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Perceptual Learning Styles and Critical Thinking: Inspecting the Association among EFL Learners

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***Abstract*—Influenced by the acknowledged role of critical thinking and learning styles in the process of second language learning, this study attempted to systematically inspect the association between English as a Foreign Language (EFL) learners' critical thinking, on one hand, and their total score of perceptual learning styles, different perceptual learning styles, and number of major perceptual learning styles, on the other hand. To do so, 595 male and female undergraduate EFL learners, between the ages of 18 and 25 (M_{age} = 22) participated in this study. These participants completed two instruments: a) the questionnaire of critical thinking by Honey (2000), and b) the Perceptual Learning Style Preference Survey developed by Reid (1984). Due to the violation of the assumptions of normality of distribution, the non-parametric Spearman rank order coefficient of correlation was employed in order to answer the initial 3 research questions. The obtained results indicated that there were significant and positive relationships between participants' critical thinking and total score of perceptual learning styles, ρ = .33, n = 595, p < .01; critical thinking and the number of major perceptual learning styles, ρ = .28, n = 595, p < .01; and critical thinking and group, visual, auditory, tactile, and kinesthetic perceptual learning styles. Furthermore, a multiple regression analysis was run which revealed that tactile learning style preference is the best predictor of EFL learners' critical thinking (β = 0.285, t = 6.107, p = 0.0005). The study concludes with a discussion on the findings and stating a number of recommendations for further research.**

***Index Terms*—critical thinking, learning style categories, perceptual learning styles, second language learning**

I. Introduction

The process of learning, including second language learning, is believed to be deeply influenced by learners' internal factors (Lightbown & Spada, 2013; Nosratinia & Zaker, 2014, 2015; O' Donnell, Reeve, & Smith, 2012). Based on the multifaceted nature of human behaviors and capacities, these internal factors are comprised of a myriad of factors, each one dealing with one specific feature (O' Donnell, Reeve, & Smith, 2012; Zaker, 2015). Among these life-and-learning-affecting factors, those dealing with higher-order thinking, e.g. critical thinking, have been under the spotlight for quite a long time (Gardiner, 1995; Moore, 1995; Stapleton, 2001).

The history of critical thinking can be traced back to the instructions of Socrates who introduced this approach of thinking about two thousand years ago (Fisher, 2001). Paul and Elder (2008, p. 58) have defined critical thinking as "The intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action."

Critical thinking is believed to be a fundamental factor in education (Ennis, 1996; Giancarlo & Facione, 2001), in general, and in English language teaching/learning, in particular (Modiano, 2001; Stapleton, 2001), enabling learners to be active agents in the process of learning (Pennycook, 1994). Based on this premise, many attempts have been made in order to reveal its nature and inspect how it is associated with other mental and personality factors (Connolly, 2000; Fahim & Zaker, 2014; Kabilan, 2000; Sarsani, 2006).

According to Larsen-Freeman (1991), learning styles and metacognitive abilities, including critical thinking, both have a facilitative role in promoting second language learning. It is now believed that each learner has a unique way of learning, reflected in learning style, that can have a fundamental role in success or failure in learning (Fewell, 2010; Too, 2007; Zare & Noordin, 2011). Moreover, it has been stated that learning outcome is higher for learners who are able to use multiple learning styles (Mulalic, Mohdshad, & Ahmad, 2009; Reid, 1987). However the way critical thinking and learning styles are associated is an area which has not been thoroughly explored.

Cornett (as cited in Bidabadi & Yamat, 2010) argued that learning styles are the overall patterns that give learning behavior a general direction. Reid (as cited in Vaseghi, Barjesteh, & Shakib, 2013) believes that learning styles are individual, natural, habitual, and preferred way(s) of absorbing, processing, and retaining new information and skills. According to Reid (1995), learning styles can be divided into three major categories: cognitive learning styles, sensory learning styles, and personality learning styles.

Sensory learning styles can also be categorized into three main classifications: Perceptual, Environmental, and Personality learning styles (Reid, 1995). These three learning styles also have subcategories of learning style preferences depending on characteristics and learners' learning. Based on this premise, Perceptual learning styles refer to (Reid, 1995):

a) Visual learning: Learning more effectively through the eyes (reading and studying charts);
b) Auditory learning: Learning more effectively through the ears (listening to lectures);
c) Kinesthetic learning: Learning more effectively through body experience (physical responses);
d) Tactile learning: Learning more effectively through touch (as in building models);
e) Individual learning: Learning more effectively through working alone; &
f) Group learning: Learning more effectively through working with others.

The classification offered by Reid (1995) seems to be comprehensive enough for studying the learning styles from different perspectives. However, in order to narrow down the scope of the present study and enhance the validity and generalizability of the findings (Best & Kahn, 2006), perceptual learning styles are chosen as the focus of the study. As a result, and motivated by the abovementioned premises, this study attempted to systematically study the way critical thinking and perceptual learning style preferences are associated among Iranian EFL learners. To do so, the following research questions were phrased:

Q_1: Is there any significant relationship between EFL learners' critical thinking and total perceptual learning style preferences?

Q_2: Is there any significant relationship between EFL learners' critical thinking and number of major perceptual learning styles?

Q_3: Is there any significant relationship between EFL learners' critical thinking and different perceptual learning styles?

Q_4: Among EFL learners' group, visual, auditory, tactile, and kinesthetic perceptual learning styles, which one is a better predictor of their critical thinking?

II. Method

Participants

The participants of the present study were 595 male and female EFL learners who were undergraduate students of English Literature, English Translation, French Literature, German Literature, Chemistry, Civil Engineering, Electrical Engineering, and Management at Islamic Azad University at Central Tehran. Their ages ranged from 18 to 25 (M_{age} = 22). The process of participants' selection was done conveniently, i.e. the participants were chosen on the basis of their availability at the time of data collection (if they were willing to participate). The preliminary number of participants was 687, but 92 participants were excluded from the data for providing careless and incomplete answers. As a result, the final number of participants was 595.

Instrumentation

Critical Thinking Questionnaire

In order to estimate participants' critical thinking capacity, the critical thinking questionnaire developed by Honey (2004) was chosen. However, in order to avoid any misinterpretation and misunderstanding, the Persian version of this questionnaire which has been translated and validated by Naeini (2005) was administered to the participants. Both original and translated versions of this questionnaire contain 30 Likert-type items to investigate the ability in note-taking, summarizing, questioning, paraphrasing, researching, inferencing, discussing, classifying, outlining, comparing and contrasting, distinguishing, synthesizing, as well as inductive and deductive reasoning.

The participants were asked to rate the frequency of each category they use on a 5-point Likert-type scale, ranging from *never* (1 point), *seldom* (2 points), *sometimes* (3 points), *often* (4 points), to *always* (5 points). The ultimate scores could be within the range of 30 to 150. The allocated time for completing this questionnaire was 20 minutes. In a study conducted by Nosratinia and Zaker (2013) on Iranian EFL learners, the reliability of this questionnaire was estimated to be 0.81 using Cronbach's alpha coefficient. In this study, the reliability of this questionnaire was estimated to be .82 using Crpnbach's alpha.

Perceptual Learning Style Preference Survey

In order to estimate the capacity of participants in the components of perceptual learning style (see introduction) and calculate the total score of perceptual learning styles, the Perceptual Learning Style Preference Survey was chosen. Developed by Joy Reid in 1984, this instrument is the first perceptual learning style questionnaire widely known in our field. However, in order to remove the probable language barriers, the researchers used the Persian translated version of this instrument, by Riazi and Mansoorian (2008).

This instrument consists of 30 randomly ordered statements and participants respond on the basis of a five point Likert-scale, ranging from *Strongly Agree* (1 point), *Agree* (2 points), *Undecided* (3 points), *Disagree* (4 points) to *Strongly Disagree* (5 points). The six components of perceptual learning style are measured through questions 6, 10, 12, 24, and 29 (Visual); questions 1, 7, 9, 17, and 20 (Auditory); questions 2, 8, 15, 19, and 26 (Kinesthetic); questions 11, 14, 16, 22, and 25 (Tactile); questions 3, 4, 5, 21, and 23 (Group Learning); and questions 13, 18, 27, 28, and 30 (Individual Learning). As stated by Reid (1995), the scores on each test item should be multiplied by 2. If the total score

for each component (e.g. Visual), which includes 5 items, ranges from 38 to 50, that component is recognized as a major perceptual learning style.

The allocated time for answering this questionnaire was 20 minutes, and the total score could range from 60 to 300. Riazi and Mansoorian (2008) reported a reliability index of 0.79 for the instrument, using Cronbach's alpha coefficient, and in this study, the reliability index was estimated to be .80 using Crpnbach's alpha.

Procedure

Initially, the conveniently selected participants (n = 687) received a package, including the two questionnaires. The researchers provided a brief explanation about the nature of the study and the purpose of data collection. Moreover, participants were assured of the confidentiality of the information they provide. Also, they were informed that the collected data would be used for research purposes only. Furthermore, in order to motivate them, they were given the chance to receive their results on the instruments via email.

After collecting the 595 sets of usable questionnaires, they were scored, and for every single participant, 9 scores were entered into the data set. These scores were:

1. total critical thinking score
2. total perceptual learning style score
3. the number of major perceptual learning styles
4. visual learning style score
5. auditory learning style score
6. kinesthetic learning style score
7. tactile learning style score
8. individual learning style score
9. group learning style score

III. Results

This descriptive study attempted to answer four research questions. Answering the first, second and third research questions required employing a correlational analysis. Observing a statistically significant relationship between critical thinking and different perceptual learning styles was the prerequisite for dealing with the fourth research question, answered through running a multiple regression. The following provide information on the analyses and the assumptions which were checked in advance.

Preliminary Analyses

Before answering the research questions of this study, it was needed to check a number of assumptions and perform some preliminary analyses. To begin with, the assumptions of interval data and independence of participants (Tabachnick & Fidell, 2007) were already met as the present data were measured on an interval scale and the participants were independent of one another. In addition, it was needed to check some other significant assumptions through inspecting the features of the data. These assumptions, according to Tabachnick and Fidell (2007), are:

a) Linear relation between each pair of variables,

b) Homoscedasticity, and

c) Normality of the distribution of variables.

To check the linearity of relations pertinent to the three initial research questions, the researchers visually inspected the data through two scatterplots and one multiple scatterplot. The inspection revealed that the linearity of relations among the variables could not be confirmed. Moreover, in many cases, the distribution of scores was funnel shape; so, the assumption of homoscedasticity was not met for these variables.

In order to check the normality of the distributions, two procedures were followed. First, the descriptive statistics of the data were obtained and kurtosis and skewness ratios were calculated; this was followed by inspecting the distribution histograms and Normal Q-Q Plots. Second, the Kolmogorov-Smirnov test was run as a further attempt to inspect the normality of the distributions.

The distribution for the scores (except for individual learning style preference) was not normal as almost all of the skewness ratios and the kurtosis ratios did not fall within the range of -1.96 and +1.96. Following this, the actual shapes of the distribution of the scores and the normal probability plots were checked whose inspection, influenced by the large number of participants, supported the normality of distributions.

Following this, Kolmogorov-Smirnov test was run, results of which are presented in Table 1.

TABLE 1:
TESTS OF NORMALITY OF THE SCORES

	Kolmogorov-Smirnov[a]		
	Statistic	Df	Sig.
Critical Thinking	.061	595	.000
Total Perceptual Learning Styles	.059	595	.000
Visual	.102	595	.000
Auditory	.097	595	.000
Kinesthetic	.102	595	.000
Tactile	.091	595	.000
Individual	.073	595	.000
Group	.078	595	.000
Number of Major Perceptual Learning Styles	.163	595	.000

As presented in Table 1, the Sig. values are less than .05. This point suggests that the assumption of normality is violated. Although this violation is quite common in large samples (Tabachnick & Fidell, 2007), considering the results obtained in the previous sections, it was systematically suggested that the assumption of normality is violated. Therefore, the pertinent research questions were answered through employing non-parametric tests.

The First Research Question

Regarding the relationship between EFL learners' critical thinking and total perceptual learning style preferences, the data were analyzed using the Spearman rank order coefficient of correlation. Table 2 shows the result of this analysis.

TABLE 2:
SPEARMAN'S CORRELATION BETWEEN CRITICAL THINKING AND TOTAL PERCEPTUAL LEARNING STYLE PREFERENCES

			Critical Thinking	Total Perceptual Learning Styles
Spearman's rho	Critical Thinking	Correlation Coefficient	1.000	.335**
		Sig. (2-tailed)	.	.000
		N	595	595

**. Correlation is significant at the 0.01 level (2-tailed).

According to Table 2, it was concluded that there was a significant and positive correlation between critical thinking and total perceptual learning style preferences, $\rho = .33$, $n = 595$, $p < .01$. This signified a medium effect size supplemented by a very small confidence interval (0.262 – 0.404).

The Second Research Question

Regarding the relationship between EFL learners' critical thinking and number of major perceptual learning styles, the data were analyzed using the Spearman rank order coefficient of correlation. Table 3 shows the result of this analysis.

TABLE 3:
SPEARMAN'S CORRELATION BETWEEN CRITICAL THINKING AND THE NUMBER OF MAJOR PERCEPTUAL LEARNING STYLES

			Critical Thinking	Number of Major Learning Styles
Spearman's rho	Critical Thinking	Correlation Coefficient	1.000	.278**
		Sig. (2-tailed)	.	.000
		N	595	595

**. Correlation is significant at the 0.01 level (2-tailed).

According to Table 3, it was concluded that there was a significant and positive correlation between critical thinking and the number of major perceptual learning styles, $\rho = .28$, $n = 595$, $p < .01$. This signified a small effect size supplemented by a very small confidence interval (0.203 – 0.35).

The Third Research Question

Regarding the relationship between EFL learners' critical thinking and different perceptual learning styles, the data were analyzed using the Spearman rank order coefficient of correlation. Table 4 shows the result of this analysis.

TABLE 4:
SPEARMAN'S CORRELATION BETWEEN CRITICAL THINKING AND DIFFERENT PERCEPTUAL LEARNING STYLES

			Critical Thinking	Visual	Auditory	Kinesthetic	Tactile	Individual	Group
Spearman's rho	Critical Thinking	Correlation Coefficient	1.000	.090*	.125**	.282**	.340**	.016	.093*
		Sig. (2-tailed)	.	.029	.002	.000	.000	.692	.024
		N	595	595	595	595	595	595	595

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Based on the obtained results reported in Table 4, it was concluded that:

a) There was a significant and positive correlation between critical thinking and visual learning style preference, ρ = .09, n = 595, p < .05. This signified a very small effect size supplemented by a small confidence interval (0.01 – 0.169).

b) There was a significant and positive correlation between critical thinking and auditory learning style preference, ρ = .12, n = 595, p < .01. This signified a small effect size supplemented by a small confidence interval (0.041 – 0.198).

c) There was a significant and positive correlation between critical thinking and kinesthetic learning style preference, ρ = .28, n = 595, p < .01. This signified a small effect size supplemented by a very small confidence interval (0.205 – 0.352).

d) There was a significant and positive correlation between critical thinking and tactile learning style preference, ρ = .34, n = 595, p < .01. This signified a medium effect size supplemented by a very small confidence interval (0.267 – 0.409).

e) There was not a significant correlation between critical thinking and individual learning style preference.

f) There was a significant and positive correlation between critical thinking and group learning style preference, ρ = .09, n = 595, p < .05. This signified a very small effect size supplemented by a very small confidence interval (0.013 – 0.172).

Based on the abovementioned findings, all of the perceptual learning styles, except individual learning style preference, were significantly related to critical thinking. As a result, the researchers could consider answering the fourth research question, considering these 5 variables as the predictor variables of the analysis.

Preliminary Analyses Pertinent to the Fourth Research Question

The fourth research question of this study was answered through running a multiple regression analysis. However, there are a number of assumptions which had to be checked before performing the analysis (Tabachnick & Fidell, 2007). Regarding sample size, using the criterion proposed by Tabachnick and Fidell (2007), N > 50 + 8m (where m = number of independent variables), the sample pool seemed to be large enough to meet this assumption.

Regarding the assumption of Multicollinearity, the relationship among the 5 variables was checked using the Spearman rank order coefficient. Results indicated that the 5 perceptual learning styles did not show high levels of correlation. In addition, checking the Tolerance values and VIF values indicated that all the Tolerance values were higher than .1. Moreover, all the VIF values were lower than 10. Therefore, it was concluded that multicollinearity did not exist in this sample.

For checking normality in the regression analysis, the Normal Probability Plot (P-P) was checked (Figure 1) whose inspection suggested no major deviation from normality.

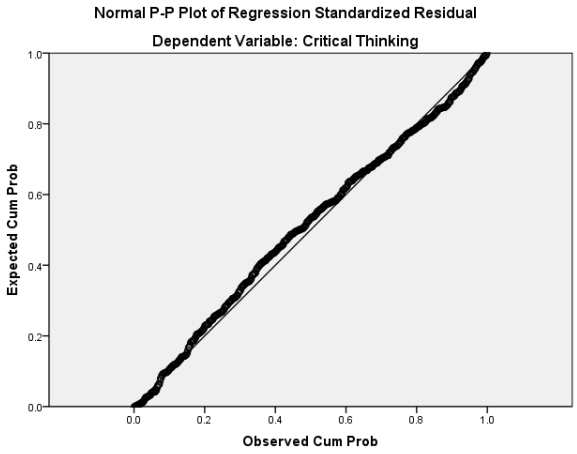

Figure 1: The normal P-P plot of regression standardized residual

Finally, in order inspect the existence of outliers, the researchers inspected the Mahalanobis distance, indicating that only 2 cases had Mahalanobis values above the critical value. According to Tabachnick and Fidell (2007), in large samples, the existence of a number of outliers would not cause a problem. Based on the results of the preliminary analyses reported above, it was then legitimate to run a multiple regression in order to answer the fourth research question.

The Fourth Research Question

As reported earlier, the correlations between critical thinking and 5, out of 6, perceptual learning styles turned out to be significant. These 5 perceptual learning styles were: group, visual, auditory, tactile, and kinesthetic learning styles. In order to realize which one of these factors can predict critical thinking better, a standard multiple regression was run. Table 5 presents the regression model summary including the R and R^2.

TABLE 5:
MODEL SUMMARY – R AND R SQUARE

Model	R	R^2	Adjusted R^2	S E of the Estimate
1	.377[a]	.142	.135	15.355

a. Predictors: (Constant), Group, Visual, Auditory, Tactile, Kinesthetic
b. Dependent Variable: Critical Thinking

As reported in Table 5, *R* came out to be 0.377 and R^2 came out to be 0.142. This means that the model explains 14.2 percent of the variance in critical thinking (Cohen, Cohen, West, & Aiken, 2003). Moreover, $f^2 = 0.16$ indicated a small effect size for the regression. Table 6 reports the results of ANOVA (F (5, 589) = 19. 5, p = 0.0005), the results of which were considered significant. This means that the model can significantly predict EFL learners' critical thinking.

TABLE 6:
REGRESSION OUTPUT: ANOVA

ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	23051.102	5	4610.220	19.552	.000[a]
	Residual	138880.283	589	235.790		
	Total	161931.385	594			

a. Predictors: (Constant), Group, Visual, Auditory, Tactile, Kinesthetic
b. Dependent Variable: Critical Thinking

Table 7 demonstrates the Standardized Beta Coefficients. The inspection of the Sig. values shows that among the 5 predictor variables, only kinesthetic and tactile learning styles make statistically significant unique contributions to the equation as their Sig. values were less than .05.

TABLE 7:
REGRESSION OUTPUT: COEFFICIENTS

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	SE	β	T	Significance
1	(Constant)	53.267	6.670		7.986	.000
	Visual	.174	.120	.057	1.457	.146
	Auditory	.132	.111	.047	1.186	.236
	Kinesthetic	.287	.127	.107	2.249	.025
	Tactile	.715	.117	.285	6.107	.000
	Group	-.035	.079	-.018	-.436	.663

The comparison of β values revealed that tactile learning style has the largest β coefficient (β = 0.285, t = 6.107, p = 0.0005). This means that tactile learning style makes the strongest statistically significant unique contribution to explaining critical thinking. Therefore, it was concluded that tactile learning style could predict more significantly the critical thinking scores of the candidates. Moreover, kinesthetic learning style was ranked as the second predictor of critical thinking.

IV. DISCUSSION

It is now believed that second language learning is deeply influenced by learners' internal factors (Lightbown & Spada, 2013; Nosratinia & Zaker, 2014). Among these internal factors, those dealing with higher-order thinking, e.g. critical thinking, have attracted special attention. As a result, many attempts have been made in order to reveal its nature and inspect how it is associated with other mental and personality factors (Connolly, 2000; Kabilan, 2000; Sarsani, 2006). According to Larsen-Freeman (1991), learning styles and metacognitive abilities, including critical thinking, both have a facilitative role in promoting second language learning. Moreover, it has been stated that learning outcome is higher for learners who are able to use multiple learning styles (Mulalic, Mohdshad & Ahmad, 2009; Reid, 1987).

Motivated by the abovementioned premises, this study attempted to systematically study the way critical thinking and perceptual learning styles are associated among Iranian EFL learners. To do so, four research questions were formulated which questioned: a) the relationship between critical thinking and the total score of perceptual learning styles; b) the relationship between the number of major perceptual learning styles in a learner and their critical thinking; c) the relationship between critical thinking and different perceptual learning styles; and d) the predictive power of different perceptual learning styles about critical thinking.

The first research question attempted to systematically explore the way EFL learners' critical thinking and perceptual learning styles are associated. Larsen-Freeman (1991) favors the significant role of both learning styles and metacognitive factors, e.g. critical thinking, in language learning. However, there are not many studies in which the bilateral relationship between these two variables has been studied in a systematic fashion. In fact, Torres and Cano's

(1995) study was the only one that the researchers could come up with, and there seemed to be no attempt to explore this bilateral relationship in the Iranian EFL context.

This study could not reject the existence of a significant and positive correlation between critical thinking and total perceptual learning style preferences. This significant relationship seems to confirm the findings of Torres and Cano (1995). However, it cannot be ignored that the magnitude of the relationship between the two variables raises doubts about the meaningfulness of the relationship (Henning, 1987; Springer, 2010). Perhaps other studies would reduce this uncertainty through replicating this study in similar and different contexts.

This study, as stated in the second research question, inspected the relationship between critical thinking and the number of major perceptual learning styles. The rationale behind posing this question was the possibility of having a high comparative number of major perceptual learning styles and, at the same time, having a low total score of perceptual learning style preferences, and vice versa. The results indicated the existence of a significant and positive correlation between critical thinking and the number of major perceptual learning styles. However, regarding the magnitude of the relationship and its meaningfulness, this result should be interpreted with caution (Henning, 1987; Springer, 2010). Based on these concerns, it seems reasonable to argue that the number of major perceptual learning styles by itself cannot determine one's critical thinking, and the total score is a more valid representative of learning style preferences.

Through answering the third research question, it was intended to provide a more vivid understanding about the relationship between critical thinking and perceptual learning styles. Out of the 6 perceptual learning styles, 5 of them were significantly associated with critical thinking. The relationship between critical thinking and tactile learning style preference had the largest comparative effect size among the other four significant relationships. This seems to confirm the findings of Riazi and Mansoorian (2008) in which tactile learning style preference is among the highly influential perceptual learning styles. Moreover, the low effectiveness of individual learning style preference was also reported by Riazi and Mansoorian (2008). Therefore, based on the content of the pertinent to this learning style (in the instrument) and the definitions, it can be argued that EFL learners' tendency to work individually would not be conducive to the promotion of critical thinking and, as a result, language learning (Connolly, 2000; Fahim & Zaker, 2014; Kabilan, 2000; Sarsani, 2006; Stapleton, 2001). This is also in line with the constructivist theory of learning which favors active construction of language competence through social and experiential process (Ashton-Hay, 2006; Sprenger & Wadt, 2008).

The final research question attempted to compare these 5 perceptual learning styles in predicting critical thinking. Running a multiple regression analysis revealed that tactile learning style preference makes the strongest statistically significant unique contribution to explaining critical thinking, followed by kinesthetic learning style preference. This finding is supported by the findings of Naserieh and Anani Sarab (2013) in which kinesthetic and tactile perceptual learning styles had the highest degree of influence. Therefore, based on the features of these learning styles, it seems reasonable to argue that in order to promote critical thinking among language learners, hands-on activities, in-class projects, carrying out practical tasks, and other similar activities should be incorporated in the body of language instruction (Dill, 2012; O' Donnell, Reeve, & Smith, 2012).

Mulalic, Mohdshad, and Ahmad (2009) and Reid (1987) rightly argue that learners should be encouraged to employ multiple learning styles. This, they argue, will promote the language learning process. This point seems to be in line with the obtained answer to the second research question of this study. Through answering the second research question, it was concluded that all the perceptual learning styles together can predict critical thinking better. This is to say that EFL teachers should encourage all the perceptual learning styles by introducing a wide range of activities to the classroom practice.

One of the findings of this study was that individual learning style preference does not make a contribution to critical thinking and, as a result, language learning. It provides support for the notions of the constructivist theory of learning, favoring the role of interaction and collaboration in learning (Ashton-Hay, 2006; Sprenger & Wadt, 2008). As a result, EFL teachers should plan the classroom instruction in a way that interaction and collaboration are favored. For instance, different collaborative tasks, as introduced by Ellis (2008), should be employed in the classroom. Moreover, group presentation, and problem sets can be employed to promote group activities and critical thinking itself (Whittington, Lopez, Schley, & Fisher, 2000).

There is a unanimous consensus among language educators that learners play a crucial role in the process of learning (Mitchell & Myles, 2004; Richards & Rodgers, 2001). The findings of the present study can assist learners in developing critical thinking indirectly. More specifically, the findings of this study highlight the importance of developing different perceptual learning styles. Therefore, EFL learners should have flexible learning beliefs and attempt to diversify their learning techniques.

Based on the findings of the present study, EFL syllabus designers are encouraged to prepare tasks and activities in which employing different strategies (categorized as perceptual learning styles) are required. In fact, the results of the present study confirm the idea that EFL learners should be exposed to a wide range of activities, requiring them to employ different techniques (Mulalic, Mohdshad, & Ahmad, 2009).

Based on the principles of descriptive research, the focus of this study, its peculiarities, and the characteristics of the learners, there are a number of areas which were not touched in this study. Furthermore, other studies are required to

inspect relevant concepts and confirm the results of this study. Accordingly, a limited number of recommendations are presented here. First, it is suggested to compare the variables of this study in predicting different language skills. Second, the same study could be conducted among other age groups. Third, it is suggested to replicate this study in a way that the numbers of male and female participants are equal. Finally, this study can be replicated employing some qualitative instruments to increase the validity and reliability of the results and interpretations.

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