			
self-regulation	0.733021	0.750563	0.694208	0.699330	0.769907		
surface strategies	0.725937	0.750660	0.778035	0.633051	0.688387	0.780602	
task value	0.846971	0.705703	0.842709	0.688035	0.726725	0.741323	0.887903

Structural Model

Having confirmed the reliability and validity of these constructs, the researchers investigated the structural model of the proposed scheme. This model enables researchers to represent the underlying theory/concept of the path model to determine how well the theory/concept can be confirmed via empirical data. To this end, the key measures such as significance of the path coefficients, the level of the R² values, the f² effect size, the predictive relevance (Q²), and the q² effect size are analyzed.

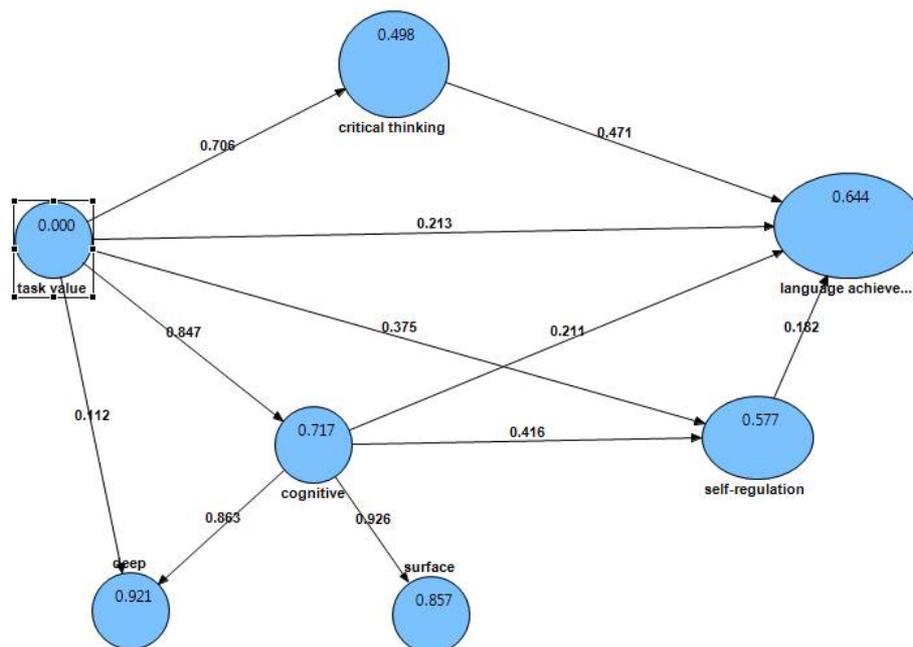


Figure 1. Factor loadings of latent unobserved variables.

As Figure 1 clearly represents, the coefficients for some paths are significantly higher (i.e., between cognitive and surface strategies) than other coefficients (such as task value and deep strategies). The closer the coefficients to one, the stronger the relationship between two constructs (Hulland, 1999). At this stage, the researchers have run bootstrapping to compute the empirical t-values associated with each parameter. As Figure 2 indicates, all the path coefficients between the latent variables are significant in which critical value for two-tailed tests is 1.96.

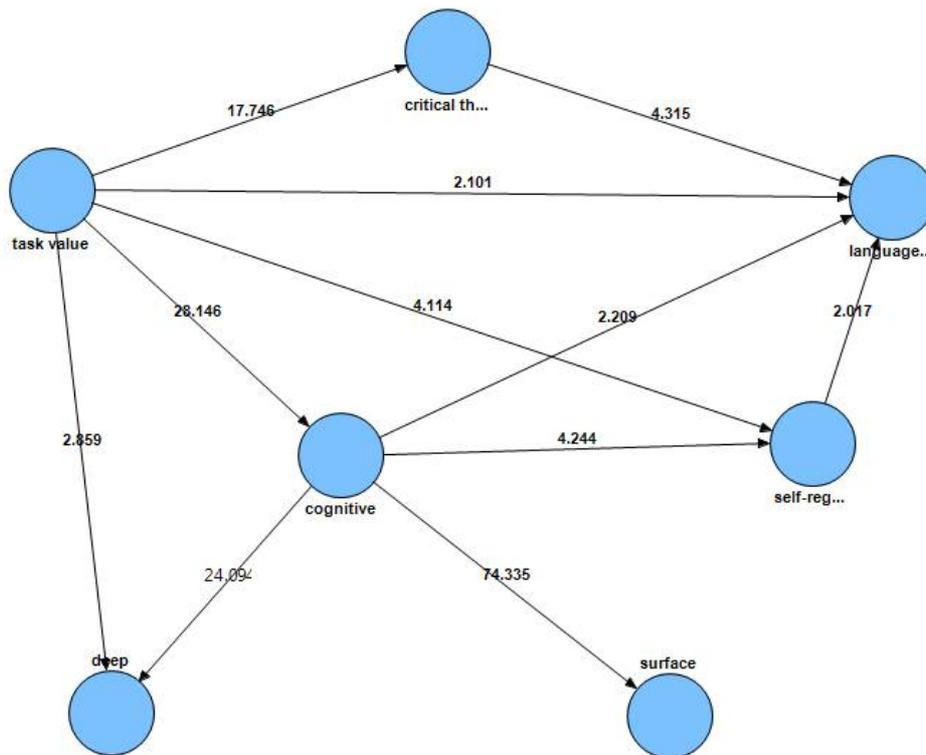


Figure 2. Path coefficients of latent variables.

Regarding the coefficient of determination (R^2), a measure of the model’s predictive accuracy, squared correlation between a specific endogenous construct’s actual and predicted values is calculated. R^2 , as the most commonly used measure of structural model, represents the exogenous latent variables’ combined effects on the endogenous latent variable. Its value ranges from 0 to 1, however, the values of 0.75, 0.50, or 0.25 for endogenous latent variables can be respectively described as substantial, moderate, or weak (Hair, Ringle, & Sarstedt, 2014). Its predictive accuracy increases as it goes more toward one. The results show that these are significant and all exceeded 0.4. For example, 72% of variances in cognitive strategies can be predicted by task value.

Researchers also examine Stone-Geisser’s Q^2 value (Geisser, 1974; Stone, 1974), besides the coefficient of determination, to measure the model’s predictive relevance. This is done by resampling procedure, also known as bootstrapping, and is applied just for reflective models not the formative ones. In the structural model, Q^2 values more than zero prove the path model’s predictive relevance for a certain reflective endogenous latent variable. As provided in Table 3, all the latent variables exhibit a significant level of predictive relevance (higher than 0.3).

TABLE 3
Stone-Geisser’s Q^2 value

Total	1-SSE/SSO
Cognitive strategies	0.430376
Critical thinking	0.312521
Deep strategies	0.699324
Language achievement	0.617017
Self-regulation	0.327307
Surface strategies	0.520300

The last statistical procedure which has been administered in the study relates to Goodness of Fit (GOF). The calculated index of GOF for the current study is 0.62, representing a good criterion to

confirm the model (Wetzels, Odekerken-Schroder, & van Oppen, 2009). Thus, the estimated model has demonstrated adequate fit to the data, as indicated by GOF index.

Discussion

The data analysis revealed that the hypotheses raised in the present study were confirmed. The results are in line and in contrast to several studies that will be elaborated on in the following sections.

Relationship between Task Value, Cognitive and Metacognitive Strategies, Critical Thinking, Deep Learning and Language Achievement

Eccles (1983) defines task value as the belief that language learners have about the task at hand which can predict the decision whether follow learning or not. This relates to learners' perception of how interesting, useful, and important the task is (Nata, 2004).

The results indicated a positive and direct effect for task value on metacognitive self-regulation strategies among Iranian EFL learners. It can be argued that when learners are aware of the importance and value of a task, they are more inclined to choose more appropriate self-regulation strategies to monitor their process of learning and structure their own cognitive manners. And expectedly, task value can predict the extent to which learners take advantage of their metacognitive strategies. This, as a result, can be claimed that task-related beliefs can arouse language learners to regulate their strategies for better performances. This finding is in harmony with that of Zimmerman (2000) who has highlighted that the learners with high task value (as a motivational component) tend to employ more metacognitive and cognitive strategies to be successful.

Also, it was identified that task value is a significant predictor of cognitive strategies. Shunk (2005) regarded task value as one of the motivational processes which can motivate language learners to more frequently employ their cognitive strategies. Thus, it can be contended that when individuals find a task important and useful, they are likely to take a more active role in the assignments, exert more efforts, devote more amount and quality of time to learning, and show further perseverance on achieving the task. This corroborates Nata's (2004) study which relates learners' academic motivation to their language learning strategies use.

The other significant result of the present study is the positive and significant role of task value in deep learning and language achievement. Learners' perception of the value and importance of the task and engagement in learning strategies allow them to more actively use deep learning strategies, e.g., connect ideas to each other and create analogies, process information, thereby leading to more language achievement (Joo et al., 2013). This can be assumed that when learners find a task related, valuable and important, they tend to draw upon their pre-existing knowledge and connect them to newly acquired information for higher performances. This is in line with studies conducted by Pintrich (1993), Pintrich and De Groot (1990), Varasteh et al. (2016) which reported positive relationships between task value, deep learning strategies, and learning outcome. Additionally, Joo et al. (2013) contended task value as a meaningful predictor of learners' achievement.

The data analysis also demonstrated that task value through the mediating effect of critical thinking can predict the learners' achievement. Critical thinking has been defined as thinking that is goal-directed and purposive, "thinking aimed at forming a judgment," where the thinking itself meets standards of adequacy and accuracy (Bailin et al., p. 287). The direct effect of critical thinking on language mastery can be supported in this light: Iranian higher scorers on the critical thinking scale tend to employ techniques such as inferring, analyzing, inductive/deductive reasoning, arguing and a number of higher order thinking skills to enhance their language achievement. It would be worth claiming that the learners finding a task valuable and important enough may be more inclined to further critically examine the task and assess the possible ways to achieve it.

Relationships between Cognitive Strategies, Metacognitive Self-regulation Strategies and Language Achievement

The findings revealed that cognitive strategies directly predict metacognitive self-regulation strategies and language achievement. Self-regulation learning consists of three components: metacognitive strategies (planning, monitoring, and modifying cognition) (Nata, 2004); learner's management and control of their efforts (Nata, 2004); and actual cognitive strategies (Pintrich & De Groot, 1990). This can be well justified as follows: when a learner, as a result of high task value, is motivated to accomplish a task, she/he endeavors to apply his/her cognitive strategies, namely deep and surface learning ones, to process the learning material, relate ideas to each other, and actively construct her/his knowledge. Aware of task requirements, self-regulated learners set standards and goals to achieve, adapt and regulate their cognitive strategies through planning and monitoring their cognition, organizing their activities, and structuring their behaviors and actual deeds, and any other necessary strategies to optimize learning experiences. This would imply that cognitive strategies have direct effects on the metacognitive self-regulation ones. Identical findings were reported in studies such as Ghanizadeh and Mirzaee's (2012), which reported a direct relationship between these two strategies.

As indicated in the model, cognitive strategies positively affect language achievement. Employing cognitive strategies provides learners with the opportunity to integrate ideas and pull information together which can influence learners' mastery and performance goal. This is in line with the studies done by Pintrich et al. (1993) and Nata (2004) that attributed learners' achievement to cognitive learning strategies resulting from the amount of time and motivation that learners devote to tasks.

Relation between Metacognitive Self-regulation Strategies and Language Achievement

The data analysis yielded that self-regulation is positively correlated with language achievement. Self-regulated learners use planning activities such as setting their learning objectives and goals and analyzing tasks to demonstrate more performance and mastery in the task. Besides, learners may tend to utilize strategies, namely questioning, by which they can be attentive while doing other tasks. They also can take advantage of regulation activities to cognitively and behaviorally control the learning process. Therefore, it can be inferred that the individuals' language learning can improve when using self-regulation strategies. These strategies can raise learners' abilities to more efficiently and effectively perform tasks. It should be noted that when a goal is set, a self-regulated language learner becomes motivated to activate the prior knowledge and integrates background and new knowledge in a comprehensive way. Organizing and monitoring the integration of pieces of information followed by continuous adjustments of cognitive activities help learners choose the best ways to proceed on a task. This corroborates the findings of Schraw, Crippen and Hartley (2006) which reported that self-regulated learners make more attempts and insist on completing tasks.

Relation between Critical Thinking and Language Achievement

The other objective of the present study was to explore the possible relationship between language learners' critical thinking skills and their language achievement. The study set out to investigate such a relationship based on the proposed model, signifying that critical thinking significantly (t value= 4.315) predicts improvement in language achievement. Theoretically speaking, according to the structural model, this finding can be elucidated in light of learners being empowered with analytic minds. The ability to critically analyze learning materials and evaluate information enables learners with advanced and complex proficiency to actively take part in the learning process, be further dedicated to their tasks, more effectively and efficiently engaged in learning strategies, thereby becoming more successful learners.

Such ability provides learners with a more resourceful mind to meticulously scrutinize and analytically explore ways of reaching optimal learning. Thus, it can be claimed that critical thinking is an influential component for language learners to achieve higher level of success. The findings of the present study are in congruence with empirical studies of Ghanizadeh and Mirzaee (2012), and Lee and Loughran (2000) in which learners' higher-order thinking skills were associated with their academic success. Also, the results are consistent with the work of Kealey, Holland and Watson's (2005) who indicated the positive relation between students' critical thinking and their academic achievement.

Conclusion and Implications

The present study aimed at investigating the structural relationships among the variables of task value, cognitive and metacognitive self-regulation strategies, and critical thinking in predicting language achievement of language learners, and yielded several findings as discussed in the previous sections. After analyzing the model, it was indicated that the extent to which language learners find tasks useful and valuable, employing required strategies, and owning appropriate reasoning abilities are strong and significant predictors of academic performance. All the proposed paths in the model were confirmed; some correlations were found more significant than others, though.

The findings of the present study have important implications for educationalists and policy-makers to equip language learners with the abilities to achieve more competencies based upon task value, cognitive and metacognitive strategies, and critical thinking. Instructors and teachers are expected to be aware that students tend to show more effort and employ more appropriate cognitive strategies when they feel a task interesting, valuable, and important. This, therefore, can lead to increased academic performance as Joo et al. (2013) regarded task value as a meaningful determiner of learner's language achievement. Learners would be inclined to be more devoted to a task as they find it interesting and are likely to take a more active role when processing information. Also, they seem to use more monitoring and planning activities to structure their own ideas. Thus, teachers and policy makers, even material developers, should be cognizant of the fact that learners' perceptions of how useful, important, and valuable the task is can contribute to more motivated learners, paving the way for further language achievement. As a result, teachers should implement necessary strategies to provide situations appropriate for enhancing learners' performance and mastery goals. With this aim in view to stimulate language learners' sense of task value, course designers could incorporate authentic and real tasks which are related to learners' future jobs. For example, for high education level learners who intend to follow their studies abroad in an English-speaking country, the incorporation of real tasks such as making requests, submitting job reports, giving annual reviews, etc. can be quite inspiring to perceive the tasks meaningful and relevant, which in turn leads to more intention to draw on cognitive and metacognitive strategies to perform the assignments. Also, to activate the sense of importance and relevance in tasks, teachers can give language learners voices and opportunities to choose the type of academic activities, e.g., written or oral ones. This volition could make them more interested in the activities they are assigned to do.

Also, university lecturers and instructors are highly recommended to empower their learners with cognitive, higher order thinking skills, and metacognitive self-regulation strategies necessary for academic performance. Employing cognitive strategies, on the one hand, provides learners with the opportunity to integrate ideas, and pull information together and using self-regulation strategies, on the other, equips learners to cognitively and behaviorally structure their actual deeds. The learners able to use cognitive strategies, such as questioning, and self-regulation strategies, namely self-monitoring, are more likely to achieve a higher level of proficiency, as reported in previous studies (e.g., Nata, 2004; Pintrich et al., 1993). Teachers should highlight the importance and significance of developing cognitive and metacognitive strategies in enhancing academic performance by techniques such as attempts to paraphrase, endeavors to summarize, drawing analogies between different parts of information, continuous evaluation of their own progress and so on. Also, employing strategies to check learners'

understanding of tasks and content, such as “*what does this passage talk about?*” “*what does the author imply,*” and providing learners with opportunities to reflect on their learning by asking questions such as “*what could X have done?*” can enhance language achievement. Additionally, teachers need to take particular heed to design activities with attainable goals which can encourage language learners to make efforts to achieve the targets.

The other contribution of the present study is that critical thinkers are more likely to reach a high level of achievement which can be attributed to the reasoning skills and analytic mind of learners when faced with learning situations. The ability to critically analyze learning materials and analytically process information enables learners to far effectively get engaged in tasks and participate in learning activities, as discussed in Lee and Loughran (2000). To break the cycle of rote learning, the first step is to ask open-ended questions which force learners to think such as “*what other solutions can you think of to eradicate the problem?*” or “*How can one have higher self-confidence?*” To critically think and effectively reason, teachers can involve their learners in healthy debates, individually or chorally, presenting lectures, and peer assessments to provide learners with chances to criticize others’ opinions and defend their logic. This can help them to share viewpoints, brainstorm, and weigh the pros and cons to reach an effective decision. Therefore, teachers and instructors should be well-trained to embed activities which can increase learners’ higher-order thinking and mentality.

The current study, like any other study, is not void of limitations. First, the participants were selected according to a convenience sampling from some universities in Iran, which makes it difficult to generalize the findings to other contexts. Second, the participants were asked to respond to a set of questions on the paper in the form of questionnaires, while other techniques such as interview or observations would be useful. The third shortcoming of the study is related to the use of task value as one of the components of expectancy value theory (Eccles et al., 1983). Further research can include self-efficacy as the other effective variable in predicting language achievement. In the same vein, deep and surface learning together with critical thinking were chosen from cognitive strategies in this study that can make the findings too narrow to generalize to other aspects of cognitive strategies. Therefore, interested researchers can consider other subcomponents of both cognitive and metacognitive strategies to predict their roles in determining language achievement.

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