



# The Relationship between Personality Types and Self-Regulated Learning Strategies of Language Learners

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## Abstract

This study investigates the relationship between personality traits, as measured by the NEO Five Factor Inventory, and different learning strategies, measured by the Motivated Strategies for Learning Questionnaire (MSLQ), that foreign language student may employ to help them learn the language. A sample of 231 undergraduate students of English in Iran was administered the Inventory and the MSLQ. This study is the first to connect learners' personality traits with general learning strategies, which can be specifically applied to foreign language learning. Analyzing the data using multiple regressions, the authors found that personality type was able to predict the tendency to use different learning strategies. Specifically, students who scored high on "conscientiousness" were more likely to use all strategies, particularly managing time and study environment. Students high on extraversion were more likely to use peer learning and help seeking strategies. The authors conclude that language teachers could benefit from assessing their students' personalities and matching strategies to their students' tendencies.

**Keywords:** Self-regulation; Personality; Five-Factor Inventory; Second language learning

## 1. Introduction

During the past decades, an issue that has been under scrutiny in both schools and academic settings is learners' use of different strategies in order to enhance their learning and being actively involved in reorganizing and reconstructing their existing knowledge with new knowledge. Promoting self-regulated learning among learners and letting them take responsibility of their own learning by taking advantage of self-regulated strategies is a key factor in making strategic learners and autonomous individuals both in learning situations and later in life. Self-regulation, as the name implies, is the process of managing and regulating one's own behavior, actions, and thoughts which is one of the important elements for initiating and maintaining long life learning. It has gained prominence in psychological studies since 1990s, and in recent years has also been applied to educational settings involving both schools and universities. Individual ability to self-regulate their learning is shaped by a number of factors one of which is learners' personality traits. According to Hoyle (2010), personality traits affects people's self-regulation and the routine success or failure they experience. When talking about personality, we mean why a person behaves in a particular way. A very abstract concept, personality has always been one of the main concerns of psychologists in classifying people based on their behavior. It is the most important way in which individuals differ in their enduring emotional, interpersonal, experiential, attitudinal, and motivational styles and is influenced by relatively stable characteristics (McCrae & John, 1991). In educational setting, the determining influence of personality traits on learning process cannot be taken for granted, though it has been disregarded for a long time. Not only are learners affected by their cognitive abilities like intelligence, they also act differently toward the process of learning since they behave differently in learning. However, measuring personality traits and putting them into different categories have always been considered an important task for psychologists. It is a difficult task to determine the exact number of factors based on which personality can be measured, so determining the personality of individuals has been a daunting task over the years and many models and measuring instruments have been proposed. One of the most common models is that proposed by Costa and McCrae in 1986 and it is known as Five Factor model. The model has undergone many modifications and nowadays it is used in most of the studies which are concerned with personality traits.

This study tried to investigate the relationship between learners' personality traits and their use of self-regulated learning strategies. What has made the study more important and different is that this relationship is investigated among foreign language learners. In case of learning another language, personality has been investigated just in realms of ability and motivation (Boekaerts, 1996). Also, Studies in the self-regulated learning literature have indicated that various components of the self-regulated learning are associated with academic achievement (Bidjerano, T. & Dai, D. Y., 2007). Hence, the employment of language learning strategies, which might have subtle differences compared to strategies used for other subjects, help students gain high level of language proficiency. In the present study we have focused on language students and have tried to establish connection between their way of behavior and their helpful techniques while learning a foreign language.

### 1.1 Self-regulated Learning

Self-regulated learning is "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment" (Pintrich, 2000, p. 453). When students generate their own thoughts, feelings, strategies, and behaviors and orient them toward the achievement of the specified goals, these self-generated thoughts and strategies refer to self-regulated learning (Schunk & Zimmerman, 1998). According to Paris & Winograd (2003), self-regulated learning is characterized by awareness of *thinking*, *use of strategies*, and *sustained motivation*. Awareness of thinking or metacognitive awareness refers to thinking about thinking or learners' automatic awareness of their own knowledge. Use of strategies is learners' applying different kinds of strategies during learning, for example strategies for controlling emotions and for pursuing goals. Sustained motivation is individuals' consideration of the goal of the learning activity, reflection on their own competence needed to carry out the task, and probable advantages or disadvantages resulted from task success or failure.

Considering the different models of self-regulated strategies, from the 1970s the cognitive areas were mostly under investigation. In the 1980s, researchers started the experimental implementation of differing strategy conditions, including more and more metacognitive aspects of learning (Paris & Paris, 2001). Today the emphasis on motivational and volitional components is undertaken in recent models of self-regulated strategies (Boekaerts & Corno, 2005). One of the known models is Bandura's social cognitive theory where self regulation is a multifaceted phenomenon operating through a number of subsidiary cognitive processes including self monitoring, standard setting, evaluative judgment, self appraisal, and affective self-reaction (Dienstbier, 1991). Boekaerts (2002) criticizes current theories of self regulation for being not well focused, incomplete and harbor misconception. Her main message is that students bring their own goals to the classroom and that these goals are the key to their adaptation system. Personal goals give meaning and organization, and purpose to a student's adaptation processes in the classroom (Boekaerts, 2002). A well-known model of self regulation was proposed by Zimmerman in 2000 including three phases of forethought, performance, and self-reflection. When learners set goals or activate their prior knowledge or make plans before their learning, it is the forethought phase of learning. Performance phase is concerned with monitoring one's actions and their outcomes and attempting to control one's cognitions, motivation, behaviors, and contextual factors during learning. The last phase, self-reflection, incorporates assessment of one's overall performance (Anthony, 2008).

Self-regulated learning for school children, either taught or already present, proves to be effective (Perry, VandeKamp, Mercer, & Nordby, 2002). Zimmerman (1998) believes that "Providing students with knowledge and skills about how to self-regulate their learning can guide them to self-initiate motivational, behavioral, and metacognitive activities in order to control their learning". In academic setting, those who show good work habits are self regulated strategic individuals who are found to enjoy productive engagement in academic tasks and their efforts are recognized in the classroom learning community (Randi, 2009).

### 1.2 The big five personality factors

The five factors of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness comprise the Five Factor Model (FFM) which is a data-driven research finding claimed to represent the personalities of the individuals. The FFM model was first identified by analysis of lists of trait terms derived from English language dictionaries, and also conducting psycho lexical studies in different languages (McCrae & Costa, 1997). Today the consensus is that the Five-Factor Model (FFM) of personality, which was developed from two traditions of lexical and theoretical approaches, is essentially correct in its representation of the structure of traits not just in educational setting but in every context and in its implications for personality theory and its applications throughout psychology (McCrae and John, 1991). The following is a brief explanation of five factors of the model:

*Extraversion*: It characterizes those individuals who are active, sociable, assertive, energetic, enthusiastic, outgoing, talkative, and have positive affect. Extraverts seek out stimulation and the company of others and engagement with the external world. Those with low extraversion tend to be reserved and quiet.

*Agreeableness*: Individuals who are forgiving, not critical or skeptical, considerate, kind, compassionate and trustful can be considered having agreeable behavior. As Goldberg (1990) puts it "individuals' courteous, trusting, and cooperative behaviors are signified as agreeableness". Agreeable people also have an optimistic view of human nature and they believe people are basically honest, decent, and trustworthy.

*Conscientiousness*: Individuals having this feature are efficient, consistent, organized, methodical, planned, neat, and reliable. They show self-discipline, act dutifully, and aim for achievement. They tend to set clear goals to direct their efforts and to exert greater effort than less conscientious people (Mount & Barrick, 1995).

*Neuroticism*: People high in neuroticism always feel inferior, worthless, helpless, tense, and anxious. It is a tendency to get nervous easily and feel vulnerable. This category is also referred to as emotional stability that is in opposite with neuroticism because those who score high on emotional stability are characterized as being self-confident and relaxed.

*Openness*: Features of openness (also called intellect) are aesthetic sensitivity, awareness of one's emotions, vivid imagination, preference for novelty and variety and intellectual curiosity. (Costa & McCrae, 1992; McCrae & Costa, 1997). People high in openness show interest in aesthetic, unconventional and intellectual behaviors.

By administering special questionnaires or running interviews, the tendency of the person toward one of the extremes of the each continuum is relatively determined. It should be noted that individuals general behavior may be changed in dealing with some specific tasks or in some situations, so the reported personality type is not something always the same.

### *1.3 Big five and self-regulated learning*

In learning and educational settings the big five factors are relevant and they are influential in determining the type of self-regulated strategies that learners try to make use of during learning. The five factor model has the prediction ability; it not only can predict the types of strategies that a person is likely to engage in but also the success of these strategies in modifying behavioral outcomes (McCrae & Löckenhoff, 2010).

Discussing on the relationship between personality traits and self-regulation, McCrae & Löckenhoff (2010) indicated that self control, which self-regulation stems from it, is primarily related to low neuroticism and high conscientiousness.

Conscientious individuals use their time more efficiently, they report time management and effort regulation (Bidjerano & Dai, 2007), schedule in the context of exercise adherence (Courneya & Hellsten, 1998), set high standards for their learning (Little et al., 1992), and prefer methodic and analytic learning. According to Costa and Piedmont (2003), Individuals high in conscientiousness have "a clear sense of their own goals and the ability to work toward them even under unfavorable conditions". On the contrary, those low in conscientiousness "see little need to exert rigorous control over their behavior"(p.157).

Individuals high in openness are more reflective due to their epistemic motives, and more accurate in assessing their own performance (Trapnell & Campbell, 1999). They are likely to employ time and environment management strategies (McCrae & Löckenhoff, 2010) and prefer spontaneous exercise (Courneya & Hellsten, 1998). Openness is found to be related to deep and elaborative learning, constructive approach, and meaning-directed learning (Busato, Prins, Elshout, & Hamaker, 1999).

Agreeable individuals focus on cooperative achievement (Ross, Rausch, & Canada, 2003) and set challenging goals for themselves (Judge & Ilies, 2002). Agreeableness is correlated with reproductive learning (Vermetten, Lodewijks, & Vermunt, 2001 ) and the association of agreeableness with compliance and cooperativeness makes agreeable individuals regulate their time and effort learning context (Bidjerano & Dai, 2007).

Extraverts show some kind of conscientiousness in their projects by being more meaningfully involved and efficient and they show a tendency toward interpersonal rather than personal academic projects (Little et al., 1992), and like agreeable individuals, extraverts prefer to work in cooperative settings (Ross et al., 2003). Individuals high in extraversion respond more to positive imagery (McCrae & Löckenhoff, 2010) and are more active in peer learning in academic contexts (Bidjerano & Dai, 2007). They are also found to be poorer in reflective problem solving because of their tendency to reach cognitive closure by exiting the problem in an impulsive manner (Matthews, 1997). So, it is not acceptable to assume that extraverts are successful in all academic tasks because of their tendency to help seeking, peer learning, and cooperative work, rather they may fail in some tasks that need some reflection and individuality.

It can be stated that in learning situation individuals high in neuroticism will not be as successful as those low in neuroticism since they lack critical thinking, they may fail in tasks that need some kind of analyzing, and do not set challenging goals for themselves (Judge & Ilies, 2002; Bidjerano & Dai, 2007).

For every project, neurotic people see themselves involved in a stressful and meaningless situation and do not feel to have enough ability for their progress (Little et al., 1992). They ruminate a lot over their failures in exams, and worry too much about the upcoming exam, they are likely to have a surface approach to learning and just focus on memorizing and superficial features of the studied material instead of achieving deeper, meaningful understanding of it (Entwistle, 1988). Generally speaking, individuals high in neuroticism may find it difficult to self regulate so they rarely use any of these strategies since they are not productive learners (Slaats, Van der Sanden, & Lodewijks, 1997).

### *1.4 Self-regulated Learning Strategies in Second Language Context*

Language learning strategies are found to be effective in learners' self-directed involvement and in improving their communicative competence, language proficiency, and self-confidence (Oxford, 1990). Investigating self-regulated strategies has been recently proposed as an alternative quantifying scale for language learning strategies. Wen-Ta Tseng et al. (2006) working on a new approach to assessing strategic learning on the realm of vocabulary learning approved the validity of transferring the theoretical construct of self-regulation from educational psychology to the area of second language acquisition. They proposed that self-regulation is a more psychometrically reliable measure of strategic learning than traditional language learning strategy scales. Huang (2008) found the applicability of MSLQ, as the major instrument in assessing self-regulated learning strategies, in second language settings "because classroom L2 learning has all the attributes of other school subjects, and yet it has an inherent and unique social dimension which does not apply to other content areas"(Huang, 2008).

Nakata (2010) believes that in order for self-regulation to happen in foreign-language learning, teachers need to consider learners' background which include language-learning history, language proficiency, attitudes toward language-learning, preferred learning styles and strategies, every factor which may impede learners' progress and motivation, and the gap between their background and the teacher background as a language-learner and a language teacher.

All the aforementioned studies argue for the efficacy of self-regulatory measuring tools in language learning contexts and also, as mentioned before, personality type of the learners is a determining factor in learners' use of self-regulated strategies. There is scarcity of research on the probable relationship of self-regulated learning strategies and personality traits of language learners. Therefore, this study aimed to examine this issue by proposing two research questions:

1. What are the types and frequency of self-regulated learning strategies preferred by university EFL learners based on the data collected through Motivated Strategies for Learning Questionnaire (MSLQ)?
2. How are the self-regulated strategies of the learners related to their personality types?

## 2. Method

### 2.1 Participants

The participants of the study consisted of a sample of 231 undergraduate students all studying English across the universities of Iran. They were all Persian native speakers of whom 41.1 percent were male and 58.9 female. The participants age range was between 19 to 38, and they majored in Translation, English literature, and Teaching English as a Second/Foreign Language. All the participants were members of an academic community database which facilitates access to academic sources and offers job opportunities along with some other advantages. Among numerous students who were members of the website, we randomly selected those undergraduate English language learners who were qualified to answer study questions. No specific university was considered as the target sample and those selected are representatives of all university students in Iran.

### 2.2 Instrumentation

In order to collect data about the personality and self-regulatory strategies of the students, two questionnaires were administered along with some demographic questions about their sex, age and major.

#### 2.2.1 NEO Five Factor Inventory

The NEO Five Factor Inventory is a 60-item, self report questionnaire scored on a five likert scale in which every 12 item tests one of the content areas of Five Factor model. It was modified and shortened from the earlier versions (Goldberg, 1981) in 1992 by Costa and McCrae. It is regarded one of the most valid inventories measuring personality traits that can be profitably used in most applied settings (Tupes and Christal, 1961). It can be used for industrial and organizational psychology, clinical psychology, counseling, health psychology, forensic, and education. The internal consistency of NEO-FFI ranges from 0.68 to 0.86. Our 60-item questionnaire was pilot tested, also we calculated the Cronbach's alpha for the questionnaire and it was 0.88 which proves the reliability of the instrument to conduct the study.

#### 2.2.2 Motivated Strategies for Learning Questionnaire (MSLQ)

Self-regulatory strategies of the learners were assessed by Motivated Strategies for Learning Questionnaire. Both the college version (Pintrich et al., 1993) and the junior high school version (Pintrich & De Groot, 1990) of MSLQ have been used in different languages, in different countries, and on diverse samples and settings to address both theoretical and applied purposes. The questionnaire consists of 81 items designed to capture two broad dimensions of self-regulation: motivation, consisting six subscales, and learning strategies which consists of nine subscales. Since the focus of the study is on cognitive, metacognitive, and resource management strategies, only the self-regulation part of the questionnaire was used which contains 47 items testing these subcategories: Cognitive and Metacognitive strategies that include Rehearsal, Elaboration, Organization, Critical Thinking, and Self-Regulation. Resource Management Strategies that include Time and Study Environment, Effort Regulation, Peer Learning, and Help Seeking. The subjects were required to select one of the options from a seven-likert scale ranging from 1(not at all true of me) to 7(very true of me). Paul Pintrich (1993) and some other researchers examined the reliability and validity of the instrument and proved its reliability acceptable. The general framework and its measurement scales seem to be valid and the sub-components displayed predictive validity. The internal consistency reliability of subscales are as follows:

Subscale	Cronbach $\alpha$
Cognitive	0.83
Metacognitive	0.80
Resource Management Strategies	0.91

### 2.3 Procedure

The questionnaires were pilot tested by being administered to fifteen students with characteristics judged to be similar to those in the target sample. They were also asked to read the questions critically and make comments. The participants of the study were selected among members of an academic community database. An informative email was sent to

those who were undergraduate EFL learners and were told about the study. If they were willing to participate, the questionnaires would be sent to them by email and their probable questions were also answered on-line. About 10 percent of the emails were replied back. Participants were also asked to answer the questionnaire of MSLQ based on their strategies in language classes. Data were transferred to SPSS version 17 and analyzed.

### 3. Results

The first research question is related to the type and frequency of self-regulated strategies among the sample group. Table 1 shows the descriptive statistics of data based on MSLQ. It can be found that the most frequent self-regulated strategy used among Iranian EFL learners is organization strategy with mean of 5 based upon a scale of 1-7. It is followed by elaboration strategy, rehearsal, self-regulation, critical thinking, effort regulation, time and study environment, help seeking, and finally peer learning.

Table 1. Descriptive statistics of self-regulated strategies

Self-regulated Strategy	Total Number	Mean	Standard Deviation
Rehearsal	230	4.5402	1.43196
Elaboration	229	4.9614	1.32072
Organization	231	5.0422	1.45188
Critical thinking	230	4.4453	1.33916
Self-regulation	231	4.4935	.92573
Time and study	231	4.3203	1.07046
Effort Regulation	231	4.3654	1.20048
Peer learning	231	3.8665	1.53780
Help seeking	230	4.2957	1.42420

In order to find the relationship between personality traits and each of self-regulated learning strategies, a multiple regression analysis was carried out in which the big five personality traits were regarded as predictors (independent) and each self-regulated learning strategy (dependent) as the criterion. The results of one-way ANOVA showed a significant relationship between every criterion and predictors at  $P = .000 < .01$ . It means all individuals with any personality type apply at least one of the strategies during their language learning process. Although the existence of a significant relationship between personality traits and self-regulated learning strategies as a whole was proved, the researchers used the standardized beta coefficients to give a measure of the contribution of each variable to the model. The beta value, which is computed in units of standard deviation, is a measure of how strongly each predictor variable influences the criterion variable. A large value indicates that a unique change in this predictor variable has a large effect on the dependent variable. For example, a beta value of 0.296 indicates that a change of one standard deviation in the personality traits will result in a change of 0.296 standard deviations in self-regulated strategies. Thus, the higher the beta value, the greater the impact of the predictor variables on the criterion variable. The next part of the results is devoted to a number of regression analyses in which the nine sub-categories self-regulated strategies are dependent variables and five personality traits are independent variables. To save space, some of the tables are presented in appendix.

Table 2 shows the coefficient values of rehearsal strategy displaying that it has a significant relationship with neuroticism and conscientiousness with beta value of conscientiousness much stronger than neuroticism, that is, one standard deviation change in conscientiousness will result in .49 increasing in rehearsal strategy.

Table 2. coefficient values of rehearsal strategy

Predictors	B	Std. Error	Beta		Sig.
neuroticism	.393	.184	.186	2.142	.033*
extraversion	.161	.244	.047	.662	.509
openness	-.204	.226	-.057	-.904	.367
agreeableness	.152	.265	.042	.574	.566
conscientiousness	1.245	.204	.469	6.100	.000*

Table 3 shows that elaboration strategy as a self-regulatory strategy is significantly related to three predictors, extraversion (sig.= .01) openness (sig.=.00), and conscientiousness (sig.=.00). ( $P < .05$ )

Table 3. coefficient values of elaboration strategy

Predictors	B	Std. Error	Beta		Sig.
neuroticism	-.188	.158	-.097	-1.187	.237
extraversion	.504	.213	.158	2.365	.019*
openness	.671	.198	.200	3.384	.001*
agreeableness	-.156	.230	-.046	-.677	.499
conscientiousness	.793	.178	.324	4.460	.000*

Organization and self-regulation as the other self-regulated strategies are related to the conscientiousness personality trait at the .05 level of significance with beta value of .47 and .40 and critical thinking is related to conscientiousness and openness with beta values of .28 and .27 that are not so strong (see Appendix).

Table 4 shows the coefficient values of time and study environment as self-regulatory strategies. It can be found from the table that this strategy is positively related to conscientiousness and negatively related to openness.

Table 4. coefficient values of time and study environment strategies

Predictors	B	Std. Error	Beta		Sig.
neuroticism	-.067	.119	-.043	-.567	.571
extraversion	-.037	.157	-.014	-.234	.815
openness	-.447	.147	-.166	-3.049	.003*
agreeableness	-.092	.173	-.034	-.536	.593
conscientiousness	1.162	.132	.587	8.790	.000*

Effort is positively related to conscientiousness but negatively related to neuroticism with a moderate beta value for both of them (.27 and -.21). (Table 5)

The other two self-regulatory strategies, peer learning and help seeking, that are social strategies as expected are related to and extraversion and help seeking is related to conscientiousness too (Tables 5 and 6).

Table 5- coefficient values of peer learning strategy

Predictors	B	Std. Error	Beta		Sig.
neuroticism	-.008	.202	-.004	-.040	.968
extraversion	1.048	.268	.285	3.915	.000*
openness	.218	.249	.056	.874	.383
agreeableness	-.400	.293	-.102	-1.364	.174
conscientiousness	.334	.225	.117	1.485	.139

Table 6. coefficient values of help seeking strategy

Predictors	B	Std. Error	Beta		Sig.
neuroticism	-.056	.189	-.027	-.298	.766
extraversion	.496	.250	.145	1.982	.049*
openness	.042	.232	.012	.182	.855
agreeableness	.081	.273	.022	.297	.766
conscientiousness	.589	.210	.223	2.806	.005*

#### 4. Discussion & Conclusion

The purpose of this study was investigating the relationship between the self-regulated learning strategies of language learners and their personality traits. A regression analysis was carried out to find this relationship and results indicated that individuals high in conscientiousness use all the strategies during their language learning process especially time and study management. Bidjerano & Dai (2007) also found similar results and they added that this finding was quite predictable since conscientious students are so likely to have a designated place for studying or choose a study place where they could be more focused and to manage their study time appropriately for their language learning studies. Chamorro-Premuzic and Furnham (2003) expected the establishment of a connection between conscientiousness and strategic learning because conscientious individuals show high degrees of self-discipline, deliberation, hard-working attitude, order, dutifulness, compliance, and imperturbability. On the contrary to conscientious individuals, those high in neuroticism are not so much strategy users. They have just reported using rehearsal which cannot guarantee learners success alone. This, in our view, is the result of lack of self-confidence because neurotic people do not straightforwardly trust their abilities, so they have many rehearsals to learn the subject matter. The use of this strategy can not be interpreted as a self-regulated strategy rather it is the outcome of worrying about not learning the subject matter properly that stems from the general trait of the learner. Entwistle et al. (2000) mention that individuals high in neuroticism are surface learners and their “fear of failure” displayed by pessimism and anxiety about academic outcomes prevent them from being strategic. The significant relationship between elaboration and critical thinking on the one hand and openness on the other are in line with the study of Bidjerano and Dai (2007). They mentioned that students’ tendency for evaluating information critically and thinking about their own thinking while performing a task is partially explained by habitual ways of acquiring and processing information. Finally, as was expected, sociable individuals who are determined by their high scores in extraversion personality, use help seeking and peer learning strategies because of their assertive and sociable features.

Our findings provide some support to the hypothesis that approaches to learning have a foundation in personality. The results shed light on the importance of psychological variables in language classrooms and show that applying appropriate strategies in language learning is not just a matter of learning context or language teaching method; rather, it depends on the personality traits of the learners and many other variables that may not be directly observable. Language teachers are recommended to introduce all of the learning strategies to all of the students; then perhaps encourage students of different personality types to expand their repertoire of strategies by emphasizing strategies the least antithetical to a certain student’s personality. The strong link between personality traits and strategies lies in Strategies-based instruction (SBI) (McDonough, 1999; Cohen, 1998) that is implemented in language classrooms through three steps (Brown, 2007), the first step of which is identifying learners’ styles or personalities and strategies. So educators can make use of the present study findings to implement SBI in their classrooms. Strategy-based instruction programs are not expected to be effective when learners’ characteristics are marginalized or completely ignored. As long as teachers are aware of learners’ individual differences, can they judge the effectiveness of their introduced strategy and systematically provide the needed instructional varieties.

Data of this study were accumulated via questionnaires. Although the two questionnaires used are two of the most widely used ones throughout the world, the validity of data accumulated by questionnaires are always under question because they cannot provide exact information about underlying characteristics of the learners. Interviews or other more qualitative instruments can validate the results of the questionnaires by providing the opportunity for the participants to state their opinion about their learning rather than being limited to a set of prepared questions. This study was carried out amongst university language students, yet other academic subjects and also the school students can be good areas for investigating this relationship.

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## Appendix

### Coefficients

Table 8. Coefficient values of critical thinking strategy

Predictors	B	Std. Error	Beta		Sig.
neuroticism	.012	.173	.006	.071	.943
extraversion	.056	.230	.017	.245	.807
openness	.910	.213	.270	4.270	.000*
agreeableness	-.061	.250	-.018	-.244	.808
conscientiousness	.700	.192	.282	3.636	.000*

Table 9. Coefficient values of self regulation strategy

	B	Std. Error	Beta		
neuroticism	.136	.118	.099	1.153	.250
extraversion	.263	.156	.119	1.686	.093
openness	.039	.146	.017	.265	.791
agreeableness	-.005	.171	-.002	-.030	.976
conscientiousness	.699	.131	.408	5.325	.000*