

Original Article

Learning Styles and Attention Control; the Case of Iranian Female EFL Learners

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Abstract

This study aimed to find out the most dominant learning style among Iranian EFL learners and the potential differences in attention control of the learners with various learning styles. In doing so, the Grasha-Richmann scale and a Victoria Stroop test were applied. A one-way ANOVA and then a post hoc test was run to find out the possible differences among learners with various learning styles in terms of attention control. The findings revealed the most preferred style was the Independent style, by contrast, the participative was the least frequent one. In addition, the avoidant learning style was not found in EFL learners' preferences. A one-way ANOVA test was run to find out the attentional control differences in learners with various styles. The results indicated a significant difference among learners in terms of attention control and also language learners with independent learning styles performed better on the attentional control test.

Keywords: Attentional control, EFL learner, Grasha-Richmann student learning styles scale, Learning style, Victoria Stroop Test

1. Introduction

One of the major concerns in the field of education is learning effectively. Obtaining enough information on the behavior of the learners can facilitate the process of learning. The achievement of second language learning is not only because of cognitive factors but also affective, personality, motivational, and demographic factors (Brown, 2000); individuals' style is of excessive prominence (Carrel et al., 1996). Learners differ in their learning preferences (Dunn & Stevenson, 1997). Learning style in education is not new. For the past three decades, various studies have been performed on learning styles (e.g., Lewis, 2011).

Reid (1995) categorized learning-style investigation into three main classes: cognitive learning style, sensory learning style, and personality learning style. Cognitive learning styles are further categorized as Field-independent or Field-dependent learning styles; those learning more effectively step by step, starting with evaluating facts and continuing to ideas. In contrast, Field dependent individuals learn in context and holistically. Analytic or global learning style is the way that the learners learn in isolation and desire setting objectives. On the other hand, global learners learn more successfully over concrete experience and in collaboration with other people. Reflective or impulsive learning style is the way that learners learn more efficiently when they have a chance to study possibilities before replying. At the same time, impulsive learners reply instantly and take risks.

One of the pioneers in learning style research is Dunn (1984), who identified different styles for learning. Among different definitions proposed for learning style, Grasha (1996) described learning styles as personal characteristics that impact a learner's ability to obtain information, to interact with peers and the instructor, and to take part in learning experiences. The six learning styles in this model are competitive, collaborative, avoidant, participant, dependent, and independent. The characteristics of each style are summarized in Table 1.

Table 1.

Summary of the Grasha-Riechmann Learning Style

Competitive	Students tend to compete with others for the rewards and be at the center of attention
Collaborative	Learners share their ideas and talents and cooperate with others
Avoidant	They are not interested and do not participate in class activities
Participant	They are eager to take part in class activities and prefer to have discussion
Dependent	They are not curious and tend to get support from others.
Independent	They tend to work alone and are confident in learning by themselves.

Prior research has shown that students learn better when they are conscious of their learning styles (Barman & Muhamed Yusoff, 2014; O'Connor, 1997). As an instance, when a learner does not perform well in listening, they can apply visual learning strategies such as note-taking while listening and these strategies will make the learning process better. Recent studies have examined learning styles by various questionnaires (Chetty et al., 2019; Ghasemi et al., 2014; Li, 2012). In a study by (Izadi & Mohammadzadeh Edmolae, 2008), the importance of learning styles, especially active learning and abstract conceptualization, as the prediction of educational performance of learners was highlighted. Csapo and Hayen (2006) found that a mismatch between university students' and faculties' learning styles results in an ineffective learning process.

Baneshi et al. (2014) examined the learning style differences between science and humanities majors in undergraduate and graduate students in Tehran. Female students were cooperative, participative, and dependent styles. In another investigation into learning styles, Azarkhordad and Mehdinezhad (2016) found that student teachers in Zahedan were dominant in cooperation, dependent, and partnership styles on GRSLSS inventory. In a similar study, İlçin et al. (2018) aimed to identify the Turkish undergraduate students' learning styles and whether the learning styles could affect on academic performance. The learning style was positively associated with academic performance. In addition, they found the collaborative style as the most common learning style among participants. Recently, an empirical study by Cimermanová, (2018) tried to find potential relation between the preferred learning style, the form of teaching, and academic achievement. Although, the study did not reveal any relationship between the learning styles, the form of teaching, and learners' performance. Generally, recognizing students' learning styles can facilitate the process of learning as it helps instructors develop more efficient curriculum and educational programs compatible with learners' preferences and consequently motivates students' participation to gain knowledge effectively.

Previous investigations tried to explore influencing factors on the learning process, including individual differences and cognitive measures. For example, Graf et al. 2005 investigated the learning styles and the relationship between the styles and cognitive characteristics of students. They revealed that learners with low working memory capacity prefer an active, sensing, visual, and global learning style. In contrast, those with higher working memory capacity tend to be reflective, intuitive, and sequential. In the same vein,

(Onyekuru, 2015) examined the relationships among field dependence-field independence cognitive style, gender, job choice, and academic achievement of the students in Nigeria. They found a significant association between field-(in)dependence cognitive style and gender. According to their findings, field-independent students had a higher mean in sciences whereas field-dependent students had a higher mean achievement in arts. Moreover, there was a significant relationship between field dependence-field independence cognitive style and job choice.

One domain of research that has been little explored is the relationship between learning styles and attentional control. Attention is essential for language learning to happen and a level of attention named noticing is the significant need for learning grammatical rules of a second language. Noticing presented as one of the three functions of output in SLA can be measured to have some levels (Schmidt, 1990). In what Schmidt and Frota (1986) named noticing the gap principle, learners notice how their interlanguage is unlike the target language. On another level, learners notice that they cannot say what they want to say exactly in the target language. Nonetheless, there are some conflicts among researchers on the part and amount of consciousness in learning (Izumi, 2002).

As our ability to distinguish, process, and understand all surrounding motivations is restricted, we must discern these stimuli. Attention manages both the choice of stimuli and the recording of it in memory. No input is obtained for more processing except it is joined. Attention can be presented to one stimulus in preference to another and maybe concerned with overtly or covertly. Attention itself can have several basic processes, including sensory selection, response selection, attentional capacity, and sustained performance. It is widely accepted that attention plays a significant role in language learning (Robinson et al., 2013). Schmidt (2010) has expressed that "people learn about the things that they attend to and do not learn much about the things they do not attend to" (p. 7). Previous studies in cognitive psychology and second language acquisition (SLA) have also examined the role of attention in mediating input and learning. Results of such research show that attention is essential for learning to happen (Robinson, 1995; Schmidt, 2012).

Only a few research shed light on the differences in attentional control of EFL learners with various learning styles so far. Guisande et al. (2007) assessed children with various field dependence-independence cognitive styles to find the potential differences in tasks measuring aspects of attentional functioning. Because learners' attention level affects

learning achievements and also learning English as a foreign language in Iran generally happens in the classroom context, where instructors play a significant role and students' learning process is largely affected by the teaching activities, any language instructor needs to follow helpful ways to enhance more input into intake by raising learners' awareness and consider the role that various factors such as learning styles play in attention control. In the previous research, attentional control has been examined via neuropsychological assessment tools namely Posner task, attention network test, Flanker task, and Stroop test. The Stroop color-word test has been a widely used task to measure attentional control (e.g., Cohen et al., 1989; Zhang et al., 2013). Participants need to control their attention on the color of the words while reading and this requires some degree of attention.

The present study is significant for teachers as it equips them with knowledge about the variety of language learning styles among their students and consequently assists them apply methods to meet the students' requirements. Further, it can give learners perspectives into their possible learning abilities and weaknesses. Considering the importance of attention and learners' styles in students' performances, the current study aims to explore the most dominant language learning style among Iranian advanced female EFL learners and also to examine whether there is a significant difference in attentional control of the learners with various learning styles.

The questions posed in the present study are as follows:

1. What is the dominant learning style among Iranian advanced female EFL learners?
2. Is there a significant difference in attentional control of Iranian advanced female EFL learners with various learning styles?

3. Methodology

3.1. Design and Context of the Study

Due to research questions and the nature of the study, the current research was carried out quantitatively and has a cross-sectional design. The convenience sampling method was employed and the study was carried out in Kermanshah, Iran.

3.2. Participants

A total of ninety-four advanced female learners, ranging in age from 19 to 30 ($M = 23.8$, $SD = 3.2$), were recruited from different language institutes, Kermanshah, Iran. The

selection of the participants was determined based on the language schools' hierarchy to ensure that they were homogeneous regarding their knowledge of English. It is worth mentioning that the language school administers an actual TOEFL PBT test before letting the students attend the advanced courses and allows only those who score above 540 to attend the advanced course. All of the participants were undergraduate students. They belonged to middle socioeconomic status, which was determined via a detailed self-report questionnaire based on an individual's occupation and the highest level of formal education.

3.3. Instruments

3.3.1 Grasha-Richmann Student Learning Styles Scale

To identify the learners' learning styles, (Grasha, 1996) learning styles, adopted from Baneshi et al. (2013), was utilized. It consists of six styles, collaborative, avoidant, competitive, dependent, participative, and independent, and 51 items. Each item needed the participants to respond by always, often, sometimes, rarely, never. A learner was recognized as potent in a style if she got the highest average score on that style. The questionnaire was considered a valid and reliable test as Baneshi et al. (2013) reported its high validity and reliability in Iranian context.

3.3.2 Victoria Stroop Color-Word Test (VST)

To assess the learners' attention control, a computerized VST, implemented in Psychopy software, was applied. The Victoria version has several merits. First, it is concise, unlike other versions with many parts on each component activity so participants do not get extended practice during the test. Second, an interference score independent of cognitive speed is calculated. Researchers mostly rely on the interference score, the VST is in the generic realm, and those who employ the test may make their stimuli (Strauss et al., 2006).

The test consists of three different slides (Dots, Words, and Colors) with 24 stimuli in four colors: green, yellow, blue, and red. All the slides have 6 rows of 4 items. In the first slide, colored dots were presented randomly. In "word" condition, neutral Persian words; درب (door), روز (Chetty et al., 2019), اما (but), چپ (left) were shown in different colors. On the color-word slide, the words آبی (blue), قرمز (red), سبز (green), زرد (yellow)

were presented in contrasting colors, red, blue, green, or yellow. VST has been validated in a variety of research previously (reviewed in (Malek et al., 2013).

3.4. Data Collection Procedure

Participants were invited to complete a Grasha Riechmann Student Learning Style Scale. The students responded to the instrument by checking one of the five-point Likert scales ranging from always to never. Thereafter, the VST was administered. Participants were instructed to say the color of the dots or the font color of the words on each slide. The researcher recorded the participants' voices during color naming in Persian to measure the time and the number of errors. Since the Persian alphabetical system is read and written from right to left, participants were asked to name the colors of the dots or the words from right to left in each row as quickly and accurately as possible. The examiner moved to the next slide by pressing the 'space' key after naming the colors in each slide. An immediate correction was made by the examiner in case the participants did not correct their errors themselves as suggested by Strauss et al. (2006). The VST produces three scores: time to complete part D (dots), part W (neutral words), and part C (colors). To examine inhibitory control, we calculated the interference score: time to complete the Color word slide divided by the time to complete the Dot slide (Strauss et al., 2006).

3.5. Data Analysis Procedure

A one-way ANOVA test on SPSS was run to find out the differences among learners with various learning styles in terms of attentional control. In addition to the ANOVA test, a post hoc test was employed to find out more detailed information on the differences among learners with various language learning styles in terms of attention control. To determine the reliability of the Victoria Stroop test, two weeks before the main test, the researcher administered VST with 35 of the participants. The result of Cronbach's alpha for test-retest reliability indicated high reliability ($r = 0.87$).

4. Results

4.1. Addressing the First Research Question

To find out the most dominant learning style among Iranian EFL learners, the mean score for each learning style, preferred by English learners, was computed. A learner was

recognized as potent in a style if she got the highest average score on that style. Table. 2 indicates the descriptive statistics of five language learning styles.

Table 2.

Descriptive Statistics Needed for Comparing the Language Learning Styles

	<i>N</i>	Minimum	Maximum	Mean	<i>Std. Deviation</i>
Collaborative	18	9.05	26.24	14.21	5.68
Participative	20	7.9	16.71	11.03	3.52
Dependent	22	12.17	14.84	13.38	.84
Competitive	18	7.33	17.26	13.36	3.39
Independent	16	11.06	22.44	17.31	4.44

As the mean score in each learning style shows, the preferred styles by the participants are independent, collaborative, dependent, competitive, and participative hierarchically. Therefore, it can be concluded that the independent style was the most dominant learning style among Iranian EFL learners. It should be mentioned that the avoidant style was not selected by the learners.

4.2. Addressing The Second Research Question

First, we tested the normality of the data and the homogeneity of variances. As the result of the Shapiro-Wilk test shows the assumptions of normality have been met (see Table 3). The result of Levene's test indicated that the assumption of the equality of variances has been violated, $F(4, 89) = 2.8, P = 0.03$.

Table 3.

Tests of Normality

VST	Styles	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	<i>df</i>	<i>Sig.</i>	Statistic	<i>df</i>	<i>Sig.</i>
	Participative	.151	20	.200*	.923	20	.112
	Collaborative	.317	18	.000	.817	18	.093
	Competitive	.234	18	.010	.823	18	.053
	Dependent	.163	22	.135	.918	22	.170
	Independent	.210	16	.058	.863	16	.051

Therefore, due to the inequality of sample size and heterogeneity of variances, Welch’s ANOVA was run. Table. 4 shows a statistically significant difference between learners’ styles attentional control, $F(4,42) = 4.1, p = 0.006$.

Table 4.

Welch’s ANOVA Test

Robust Tests of Equality of Means				
VST				
	Statistic ^a	df1	df2	Sig.
Welch	4.132	4	42.429	.006

Post hoc comparisons were then run using the Games-Howell test and the figures revealed that the mean score for attentional control in independent learning style ($M = 2.3, SD = 0.38$) was significantly different from Participative, Competitive and Dependent style ($P < 0.05$) on the Victoria Stroop test (see Table 5).

Table 5.

Post hoc Test

Multiple Comparisons				
Games-Howell				
(Dunn & Stevenson)	(Dunn & Stevenson)			
Learning Style	Learning Style	Mean Difference (I-J)	Std. Error	Sig.
Independent	Participative	.50231*	.12372	.003
	Collaborative	.32880	.12632	.095
	Competitive	.37188*	.10812	.017
	Dependent	.33951*	.10769	.033

Note. * shows that the mean difference is significant at the 0.05 level.

Individuals with independent learning styles outperformed in the VST attention control test. Interestingly, looking at the mean the participative style indicates the poorest performance on the attention control test (See Table 6).

Table 6.

Descriptive Statistics of Styles on Attentional Control Tes

Descriptive				
	<i>N</i>	Mean	<i>Std. Deviation</i>	<i>Std. Error</i>
Participative	20	2.8761	.34962	.07818
Collaborative	18	2.0496	.34888	.08223
Competitive	18	2.0065	.21189	.04994
Dependent	22	2.0389	.22992	.04902
Independent	16	1.9784	.38356	.09589
Total	94	2.0579	.34130	.03520

5. Discussion

The objective of the current study was to explore the most dominant language learning style and the differences in attention control of Iranian advanced EFL learners. The findings revealed that Iranian learners' styles are ranked as the independent, collaborative, dependent, competitive, and participative styles, respectively, while the Avoidant language learning style was not found in EFL learners' preferences. In other words, the most preferred language learning style among Iranian EFL learners was Independent and Participative was the least frequent one. Therefore, they desire to make decisions and do things individually and they have less tendency to collaborate and compete with others. Such a preference toward independent learning can be traced to the educational system of Iran that fosters individual study rather than collaboration and participation since as Huseynpur and Sadeghoghli (2015) asserted individual work is the most common learning practice in the Iranian learning context.

In terms of attentional control, the results also indicated that there was a significant difference in VST performance in Iranian advanced EFL learners with various language learning styles, and independent-style-dominant learners outperformed on the attentional control test. One can speculate that the higher attention control among independent is the result of years of practicing individual works at school or university. As discussed, this is because in individual work, the factors that can distract attention are not present and learners put more concentration on the task which over years can foster their ability to hinder the upcoming distraction which can consequently result in better attention control.

There has been some evidence of the benefits of an independent learning style for the students, including progressed educational execution, higher motivation, higher self-

esteem, better knowledge of their limitations, and better abilities, that helps instructors to design specific activities for learners in the classroom (Meyer et al., 2008).

In contrast to our study, Amira and Jelas (2010) found that females' scores in collaborative, dependent, participative, and competitive styles were considerably higher. Also, interestingly, our findings are not consistent with some previous research seeking students' learning styles using Grasha-Riechmann's questionnaire. For instance, Azarkhordad and Mehdinezhad (2016) investigated 274 students' learning styles. They found dependent style as the dominant learning style among females. Additionally, our results contradict a study by Baneshi et al. (2014) that found female students learning styles were cooperative, participative, and dependent. İlçin et al. (2018) examined the learning styles of Turkish physiotherapy students using the Grasha-Riechmann Student Learning Style Scales and tried to find the potential association between academic performance and learning style subscale scores. The result revealed collaborative style as the most common style among Turkish students and participants' learning style was associated with significantly higher academic performance.

Hamidah et al. (2009) observed that females preferred learning styles are collaborative, participative, competitive, and dependent. Mahamod et al. (2010) also found that females prefer collaborative, dependent, and participative styles more than males do, by contrast, males' scores are higher in the dependent, avoidant and competitive styles. The findings of this study are not parallel with the study carried out by Brahim and Ramli (2010) that found the kinesthetic style as the most opted language learning style. Riazi and Mansoorian (2008) also investigated Iranian EFL learners' preferred language learning styles. The findings showed that learners selected the auditory, visual, tactile, and 61 kinesthetic learning styles as the main styles, and they preferred the singular and class learning styles as their inferior styles.

6. Conclusion

In sum, regarding the role of cognitive language learning styles, various research has indicated that some of these language learning styles have a significant role in learning a language. Thus, it is significant for instructors to distinguish their students' learning styles and provide the training environment based on the students' style of learning (Celce-Murcia & McIntosh, 1991). Learning style, like other human characteristics, can change or

be reinforced based on the educational procedures and context (Grasha, 1996). Learners' learning style is one of the variables that require discussion when studying learners' performance. The findings of this study indicated the significance of identifying learners' learning styles and that varieties exist among learners from various attention levels. The study offers that it's a good idea to inform learners about their learning style priorities or at least the teachers can clarify for them that such a thing (style preference) exists. Such clarification can help them to understand that the speed with which they digest linguistic items or do the tasks in the classroom is not necessarily related to learning deficits or cognitive advantage but to their learning styles. The results are helpful for EFL instructors to improve learning outcomes and consider cognitive and affective factors that are vitally significant in the learning process. That is, instructors should explore ways to improve students' noticing in language classes to enhance Iranian EFL students' L2 success.

Generally speaking, attention is decisive for comprehending second and foreign language learning. What takes place within the attentional region primarily identifies the course of language enhancement, including the development of information (constitution of new displays) and the enhancement of fluency (availability to those displays). Proof carries on acquiring that noticing has a powerful influence on second and foreign language learning. Distinct differences are a significant segment of the story, and both tendencies and capabilities impact who notices what (Bigelow et al., cited in Schmidt, 2010). These have highly started to be found out, but this is an encouraging area for future study, which could also productively include a study program to determine the ways that students' internal variables such as language learning styles differ in terms of noticing.

The findings of this survey can assist EFL instructors to enhance the learners' learning achievements since they should pay attention to cognitive factors along with learning styles in designing tasks and explore ways to improve students' noticing in language classes. Additionally, it is significant for ESL/EFL teachers to abet their learners to utilize more suitable language learning styles, particularly those found in the literature. In providing instructing contents and plans, consideration should be paid to learning styles and attention level and a wide span of instructing methods should be applied so that the various learning priorities are purveyed for. When organizing curriculums, it is reasonable to identify the learners' learning styles and their attention levels. Thus, it seems significant

for an instructor to be informed of the students' preferences of language learning styles in terms of attention to provide students' consent and gain in educational contexts.

This research suffers from several limitations notably related to sample size. The participants were limited to learners at the private language institutes in Kermanshah, Iran. Therefore, further study is required to be done at schools or university levels to contrast the findings. The results, due to the difference between various learning styles in terms of attention control were determined by the Grasha-Richmann student learning styles scale and the computerized Victoria version of the Stroop color-word test. Using other instruments such as interviews could give a more complete outcome.

Future research is envisaged to collect the data from a larger number of learners in an experimental design, rather than in a mere quantitative design, to increase generalizability. The present research was carried out with EFL students at the advanced level. Learners at other levels, elementary and intermediate, were not studied in the current study. It is suggested that other surveys be carried out with lower levels, as well. Moreover, the study was done on the relation between the factors of attention control and language learning styles, and the learners' gender and age might assist the training system to perform more effectively. Another aspect to study stands in the relationship between attention control and language learning strategies. Further surveys can be run in the domains of language learning strategies, attention control, and the relationship between the two. Finally, future surveys can extend the findings of the present research by assuming other mediating factors. These recommendations need precious long analysis in the future.

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