The role of task value, effort-regulation, and ambiguity tolerance in predicting EFL learners' test anxiety, learning strategies, and language achievement

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Abstract A primary objective of education is to prepare individuals to be effective learners. This entails developing the cognitive, motivational, and metacognitive knowledge. From the perspective of educational psychology, existing psychological paradigms present diverse visions of the nature of the learner. To be an effective learner, as Jarvis (2005) contended, involves adopting an eclectic position and developing an adequate level of each paradigm. This study is an attempt to identify and examine the interrelationship among a host of cognitive, motivational, and metacognitive variables within a single framework. In particular, task value, metacognitive self-regulation, and ambiguity tolerance and their role in predicting learner's test anxiety, learning strategies, and language achievement were studied. The participants included 180 English as foreign language (EFL) learners with M.A. and B.A. degrees from a university in Mashhad, Iran. To measure the variables, two sets of questionnaires were employed. Task value, metacognitive self-regulation, test anxiety, and learning strategies were assessed through the Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich et al. (1993). To gauge ambiguity tolerance, the Ambiguity Tolerance in Second Language Learning Questionnaire (SLAT) designed by Ely (1995) was utilized. The results estimated via structural equation modeling (SEM) revealed that learners' self-regulation had a significant influence on language achievement. There was also a positive and direct association between cognitive components and metacognitive components. Additionally, it was found that the students' motivational components had a significant association with cognitive components. Finally, motivational and cognitive factors indirectly influenced on language achievement.

Keywords Task value · Self-regulation · Ambiguity tolerance · Test anxiety · Learning strategies · Language achievement

Introduction

Any learning endeavor is under the influence of an array of variables and its psychological foundation is shaped by the individual differences. Thus, in order to enhance learning process in educational settings, the individual differences must be recognized and attended to. Individual differences encompass motivational, cognitive, and metacognitive factors. In this study, we examine the dynamic interplay between motivational strategies (task value and test anxiety) and cognitive strategies (ambiguity tolerance and learning strategies) and metacognitive strategies (self-regulation) and language achievement. This study is an attempt to incorporate the relational pattern of the above mentioned variables among EFL learners. Specifically, we present a model depicting connections and causal relations among these factors. Hence, the present study will aim to: 1) uncover the relationship between motivational, cognitive, and meta cognitive strategies among EFL learners, 2) predict the role of task value, self-regulation, ambiguity tolerance in EFL learner's learning strategies, 3) investigate the role of task value, self-regulation, and ambiguity tolerance in EFL learner's test anxiety, 4) study the role of task value, self-regulation, and ambiguity tolerance in EFL learner's

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achievement, 5) explore the impact of task value, self-regulation, and ambiguity tolerance on EFL learner's test anxiety, learning strategies and achievement. And finally, the study seeks to put forward a number of pertinent recommendations to improve learner's motivation and learning strategies in order to enhance their academic achievement.

As stated earlier, this study goes for task value and test anxiety from motivational dimension. Task value is related to the belief that the task one performs is valuable to one self and tends to predict the decision on whether to pursue learning further or not (Eccles 1983). It focuses on a student's evaluation of how interesting, how useful, and how important a particular task is (Nata 2004). Test anxiety is a characteristic that is applicable to educational practices (Pintrich and Schunk 2001). Most prominent studies in this area (Hedl 1972; Sarason 1975; Spielberger 1972; Trent and Maxwell 1980) viewed test anxiety as a trait − a fairly constant personality characteristic that stimulates an individual to react to threatening situations with sometimes debilitating psychological, physiological, and behavioral responses. There is an extensive volume of empirical evidence of the negative effects of test anxiety on academic performance (Hancock 2001).

In the present study, learning strategies and ambiguity tolerance were chosen from cognitive components. In terms of cognitive learning strategies, following the work of Weinstein and Mayer (1986), rehearsal and elaboration were identified as important cognitive strategies related to academic performance in the classroom (McKeachie, Pintrich, Lin, & Smith, 1986; Pintrich and De Groot 1990). These strategies can be applied to simple memory tasks (e.g., recall of information, words, or lists) or to more complex tasks that require comprehension of the information (e.g., understanding a piece of text or a lecture) (Weinstein and Mayer 1986). Pintrich (1999) stated that rehearsal strategies involve the recitation of items to be learned or the saying of words aloud as one reads a piece of text. Highlighting or underlining text in a rather passive and unreflective manner can also be more like a rehearsal strategy than an elaborative strategy. These rehearsal strategies are assumed to help the student attend to and select important information from lists or texts and keep this information active in working memory, albeit they may not reflect a very deep level of processing. Elaboration strategies include paraphrasing or summarizing the material to be learned, creating analogies, generative note-taking (where the student actually reorganizes and connects ideas in their notes in contrast to passive, linear note-taking), explaining the ideas in the material to be learned to someone else, and asking and answering questions (Weinstein and Mayer 1986).

The second cognitive factor pertaining to the present study is language learning ambiguity tolerance. English learning is a very challenging task, for the learners who are encountered with new pronunciation, vocabulary, and syntax systems, as well as diverse cultural norms. Expectedly, learners will resolve these unfamiliar situations with the help and use of their learning strategies. The learner's degree of ambiguity tolerance will greatly help them overcome these uncertain situations. Tolerance of ambiguity was initially proposed by Frenkel Brunswick. Later, some scholars (Ely 1995) generalized it to the field of second language acquisition (SLA). Although more and more researchers appreciate the importance of tolerance of ambiguity in effective learning, its contribution to second language learning has not been explored adequately. It is still not clear how tolerance of ambiguity can influence the use of language learning strategies and how tolerance of ambiguity can influence learning achievement.

Besides motivational and cognitive strategies, students' metacognitive knowledge and the use of metacognitive strategies can have an important influence upon their achievement. Thus, in this study self-regulation was selected from metacognitive component. Pintrich et al. (1999) have proposed that metacognitive self-regulation concerns with learners' monitoring, managing, and structuring their own cognitive manners and actual deeds.

In sum all these factors or strategies are expected to be essential for learners in enabling them to enhance their (language) learning by helping them modify their learning styles and their understanding. In order to conceptualize the associations between these factors theoretically, the following section delves into these variables consecutively.

Factors related to test anxiety

Spielberger and Vagg (1995) defined anxiety as the emotional state consisting of feeling, tension, apprehension, and its effects on the nervous system. One of the most prevailing areas prone to anxiety is testing situation. Both current thinking in the area of test anxiety research and a casual glance at the literature demonstrate that test anxiety is meaningfully associated with a wide array of personal variables (Zeidner 1998). Rand et al. (1991) contented that test anxiety research may benefit from combining individual differences in test anxiety with individual differences in the need for achievement when explaining differences in test performance (as cited in Zeidner 1998). Many studies have shown that there is a significant negative correlation between test anxiety and students' performance (e.g., Onyeizugbo 2010). AbdulWahab (2010) stated that learners with anxiety develop a passive attitude toward their studies such as, lack of interest in learning, poor performance in exams and assignments. Aronen et al. (2005) found that there was a high negative correlation between the levels of anxiety and working memory, distraction, and reasoning in students. Pintrich et al. (1993) reported that test anxiety was negatively correlated with task value. About 10 million students at schools and about 15 % to 20 % of university students in USA experience test anxiety (Chapell et al. 2005).

Moreover, research showed that older learners feel more stressed than younger learners, and female students experience more anxiety than male students (Ginter et al. 1982).

Factors related to task value

Task value has been found to be positively correlated with cognitive strategy use including elaboration and organizational strategy. In addition, task value has been reported to be associated with performance and self-efficacy (Pintrich 1999). There are also empirical links between the adoption of mastery and performance goals and the ways students cognitively engage in their academic tasks (Ames 1992; Dweck and Leggett 1988). Kaplan and Maehr (2007) noted that when engaged in a task (e.g., a classroom assignment), different people (e.g., students with different characteristics) might engage in different types of self-regulated action, depending on their purpose of engagement. Schunk (2005) considered task value as one of the motivational processes, and contended that learners who perceive a given task as relevant, important, and useful tended to use cognitive strategies more frequently, resulting in a positive learning outcome (Joo et al. 2013). Among the numerous variables related to language achievement, task value is discussed as a meaningful predictor of learner's language achievement (Joo et al. 2013).

Factors related to ambiguity tolerance

Due to cultural and linguistic disparities, language learning is naturally associated with a host of uncertainties and ambiguities (Ely 1995). For example, when learners encounter new lexical and grammatical structures, they often face deficiency or even paucity of information. Furthermore, ambiguity may arise from cultural conflicts leading to incongruence in language use and comprehension (Chapelle and Roberts 1986; Grace 1998). Ambiguity in language learning can result in anxiety (Ehrman 1999; Oxford 1999). McLain (1993) reported that learners with high ambiguity tolerance are more eager to take risks and open to alteration (Rubin 1975; Stern 1975; Naiman et al. 1978) and higher task value and higher levels of language achievement (Naiman et al. 1978). More recently, research on ambiguity tolerance focused on its relation with other personality characters (Ehrman and Oxford 1990), language achievement (Chapelle and Roberts 1986; Naiman et al. 1978; Lori 1990), and reading comprehension (El-Koumy 2000).

Factors related to cognitive learning strategies

Learning strategies refer to the structures by which learning is achieved. Engagement in learning strategies permits learners to actively process information, thereby influencing their mastery of material and academic language achievement (Pintrich et al. 1993). Pintrich et al. (1994) noted that learners academic motivation relates to their learning strategies. A learner's learning strategy depends on the learner's motivation, the amount and quality of time devoted to learning, and the learners' belief in his/her achievement (Nata 2004). Various studies have examined learning models that are related to motivation as well as learning strategies which are linked to academic performance (Schiefele 1991, as cited in Nata 2004).

Factors related to self- regulation

According to Pintrich et al. (1993), there are three important components for self-regulated learning of classroom performance. The first component includes learner's meta-cognitive strategies for planning, monitoring, and modifying their cognition (Nata 2004). The next component involves learner management and control of their efforts on classroom academic tasks; it involves learners who persist at difficult tasks and maintain their cognitive engagement in the task, enabling them to perform better (Nata 2004). The third component involves the actual cognitive strategies such as rehearsal (surface), elaboration (deep) strategies which are found to foster active cognitive engagement in learning and result in higher levels of achievement (Pintrich and De Groot 1990). Self-regulation has been found to be positively correlated to achievement, with highly self-regulated learners being more motivated to use planning, organizational, and self-monitoring strategies than low self-regulated students (Pintrich et al. 1994, Ghanizadeh and Mirzaee 2012). Pintrich and De Groot (1990) found a positive correlation between motivational components and meta-cognitive self-regulation learning.

To put it in a nutshell, the effort of understanding how motivational, cognitive, and metacognitive components are related and influence learners' language achievement is not only crucial for integrating the existing theories of motivation and learning strategies but also fundamental for shedding light on the learners' academic achievement. Although there are a host of models of motivation that may be relevant to learners' language learning (Ghanizadeh and Rostami 2015), here we study the relation between these components in a unified framework in order to present a new model on the associations between motivational, cognitive, and metacognitive learning strategies and language achievement.

Method

This study is a causal research with significant attempt to examine and identify the interrelationship between task value, self-regulation, and ambiguity tolerance and their role in predicting learner's test anxiety, learning strategies and

language achievement. The Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich et al. (1993) was used for assessing the participants' motivational orientations and their use of different learning strategies (Pintrich et al. 1993), and the Second Language Ambiguity Tolerance (SLAT), developed by Ely (1995) was used for measuring the participant's ambiguity tolerance in learning language. It is the only scale designed to measure ambiguity tolerance in second language learning. A major criterion in the design of the SLAT scale was that items represent a broad spectrum of language activities: listening, speaking, reading, writing, pronunciation, and grammar. Another significant reason for the selection of SLAT in language learning derived from a study by Durrheim and Foster (1997) who suggested that within a single individual, high levels of ambiguity tolerance within one content might associate with low levels in another domain and might be unrelated to ambiguity tolerance in a third domain.

Participants

The sample was chosen according to a convenience sampling among graduate and undergraduate English university students studying at Imam Reza International University, Mashhad, Iran. The sample included 180 EFL learners whose age ranged from 19 to 31 years (M = 22.16, SD = 3.21). They were B.A and M.A students studying in English teaching and translation.

Measures

The questionnaires that were administered in this study consisted of three sections: The first section included instruction. The second section contained items about the participants' demographic information, including gender, age and GPA (grade point average). The third section consisted of questions which comprised two parts. The first part contains 33 items measuring task value, self-regulation, test anxiety, and learning strategies. 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 second part contained 12 items which were taken from the Ambiguity Tolerance in second language learning questionnaire or SLAT.

Descriptions of the measures and their Cronbach's alpha internal consistencies derived from each questionnaire are provided below.

Task value

On the MSLQ, task value refers to students' perceptions of the course material in terms of interest, importance, and utility.

The items measuring task value were drawn from MSLQ and consisted of 6 items with alpha = 0.90. Sample item included in this scale is "I think I will be able to use what I learn in this course in other courses".

Test anxiety

On the MSLQ, test anxiety is thought to have two components: a worry, or cognitive component, and an emotionality component (Pintrich et al. 1995). The worry component refers to students' negative thoughts that disrupt performance, while the emotionality component refers to affective and physiological arousal aspects of anxiety (Pintrich et al. 1995). The items were drawn from MSLQ and consisted of 5 items with alpha = 0.80. Sample item included in this scale is "When I take a test I think about how poorly I am doing compared with other students".

Cognitive learning strategies

Two dominant types of learning strategies were chosen in this study. First, 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 was extracted from MSLQ and consisted of 4 items with alpha = 0.69. Sample item included in this scale is "When I study for this class, I practice saying the material to myself over and over".

Second section measures deep strategies or higher order strategies which are called elaboration in MSLQ (Pintrich et al. 1995). Elaboration strategies 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 learner integrate and connect new information with prior knowledge (Pintrich et al. 1995). This section was taken from MSLQ and consisted of 6 items with alpha = 0.76. Sample item included in this scale is "When I study for this class, I pull together information from different sources, such as lectures, readings, and discussions".

Self-regulation

On the MSLQ, metacognition refers to the awareness, knowledge, and control of cognition. There are three general processes that make up metacognitive self-regulatory activities: planning, monitoring, and regulating. This questionnaire was

drawn from MSLQ and consisted of 12 items with alpha =0.79. Sample items included in this scale are "During class time I often miss important points because I am thinking of other things"; "When reading for this course, I make up questions to help focus my reading".

The response categories for the task value, test anxiety, rehearsal, elaboration and self-regulation scales ranged from 1 (not at all true of me) to 7 (very true of me).

Ambiguity tolerance

Ely (1989) defined second language ambiguity tolerance (SLAT) as a cognitive style and a possible antecedent of strategy use. Ehrman and Oxford (1990) also defined SLAT as a cognitive style: "tolerance of ambiguity is another important style dimension; those who can more readily tolerate ambiguity often show better language learning performance than those with less such tolerance" (p.311). The SLAT questionnaire comprises 12 items. Sample items included in this scale are "when I am reading something in English, I feel impatient when I do not totally understand the meaning"; "It bothers me that I do not understand everything the teacher says in English". The response categories for this scale are as follows: 1 (strongly agree), 2 (agree), 0 (undecided), 3 (not agree), 4 (strongly disagree). The Cronbach's alpha internal consistency reliability for SLAT is .82 (Ely 1995).

Language achievement

In this study, we used GPA (great point average) for measuring language achievement of EFL learners. It is a common way which is used in universities in order to define EFL students' language achievement.

Procedure

The data collection of this study took place in December 2014. In this study, for collecting the data, the battery of questionnaires were distributed among English language learners to answer the questions. Before the participants responded, they were informed with general instruction for filling the questionnaire, and also they were notified that it is not necessary to write their names on the questionnaires. The participation was totally voluntary and the confidentially considerations were observed.

Data analysis

In order to analyze the data in this study, the responses that were obtained from the questionnaires were analyzed with SPSS (20) software. A structural equation modeling (SEM) utilizing LISREL 8.5 was performed to examine the cause-effect relations among EFL learners motivational, cognitive, and meta-cognitive components.

Results

Table 1 presents descriptive statistics of the variables in question, i.e., EFL learners' task value, test anxiety, deep and surface learning, self-regulation, ambiguity tolerance, and language achievement.

The reliability estimates of each variable computed via Cronbach's alpha are as follows: task value (α = .85), self-regulation (α = .77), test anxiety (α = .75), surface learning (α = .79), deep learning (α = .82), and ambiguity tolerance (α = .76).

To examine the structural relations, the proposed model was tested using the LISREL 8.50 statistical package. A number of fit indices were examined to evaluate the model fit: the chi-square magnitude which should not be significant, Chi-square/df ratio which should be lower than 2 or 3, the normed fit index (NFI), the good fit index (GFI), and the comparative fit index (CFI) with the cut value greater than .90, and the Root Mean Square Error of Approximation (RMSEA) of about .06 or .07 (Schreiber et al. 2006).

As demonstrated by Fig. 1, the GFI (.90) reached the acceptable fit threshold. The RMSEA (.082) and the chi-square/df ratio (5.23), however, were slightly above those thresholds.

This implies that the model had a moderate fit with the empirical data.

$$\chi2 = 68.25, \quad df = 13, \quad RMSEA = .082, \quad GFI = .90$$

To reach a better model fit, a post-hoc modification was then conducted. In so doing, a path coefficient from ambiguity tolerance to self-regulation and a covariance between deep and surface learning were inserted in the model. This resulted in an overall fit improvement: chi-square = 34.07, the chi-square/df ratio (2.08), RMSEA=. 086, GFI = .95, NFI = .90, CFI = .92. Figure 2 represents the model.

$$\chi2 = 34.07, \quad df = 12, \quad RMSEA = .086, \quad GFI$$
$$= .95, \quad NFI = .90, \quad CFI = .92$$

To check the strengths of the causal relationships among the variables, the t-values and standardized estimates were examined. As indicated in Fig. 1, two estimates were displayed on the paths. The first one is the standardized coefficient (β) which explains the predictive power of the independent variable and presents an easily grasped picture of effect size. The closer the magnitude to 1.0, the higher the correlation and the greater the predictive power of the variable is. The second measure is the t-value (t); if $t > 2$ or $t < -2$, we call the result statistically significant.

The results demonstrated that task value is a positive and significant predictor of ambiguity tolerance (β = .28, t = 2.94) and deep learning (β = .46, t = 6.83). Ambiguity tolerance

Table 1 Descriptive Statistics of Task Value, Self-regulation, Test Anxiety, Deep and Surface Learning, Ambiguity Tolerance, and Language Achievement

	N	Possible range	Minimum	Maximum	Mean	SD
Task value	180	7–42	13.00	42.00	30.7257	6.81585
Self-regulation	180	12–84	20.00	80.00	53.7177	10.3649
Test anxiety	180	5–35	5.00	34.00	19.2881	6.43536
Surface learning	180	4–28	4.00	28.00	19.5723	4.98157
Deep learning	180	6–42	6.00	42.00	28.5246	6.71222
Ambiguity tolerance	180	0–48	5.00	45.00	26.7361	8.15720
Achievement	180	0–20	14.00	19.37	17.0180	1.88288
Valid N (listwise)	180					

($\beta = .32$, $t = 3.59$) and deep learning ($\beta = .59$, $t = 7.43$) in turn influence positively and significantly on self-regulation although the influence of deep learning is greater than that of ambiguity tolerance. Self-regulation exerts a positive and significant impact on language achievement ($\beta = .25$, $t = 3.38$). In a sense, it can be argued that task value indirectly influences self-regulation via its impacts on deep learning; this in turn leads to higher language achievement. Taken together, it appears that task value, ambiguity tolerance, and deep learning act complimentarily leading to higher self-regulation which in turn results in language achievement.

On the other hand, it was revealed that task value and surface learning are not significant predictors of test anxiety. Deep learning, however, was found to be a negative and significant predictor of test anxiety ($\beta = -.25$, $t = -2.71$). A positive and significant association between deep and surface learning was demonstrated in this model ($\beta = .52$, $t = 8.13$).

The correlation coefficients among EFL learners' learners' task value, test anxiety, deep and surface learning, self-regulation, ambiguity tolerance, and language achievement are presented in Table 2. As it can be seen, the highest correlation is observed between deep learning and self-regulation ($r = 0.588$, $p < 0.05$). The second higher correlation was found between task value and self-regulation ($r = 0.542$, $p < 0.05$). It was also found that language achievement correlates positively with task value ($r = 0.339$, $p < 0.05$), deep learning ($r = 0.283$, $p < 0.05$), and ambiguity tolerance ($r = 0.270$, $p < 0.05$). However, it is negatively associated with test anxiety ($r = -0.219$, $p < 0.05$).

Discussion

A major contribution of this study was the empirical assessment of a theoretical-conceptual model combining

Fig. 1 The schematic representation of the relationships among the variables in questions. Note: For ease of presentation, observed variables are not included and only latent variables are presented
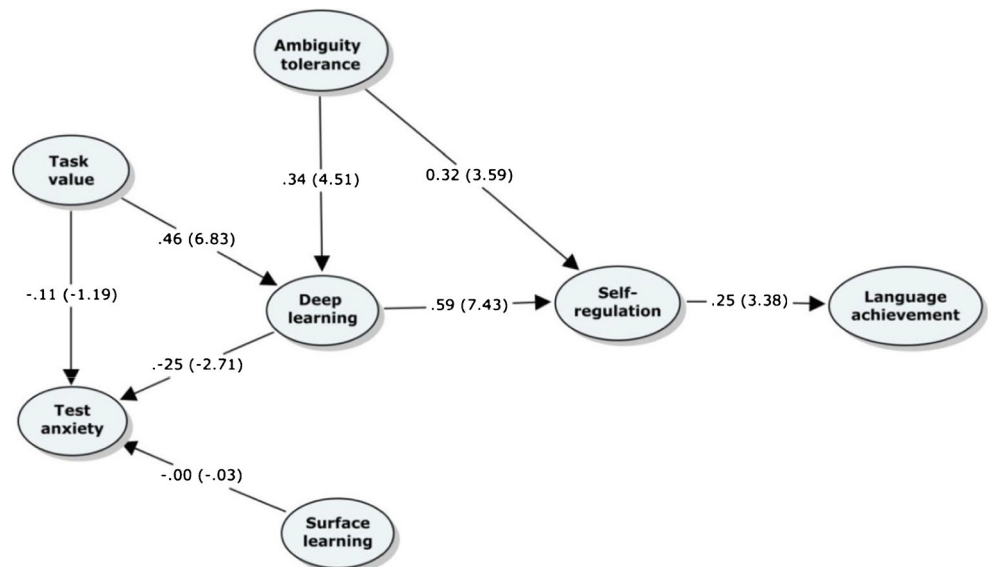
Fig. 2 The final model representing the relationships among the variables in questions. Note: For ease of presentation, observed variables are not included and only latent variables are presented
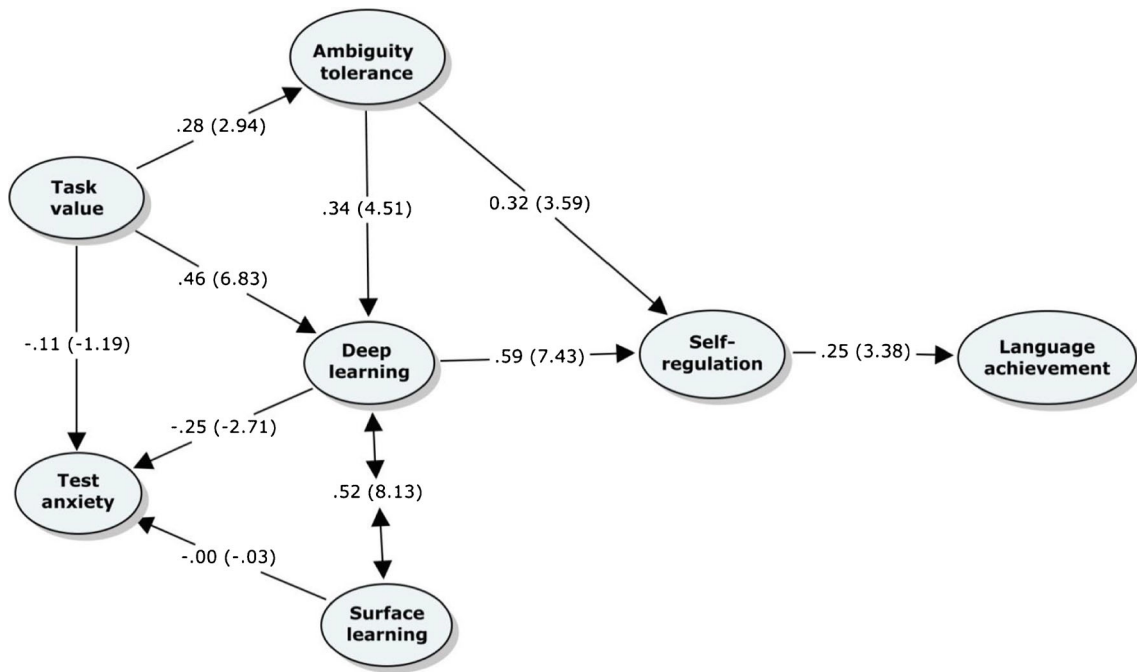
variables derived from the motivational, cognitive, and metacognitive factors. The data analysis yielded the following results. First, the students' metacognitive factors had direct influence on language achievement. Second, a positive and direct relationship between cognitive components and metacognitive components was detected. Third, we also found that the students' motivational components had significant association with cognitive components. Additionally, motivational and cognitive factors indirectly influenced on language achievement. Taken together, these findings corroborate Zimmerman's (1989) contention that the systematic use of metacognitive, motivational, and cognitive strategies is a key feature of the most leading definitions of effective learners.

Relation between deep learning, self- regulation, and language achievement

The first important finding indicated that students' language achievement was directly or indirectly predicted by various individual factors, including, self-regulation, deep learning, task value, and test anxiety. In this study, it was found that learner's cognitive (deep learning) and meta-cognitive (self-regulation)components can have an important influence upon their achievement. In particular, the findings demonstrated that Iranian learner's self-regulation directly predicted their language achievement and learner's deep learning strategies exerted significant effect on self-regulation. This is consistent with the findings of previous research. Pintrich and De Groot (1990) found that students who were motivated to learn the

Table 2 The Correlation Coefficients among Task Value, Self-regulation, Test Anxiety, Deep and Surface Learning, Ambiguity Tolerance, and Language Achievement

	1	2	3	4	5	6	7
1. Task value	1.00						
2. Self-regulation	.542**	1.00					
3. Test anxiety	−.013	.066	1.00				
4. Deep learning	.457**	.588**	−.221**	1.00			
5. Surface learning	.380**	.507**	−.007	.520**	1.00		
6. Ambiguity tolerance	.321**	.460**	−.198**	.349**	.060	1.00	
7. Language achievement	.151	.339**	−.219**	.283**	−.018	.270**	1.00

**Correlation is significant at the level of 005

material (not just get good grades) and believed that their school activities should be organized and well-planned were more cognitively engaged in trying to learn and comprehend the material.

In terms of cognitive learning strategies, deep strategies were identified as important cognitive strategies related to academic achievement (Pintrich and De Groot 1990). These deep strategies include paraphrasing or summarizing the material to be learned, creating analogies, and generative note-taking. In terms of metacognitive process, self-regulated learners plan, set goals, organize, self-monitor, and self-evaluate them during the process of learning (Corno 1986, as cited in Zimmerman 1990). These types of strategies are highly related conceptually (Pintrich et al. 1999) and, accordingly in our data seem to be highly correlated empirically and strongly affected on language achievement. In other words, learners who tend to apply deep strategies in their learning endeavors are more likely self-regulated given that the application of higher-order learning strategies would normally entail higher levels of planning, self-monitoring, and regulating of cognitive activities and strategies. Expectedly these strategies improve learning by helping the learners to use their prior knowledge and connect them with new items and improve their studying behavior and performance. This is in harmony with the findings of a recent study among EFL learners conducted by Ghanizadeh and Mirzaee (2012). In this study, it was found that EFL learners' self-regulatory strategies can predict about 53 % of their language achievement.

Relation between ambiguity tolerance, deep learning, self-regulation, and language achievement

Ambiguity tolerance and deep learning were found to be positive predictors of self-regulation. In comparison to ambiguity tolerance, the learner's deep learning was a stronger predictor. In addition, it was found that self-regulation exerts a positive and significant impact on language achievement. Additionally, ambiguity tolerance demonstrated positive direct impact on deep learning and self-regulation and indirectly on language achievement. In other words, it seems the more tolerant the students were of the ambiguity, the higher their language achievement would be. Identical results have been reported in studies on ESL and EFL learning and the facilitative role of ambiguity tolerance in the process of L2 learning (Chapelle and Roberts 1986; Ghanizadeh and Allahdadi 2015).

Tolerance of ambiguity has also been reported to be an influential factor in the choice of EFL learner's language learning strategies (Jun-yong 1998; Yea-Fen 1995; Ghanizadeh and Allahdadi 2015). When learners do not tolerate their ambiguity reasonably, it can involve them in a

stressful situation which leads to using unproductive learning strategies which in turn inhibits effective language learning.

Taken together, based on this finding, it can be contended that students who are more tolerant of ambiguities are more inclined to use deep strategies to cope with uncertainties. They are also more liable to use self-regulatory strategies in order to control and structure their cognitive activities thereby manage unfamiliar and ambiguous circumstances.

Relation between task value, deep learning, and language achievement

Task value refers to the learner's perceptions of the course material in terms of interest, importance, usefulness, and utility (Pintrich and De Groot 1990). The results showed that that task value is a positive and significant predictor of deep learning. It seems evident that students with high task value, self-regulation and ambiguity tolerance are more inclined to use deep learning strategies leading to high language achievement (Pintrich and De Groot 1990). Additionally, it was also found that task value indirectly influences self-regulation via its impacts on deep learning; this in turn leads to higher language achievement. When learners are aware of the importance and the value of a task, they do it with interest and try to choose appropriate learning strategies, such as: paraphrasing or organizing items in order to achieve academic gains.

Relation between task value and ambiguity tolerance

The statistical analyses of the present study indicated significant relation between task value and ambiguity tolerance. It is plausible to contend learners who are more interested in the course materials and see the classroom tasks relevant and applicable are more prepared to tolerate uncertainties in the course materials and try to resolve ambiguities. And expectedly, learners who display higher interest in their classes are more apt at attaining interpersonal competence (Ghanizadeh and Jahedizadeh 2015) which entails embracing challenge and ambiguity with more ease and eagerness.

Relation between deep learning, test anxiety, and language achievement

Test anxiety is basically a strong emotional reaction that an individual experiences before and during an examination (Akca 2011). Therefore, it has a significant role in learner's emotional life and academic achievements. In this study, our findings indicated that test anxiety as a motivational component has a negative relation with deep learning. Plethora of research found that test anxiety exerts copious negative effects on academic achievement, motivation, self-evaluation beliefs, and concentration, as well as an increase in school dropout rates and general anxiety (Hancock 2001; Whitaker Sena et al.

2007, as cited in Asghari et al. 2012); In other words, the effect of test anxiety on learner's motivation might minimize their understanding and performance on the task and also their success in learning a language and these lead to wrong adoption of learning strategies. Consequently, higher test anxiety might minimize the language achievement and relegate significant learning outcomes protectively (Bembenutty 2008).

Pedagogical implications

The findings of this study put forward pedagogical implications for empowering EFL learners to learn effectively based on individuals' motivational, cognitive, and meta-cognitive components and their effect on language achievement. Both language learners and teachers need to identify these individual differences. They should consider this idea that cognitive learning strategies are in a linear association with self-regulatory strategies use and language achievement and also indirectly contribute to students' motivational disposition. This implies that informing learners about different motivational, cognitive, and meta-cognitive strategies appear to be effective for improving actual language achievement. Consistent with our hypothesis and Pintrich and De Groot's findings (1990), we found that self-regulation was highly correlated with cognitive strategy use and expectedly the best predictor of a language achievement. This suggests that the use of cognitive and self-regulation strategies are essential for academic performance on different types of tasks (Corno 1986; Zimmerman and Pons 1986, 1988; Ghanizadeh and Mirzaee 2012). Accordingly, the results suggest that it is important for teachers to be aware of their students' perceptions of the importance of tasks and activities in order to obtain better academic achievement. In line with our findings, Boekaerts (1997) recommended that teachers should be well trained to create and design effective situations in their classrooms in which learners can improve their planning, organizational and metacognitive abilities. Additionally, language teachers should make endeavors to reduce uncertainty and ambiguity of tasks by setting out clear rules about their expectations in order to help learners to overcome their anxiety that leads to the employment of effective and higher-order learning strategies.

In sum, the results suggested valid empirical evidence for the importance of considering motivational, cognitive, and self-regulatory components in our models of teaching in order to boost language achievement. Additionally, consideration of these findings may not only increase teachers' awareness of their learner's' learning strategies but also benefit them in designing appropriate and effective course materials and classroom activities.

The present study was limited in a number of ways. First, due to feasibility consideration, the participants were chosen according to a convenience sampling. Second, the participants

of the study comprised EFL learners studying in two universities of Iran. So, future research should include students from other universities to increase the generalizability of the findings. Third, in this research, the variables in question were measured only via questionnaires and the researcher did not use qualitative approach such as interview or case study.

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