

## **Learning Styles as Predictors of Students' Test Performance**

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### **Abstract**

Raising awareness of learning styles as a major component of communicative competence in learners may lead to greater levels of success in English as a foreign language. This study was an attempt to investigate the role of learning styles as predictors of test performance. The participants of the study were 152 B.A. level students majoring in English teaching at Imam Khomeini international university in Qazvin and Takestan Islamic Azad University. To get ensured of the homogeneity of the participants prior to the study, the researchers administered a test of general language proficiency which showed no significant differences among the participants in this regard. Then, the learning styles questionnaire adapted from Honey and Mumford (2000) was administered to the participants. At the end of the semester, the participants took part in their usual final exams. The obtained data were analyzed using multiple regression analysis. The results revealed that out of the four learning styles of theorist, activist, reflective, and pragmatist as possible predictors, only reflective and pragmatist styles accounted for a statistically significant portion of the variance in final test performance. The findings of this study may have theoretical and pedagogical implications for language learners, teachers, and syllabus designers.

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## **1. Introduction**

According to Nunan (2003), learning styles are learners' preferred ways of perceiving and processing information stemming from the learners themselves. Learning styles are considered as the ways through which learners can perceive and process information that stem from the tasks as these styles are important in accomplishing tasks.

The present study aims at examining the role of learning styles in foreign language learning. Ehrman (1994) postulates that wherever learning styles and teaching styles do not match, learning problems will arise. Therefore, studying the role and function of learning styles in the development of EFL can help learners improve their foreign language performance. Also, raising awareness of styles as being a major component of communicative competence in learners will surely lead to the greater success in language learning. Macaro (2001) believes that development of learning styles results in being a successful learner. In other words, a good helpful way to accelerate learning is making learners familiar with ways of learning efficiently. Reid (1995) argues in case EFL learners develop a good perception about styles of learning they are more likely to increase their learning capacity and control their own learning process. Hence, the present study tries to answer the following question in order to investigate the predictive role learning styles can play in the learners' performance on an achievement test.

- To what extent are different learning styles (theorist, activist, reflector, and pragmatist) predictors of test performance?

## **2. Literature Review**

Individual learning a foreign language approach their goal of learning through different paths, something the educationalists and psychologists consider as different styles of learning. Learning style could be defined as any cognitive, affective, and psychological behaviors which indicate how different language learners might perceive the learning environment around and successfully interact with social milieu of that language (Keefe, 1979).

Claxton and Ralston (1978) refer to styles as consistent way in which learners respond to and use stimuli in the context of learning.

According to Oxford (2001), learning style could refer to the general assumption and approach learners prefer while learning something, acquiring a language, or dealing with a difficult problem. It is an overall pattern that directs learning and makes one instructional method liked by some students and disliked by others. Skehan's (1991, P.288) definition is "learning style is a general predisposition, voluntary or not, toward processing information in a particular way".

### *2.1. Learning Styles Classification*

Various classifications have been offered for learning styles. Nunan (2003) has offered the following taxonomy:

Ehrman and Leaver (2003, p. 400) have identified nine different styles as follows:

1. Field independence-dependence
2. Random (non-linear) vs. sequential (linear)
3. Global vs. particular
4. Inductive vs. particular
5. Synthetic vs. analytic
6. Analogue vs. digital
7. Concrete vs. abstract
8. Leveling vs. sharpening
9. Impulsive vs. reflective

Kolb and Kolb (2005) introduced four patterns as characteristic approaches associated with learning styles: diverging, assimilating, converging, and accommodating. These four patterns are the defined learning styles in Kolb's Learning Style Inventory. Since Kolb's Learning Style Inventory (LSI) had some technical and psychometric problems (Freedman & Stumpf, 1978) and its construct and face validity was questioned (Wilson, 1986) Honey and Mumford (1986) developed another learning style survey. Honey and Mumford (1986), in this regard, identified four basic learning styles of activists, reflectors, theorists, and pragmatists. Table 2 below shows the descriptive terms associated with each category.

Activists are eager to learn new materials, to involve in activities and like problem solving. Reflectors enjoy gathering and assimilating information from several different sources. They do not act before they are ready. Reflectors need a lot of information to decide upon and then.

Table 1  
*Learning Style Taxonomy Adopted from Nunan (2003, pp. 271-272)*  
*Learning style taxonomy for the L2 classroom*

<i>Type1: Cognitive Styles</i>	<i>Type2: Sensory Styles</i>	<i>Type3: Personality Styles</i>
Field Dependent- learns best when information is presented in context. They are often more fluent language learners.	Perceptual: Visual- learns best when there is visual reinforcement such as charts, pictures, graphs, ect. Auditory- learns more effectively by listening to information	Tolerance of Ambiguity: Refers to how comfortable a learner is with uncertainty; some students do well in situations where there are several possible answers; others prefer one correct answer.
Field independent- learn most effectively step-by-step and with sequential instruction. They are often more accurate language learners.	Tactile- learns more effectively when there is an opportunity to use manipulative resources. Kinesthetic- learns more effectively when there is movement associated with learning.	
Analytic- works more effectively alone and at his/her own pace Global- works more effectively in groups.	Environmental: Physical- sensitive to learning environment, such as light, temperature, furniture. Sociological- sensitive to relationship within the learning environment.	Right and Left Hemisphere Dominance Left brain dominant learners tend to be more visual, analytical, reflective, and self-reliant. Right-brain dominant learners tend to be more auditory, global, impulsive, and interactive.
Reflective- learns more effectively when they have time to consider new information before responding Impulsive- learns more effectively when they can respond to new information immediately, as language learners, they		

are risk takers

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They need some time and interval to reflect on the information received appropriately.

Table 2

*The learning styles of Honey and Mumford adapted from Honey and Mumford (2000, p.36)*

<i>Activist</i>	<i>Pragmatist</i>
<ul style="list-style-type: none"><li>• Suited to experiential rather than lectures</li><li>• Not keen on implementation</li></ul>	<ul style="list-style-type: none"><li>• Favors independence</li><li>• Could undertake more research</li></ul>
<i>Reflector</i>	<i>Theorist</i>
<ul style="list-style-type: none"><li>• Conscientious but hard to get started</li><li>• Assimilates information</li></ul>	<ul style="list-style-type: none"><li>• Much time spent working it out</li><li>• Much redrafting</li><li>• Detailed investigators</li></ul>

Theorists try to explain ideas and concepts and try to develop their own specific models, theories, and perceptions based on their own observations and experiences. Pragmatists are interested in learning techniques, practicing and experimentation and try to solve real world problems. According to Honey and Mumford (1986), both of these groups of learners (theorists and activists) are interested in challenges with the environment, but pragmatists and reflectors prefer safety. The learners labelled as pragmatists would like to be advised about what they are expected to do. They also need to find the appropriate time and opportunity to put into application what they are told to. Reid (1995, p.12) considered the following style performances useful in understanding language learning process:

- Being visual, auditory or hands-on
- Being more extroverted versus introverted
- Being more abstract and intuitive versus more concrete and thinking in step-by-step sequence
- Preferring to keep all options open versus being closure-oriented

- Being more global versus more particular
- Being more synthesizing versus being more analytic

*2.2. Learning Styles and Language Learning Studies*

Good language learners know how to adapt their learning styles to different learning contexts. Styles are not rigid and inflexible. Therefore, learners can change their styles to make them helpful in accomplishing different tasks. For example, upon realizing that risk-taking and right-brain dominance are conducive to language learning, the learner will take more risks and strengthen his right-brain to be more successful in language learning.

Studies have proved that successful learners take the responsibility of their learning (Baker & Brown, 1980). Brown (2001) believes successful second language learners know how to manipulate styles when they encounter with language. They know which personality and cognitive characteristics contribute to success in acquisition and try to develop them. He postulates that there are a number of personality and cognitive styles needed for successful learning and proposes 'ten commandments' for good language learning that contain chief style factors a language learner needs to know:

**Table 3**

*Chief Style Factors a Language Learner Needs (Brown, 2001. P.216)*

<i>Teacher's version</i>	<i>Learner's version</i>
1. Lower inhibitions.	Fear not!
2. Encourage risk-taking.	Dive in.
3. Build self-confidence.	Believe in yourself.
4. Develop intrinsic motivation.	Seize the day.
5. Engage in cooperative learning.	Love the neighbor.
6. Use right-brain processes.	Get the BIG picture.
7. Promote ambiguity tolerance.	Cope with the chaos.
8. Practice intuition.	Go with your hunches.
9. Process error feedback.	Make mistakes work for you.
10. Set personal goals.	Set your own goals.

Reid (1995) asserts that learners' awareness of their learning styles makes them capable of taking control of their learning and maximizes learning potential. Gardner and Macintyre (1993) investigated the relationship between four constructs- integrativeness, attitudes, motivation, and language anxiety- and achievement. They came to know that language anxiety highly correlated with achievement. Gardner, et al. (1997) also

found out strong correlation among affective measures and foreign language achievement. Oxford et al. (1993) studied 107 students at the high school level and reported that visual students significantly outperformed auditory and tactic/kinesthetic students.

Hsieh, Jang, Hwang, and Chen (2011) studied the impact of both teaching and learning styles on the learners' level of reflection concerning the differential aspects of both active and reflective modes of learning. They found that "matching the learning styles of students with the appropriate teaching styles can significantly improve students' reflection levels in a u-learning environment" (Hsieh et al., 2011, p.1194).

Van Zwanenberga, Wilkinson and Anderson (2000) studied Felder and Silverman's Index of Learning Styles and Honey and Mumford's Learning Styles Questionnaire. Undergraduate, postgraduate, and even post-experience students majoring in engineering and business from two universities in England filled out the Index of Learning Styles and a biographical data questionnaire. They analyzed the data through comparing results and the academic performance scores on each of the two instruments and found weak correlations between learning style scores and performance among the participants.

Van Daele (2005) investigated "the effect of the extroversion personality variable on the level and the development of oral fluency, complexity and accuracy of Dutch speaking L2 learners of French and English" (p.91). She came to know about the little effect of extroversion on the oral production of Flemish L2 learners of French and English. Her findings showed no effects for measures of fluency. The results revealed that extroversion had not left any impact on the lexical complexity of both French and English for the learners.

Hemmat Nezhad, Jahandar, and Khodabandehlou (2014) studied "the role of individual differences in terms of extroversion vs. introversion, on writing ability of Iranian EFL learners" (p.119). Their findings revealed that individual differences aforementioned did not affect EFL learners' writing ability.

Can (2009) investigated "the effects of science student teachers' academic achievements on their learning styles" (p.1853) and the findings of the study revealed the significant presence of assimilating styles among half of the participants. Other styles such as converging, diverging and accommodating were presented as the preferences of the learners in order

of precedence. Of course no significant relationship was found between the participants' learning styles and achievement levels.

Pei-Jung et al. (2013) carried out an investigation in order to find out the learning styles of students "and to examine the associations between learning style and academic performance" (p.1254). They showed that the most commonly occurring learning style was assimilator (44%), followed by diverger (23%), accommodator (15%), and converger (17%). They concluded that "there was no significant difference in academic performance among the four different styles of learners" (p.1254). The results of another study carried out by TabeBordbar (2013) reported high correlation between the personality traits and learning styles which was conducive to learners' development, self-satisfaction, and improvement in the process of second language learning.

Homayouni's (2011) study on the "relationship between personality traits and emotional intelligence in learning English and math" (p. 839) revealed that:

Learning math was negatively correlated with neuroticism and positively correlated with extroversion and conscientiousness. Learning English was positively correlated with extroversion, openness to experience and agreeableness. Learning English was positively correlated with all components of emotional intelligence. (Homayouni, 2011, p. 839)

### **3. Method**

#### *3.1. Participants*

The participants of the study were initially 257 B.A. level students majoring in English teaching at Imam Khomeini international university in Qazvin and Takestan Islamic Azad University. After homogenizing and administering the questionnaires, only 152 homogenous participants who had answered all the questions of the questionnaires were selected as the main participants of the present study.

#### *3.2. Instruments*

Data collection instruments utilized in this study were as follows:

1. A general proficiency test (MTELP) containing 100 grammar, vocabulary and reading comprehension items in multiple-choice format.

2. To measure the participants' use of learning styles, Honey and Mumford's (1986) questionnaire was used. The questionnaire is divided into four categories:

In the first stage, a general proficiency test was administered to make sure that there were no significant differences among the participants in terms of their proficiency level. (The allocated time for this stage was 45 minutes). Their scores on the test were analyzed. The scores of those who had got more than one standard deviation away from the mean (above or below) were excluded from subsequent analyses. 152 students scoring between one standard deviation above and below the mean remained as the main participations.

Table 4  
*Mumford's (1986) Questionnaire Content*

<i>Activist</i>	<i>Pragmatist</i>
<ul style="list-style-type: none"> <li>• Suited to experiential rather than lectures</li> <li>• Not keen on implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Favors independence</li> <li>• Could undertake more research</li> </ul>
<i>Reflector</i>	<i>Theorist</i>
<ul style="list-style-type: none"> <li>• Conscientious but hard to get started</li> <li>• Assimilates information</li> </ul>	<ul style="list-style-type: none"> <li>• Much time spent working it out</li> <li>• Much redrafting</li> <li>• Detailed investigators</li> </ul>

### 3.4. Data Analysis

To analyze the obtained data and to answer the research question, multiple regression analysis was used.

## 4. Results and Discussion

The research question attempted to see which types of learning styles are predictors of test performance. To this end, a stepwise multiple regression was used. Table 5 shows that pragmatist and reflective styles entered into the regression equation (stepwise criteria:  $p < 0.05$ . reflective was the single best predictor (step1), and pragmatist was the next best predictor (step 2).

Model summary (Table 6) shows that reflective style accounted for 36% of variance in test scores. Reflective and pragmatist styles share over Model summary (Table 6) shows that reflective style accounted for 36% of variance in test scores. Reflective and pragmatist styles share over 38% of the variance in the participants' performance. It means that pragmatist

style has added only 2 percent to the prediction value of the test performance.

Table 7 gives the results of the ANOVA performed on the model. The F-value and the significance level ( $F(1,150) = 88.38, p < 0.01$ ;  $F(2,149) = 48.93, p < 0.01$ ) indicate that both models are significant.

To see how much of the variance in test performance is accounted for by each of the four predictors, the standardized coefficients and the significance of the observed t-value for each predictor were checked. As Table 7 shows, of the four predictors, only reflective and pragmatist styles account for a statistically significant portion of the variance in test performance. For every one standard deviation of change in one's reflective style, there will be about 0.60 of a standard deviation change in one's test performance. This is closely followed by pragmatist style; for every one standard deviation of change in one's pragmatist style, there will be about 0.60 of a standard deviation change in one's test performance.

Table 5  
*Variables Entered/Removed*

<i>Model</i>	<i>Variables Entered</i>	<i>Variables Removed</i>	<i>Method</i>
1	Reflector	.	Stepwise (Criteria: Probability-of-F-to-enter $\leq .050$ , Probability-of-F-to-remove $\geq .100$ ).
2	Pragmatist	.	Stepwise (Criteria: Probability-of-F-to-enter $\leq .050$ , Probability-of-F-to-remove $\geq .100$ ).

a. Dependent Variable: test score

Table 6  
*Model Summary*

<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted Square</i>	<i>R Std. Error of the Estimate</i>
1	.609 <sup>a</sup>	.371	.367	2.32017
2	.630 <sup>b</sup>	.396	.388	2.27997

a. Predictors: (Constant), reflector

b. Predictors: (Constant), reflector, pragmatist

c. Dependent Variable: test score

Table 7  
*ANOVA*

<i>Model</i>		<i>Sum of Squares</i>	<i>Df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
1	Regression	475.788	1	475.788	88.384	.000 <sup>a</sup>
	Residual	807.475	150	5.383		

Total	1283.263	151			
2 Regression	508.721	2	254.361	48.932	.000 <sup>b</sup>
Residual	774.542	149	5.198		
Total	1283.263	151			

- a. Predictors: (Constant), reflector
- b. Predictors: (Constant), reflector, pragmatist
- c. Dependent Variable: test score

The finding of the study revealed that out of the four styles of theorist,

Table 8  
*Coefficients<sup>a</sup>*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	5.741	1.085		5.290	.000
Reflector	.881	.094	.609	9.401	.000
2 (Constant)	3.237	1.459		2.219	.028
Reflector	.870	.092	.601	9.436	.000
Pragmatist	.233	.093	.160	2.517	.013

a. Dependent Variable: test score

activist, reflective, and pragmatist as predictors, only reflective and pragmatist styles account for a statistically significant portion of the variance in test performance. This finding is in line with the results of some previous research asserting that learning styles play a main part in affecting academic achievement.

The present study has employed Honey and Mumford’s (1986) learning style inventory in data collection. Other studies focusing on this scale and its components have reported variety of results both in line with the present findings and opposing to them: Hsieh, et al.’s (2011) study investigating the effects of teaching styles and learning styles on reflection levels of students within the context of ubiquitous learning in particular, at the dimensions of active and reflective learning revealed that matching the learning styles of students with the appropriate teaching styles can significantly improve students’ reflection levels in a u-learning environment. The present finding, however, does not stress the theorist and activist styles, instead it shows that reflective and pragmatist styles enjoy the predictive test performance value.

JafariGohar and Sadeghi's (2015) study exploring whether learning style preferences of EFL learners measured by the Kolb's learning style inventory could have an impact on students' foreign language achievement, indicates that learners' dominant learning style preference were converging, assimilating, accommodating, and diverging, though students' final term scores shows no statistically significant difference between the four learning style categories.

Unlike the results of the present study concerning the predictive value of learning styles towards test performance, Van Zwanenberga, et al. (2000), comparing the academic performance results and learning style scores of the engineering students found a general lack of significant correlations between learning style scores and performance in these samples. Other studies also revealed that the matches between students' learning styles did not affect the students' learning performance (Akdemir & Koszalka, 2008; Massa & Mayer, 2006).

The recent research on the learning style and its relationship with second language development or test performance have also revealed controversial results. Moenikia and Zahed-Babelan (2010) conducting a study to investigate the role of learning styles in second language learning among distance education students found that listening, writing, structure and reading mean scores of students with different learning styles differed significantly, while Srijongjai (2011) reported no significant differences of the students' learning styles based on their achievement levels in the writing class. In line with Srijongjai's (2011) study, Okay (2012) reported no relation between learning styles and any performance lesson while studying the learning styles of music education students.

Soleimani, et al. (2013) who have investigated extroversion /introversion personality types and test performance of students on multiple-choice and true/false reading comprehension test found no statistically significant difference between the personality types of the participants in the study and their performance on the multiple-choice and true/false tests. This is in contrast with the findings of the present study. Another study recently conducted in the Iranian context has focused on the relationship between EFL learners' learning styles and their 12 achievement, finding that visual style is the most preferred while kinesthetic is the least preferred learning style, though the tendencies are different, the success of these students does not show significant differences. Biçer (2014) also claims that the students' achievement levels do not differ significantly with reference to their learning styles since he found no statistically significant differences between the achievement

levels of students who had the same learning styles as their instructors and those who did not.

Neither could Jean and Simard (2013) find any relationship between gains, preferences and learning styles, nor could JafariGohar and Sadeghi's (2014) study find any positive impact of learning style preferences on foreign language achievement.

To sum up, whereas some studies on learning styles have proved the significance and positive role of some styles in developing better test performance, some others reject the significance of such a role believing that there is either no correlation or a weak one between the learning styles and test performance. The findings of the present study in this regard are in line with those of the former group.

## 5. Conclusion and Implications

Through the lens of this study it was found out that learning styles influence the EFL learners' test performance. EFL learners need to know about the styles they could employ both in learning and test performance to gain better results in their second/foreign language learning experience and get near to a native like performance. Therefore, according to the results of the present study, some implications for the effects of learning styles on teaching, learning, and testing of the target language Iranian learners are developing can be suggested.

Learners' learning styles could be identified by second and foreign language teachers to make their learners more aware of their preferred learning styles. The assumption is that participation in a strategy oriented classroom and its practices facilitate learning (O'Malley & Chamot, 1990), and it is expected that learners focus on the input type they receive or what they are exposed to in an attempt to make comparison between what they know what is new to them. The features of input receive is of paramount importance and can lead the learners towards a self-autonomy concerning their own developmental process of the language they are learning. Such an outcome could be the result of a cognitive view developed in the learners to delve into the processes of language acquisition (JafariGohar & Sadeghi, 2015).

Kato (2005) within the framework of SLA pays attention to the role styles awareness plays in L2 development. Although he does not directly focus on the specific styles the present study dealt with, she emphasizes the importance of presence of styles and recognition of

learners' preferences in prompting learners to find better and more successful ways of learning.

English learners could employ styles and find their preferences in styles in developing the foreign language they are studying. This way the classroom interactions could be enriched and would help subsequent L2 development of the learners.

Materials developers in the ELT domain also could employ the present findings to present tasks in which learners' awareness toward learning is enhanced. Such tasks may help the learners move towards self-correction, autonomy, and meaningful learning.

As the findings of this study are mainly pertained to learning styles as predictors of students' test performance, some other issues have been left for further research and investigation as follows:

1. The same questions can be formulated for Iranian language learners at different levels of language proficiency. It is worth investigating whether learners at various proficiency levels employ the same styles as the participants of the present study did.
2. Future studies might consider examining the residual effects of styles taught to the learners to explore whether and how long-term these effects actually could be. A semi-longitudinal study of the concept of style awareness on a specific group of learners can reveal if this theory energizes "retention of styles in the learners' mentality concerning their test performance or not.
3. In addition, the present study examined the relationship between styles and test performance of the EFL learners. Future studies may be needed to replicate the findings in an experimental research concerning the training of styles and/or awaking the learners about their style preferences.
4. Further research is recommended to explore the role of cooperative learning, instructed noticing, attention, and awareness towards styles in developing grammar, vocabulary, or any other skills and components of the second language and their relationship or the probable effect they leave on learner autonomy, self-regulatory factors of learning, test performance, and learner motivation.
5. The age of students was not controlled in this research. The researcher had to assume that no significant difference exist between participants with different ages. The age of the learners could be taken into consideration in another study of the same type with a bigger size to present more generalizable results and findings.

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