

COGNITIVE STYLE AND EFL LEARNERS' LISTENING COMPREHENSION ABILITY

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Abstract: The current study aimed to investigate whether, and to what extent, there is a relationship between field independence/dependence cognitive styles and Iranian EFL learners' listening comprehension ability. For this purpose, a sample population of 131 Subjects was randomly selected. A battery of tests including: a) the Group Embedded Figures Test (1971), b) the TOFEL listening test (1995), c) the listening task preference questionnaire, and d) the Michigan ECPE test (1996) were administered. The data analysis showed that the correlation between the TOFEL and the GEFT scores for FD learners (both males and females) was significant ($r = 0.70$), and higher scores on the GEFT led to an increase in the FD learners TOFEL scores. Conducting one-way and two-way ANOVAs, it was suggested that while there was a relationship between cognitive style and listening comprehension ($F = 18.02$) and also no relationship between sex and listening comprehension ($F = 0.267$), the interactional effect was significant ($f = 7.03$). Therefore, sex can be regarded as a source of performance difference in listening comprehension but not by itself and it seems that the interaction of sex and cognitive style can have a stronger effect on this skill. Regarding the learners' preference toward the different parts of the TOEFL listening section, most learners favored the short conversations, informal assessment, and one item/one conversation however, the FI ones did better on the longer conversations of the second and the third parts of the TOEFL Listening test.

Keywords: Cognitive style, Field dependence, Field independence, Listening Comprehension

The success in learning is the most significant issue in the realm of language learning. While it is true that different people enjoying different faculties can master their mother tongue, they do not enjoy the same success when learning a foreign language. This is somehow because learning a foreign language is affected by both teaching and learning factors. In recent years, foreign language researchers have attempted to isolate these factors and determine their influence in enhancing or hindering progress in learning another language. Since the focus of attention has recently shifted from teachers to students, one of the most significant factors is meeting the students' needs. These needs can be specific to the classroom or be affected by the classroom experiences. The greatest of these needs in and outside the classroom is learning. Learning does not solely involve receiving information, doing activities, correcting errors and etc. It necessitates a suitable learning environment which encourages positive motivation and causes the learners to do their best in getting the maximum achievement. Thus, it is the student who causes learning to take place, and teachers and methods of instruction play an indirect role in the process of learning.

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Cognitive psychologists and educators have long been interested in understanding the individual differences in cognition and their impact on learning and instruction (Altun & Cakan, 2006). There have been proposed various factors explaining different levels of learning for foreign language learners, among which age, sex, motivation, anxiety, social needs, language aptitude, learning strategies, and cognitive styles can be referred. Being so, this study is going to deal with one the most examined ones, the one concerned with the individual's perspective about a problem, i.e. cognitive style. According to Chastain, (1988, p. 125), "the term cognitive style refers to the predispositions individuals have for using their intellect in specific ways to learn". Style refers to individual's consistent preferences in learning situations which differentiates him/her from someone else.

The cognitive style which has received the greatest attention in second/foreign language researches is Field Independence / Dependence (henceforth FI/FD). Zhang (2004) defined FI/FD 'as a reflection of the extent to which an individual uses external or internal cues for conduct organization. FI/FD is typically referred to as a variable of cognitive style - a pervasive, stable, and bipolar characteristic affecting the process of perception, thinking, and problem solving (Witkin, Moore, Goodenough and Cox, 1977). FI addresses the degree to which an individual focuses on some aspect of experience and separates it from its background (the word 'field' is used for this kind of background). An FI person perceives analytically, analyzes and isolates relevant details, detects patterns, and critically evaluates data; while an FD one perceives holistically, tends to get lost in the stimuli and is unable to distinguish salient points. FI/FD describes two contrasting ways of processing information along a continuum from extreme field-dependence to extreme field-independence. FI subjects trust internal cues, and this is associated with a greater aptitude for restructuring, i.e. for imposing organization on received information. FD subjects, on the other hand, place their trust in external cues, and tend to accept percents of symbolic representations at face value", (Tinajero & Paramo, 1997, p. 199).

Daniels (1996) summarizes the general tendencies of field dependent and independent learners as follows:

Field-dependents:"

- Rely on the surrounding perceptual field.
- Have difficulty attending to, extracting, and using non salient cues.
- Have difficulty providing structure to ambiguous information.
- Have difficulty restructuring new information and forging links with prior knowledge.
- Have difficulty retrieving information from long-term memory.

While, field-independents:

- Perceive objects as separate from the field.
- Can dissembled relevant items from non-relevant items within the field.
- Provide structure when it is not inherent in the presented information.
- Reorganize information to provide a context for prior knowledge.
- Tend to be more efficient at retrieving items from memory." (p. 38)

It has been suggested that FI/FD has important educational implications; and although "the greater restructuring ability of FI subjects is counterbalanced by the greater social skills of FD subjects, it has frequently been demonstrated that FI subjects perform better than FD subjects

on many intellectual tasks, brining the assumption of neutrality into doubt and giving rise to a long-running debate", (ibid, p. 200).

According to Chapelle (1988), early research indicated relationships between FI and tests of some relatively discrete skills such as imitation (Naiman, Frohlich and Stern, 1975), sentence disambiguation (Seliger, 1977 in Chapelle, 1986), and tests of reading, writing, and listening (Bialystok and Frohlich, 1978). Regarding these results, FI students were thought to be good at the kind of analytic skills needed for classroom language learning and discrete point tests, but the more integrative the test, the less their ability (Brown, 1987). However, recent research showed that FI style was also predictive of performance on 'communicative' and 'integrative' measures (Hansen and Stansfield, 1981) and on cloze, dictation, and test of spoken communicative competence (Chapelle and Roberts, 1 986).

In 1967, Witkin, Goodenough , and Karp have indicated that FI individuals tended to do better in engineering , sciences, and mathematics – fields requiring high analytic ability , whereas FD individuals tended to do better in counseling, social sciences, teaching and other people-oriented professions. The relationship of FI/FD with sex was also examined by Witkin & Beery (1975), and it was suggested that boys were usually more field dependent than girls. Hansen & Stansfield (1981) have also reported that FI learners had slight advantages for communicative tasks, greater advantages for academic tasks, and greater for the combined tasks. In another study Hansen (1984) noted that field independent learners achieved better scores on cloze test. However, since then, Bacon (1987 in Cook, 1991) found no difference between field dependent and field independent students in terms of how much they spoke and how well they spoke (Cook.1991).

In a research study, Dwyer and Moore (1995) investigated the effect of cognitive style on achievement with 179 students in the United States. They found the field independent learners to be superior to field dependent learners on tests measuring different educational objectives and concluded that cognitive style had a significant association with students' academic achievement. In 1997, Tinajero & Paramo examined the relationship between FI/FD cognitive style and academic achievement and indicated that FI boys and girls performed better than FD ones in all the subjects considered. In another study, Murphy, Casey, Day, & Young (1997) tried to determine the relationship between academic achievement and cognitive style of 63 undergraduate Canadian students in information management program. They found that field independent students performed better than field dependent ones only on one of the technical courses. However, the two groups performed similarly for the other courses. Altun (2003) also investigated the relationship between attitudes toward computers and cognitive styles with 67 undergraduate university students. The results indicated small correlations (between $r = -.006$ and $r = .309$) between these variables.

Alomyan and Au (2004) investigated the effect of students' cognitive styles, achievement motivation, prior knowledge, and attitudes on achievement in a web-based environment with undergraduate university students. They found no differences between students' attitudes toward web-based learning and their cognitive style. Guisande, Pramo, Tinajero, and Almeida (2007) examined whether children with different FD/FI cognitive styles show different performance of tasks of attentional functioning. 149 children were classified according to cognitive style, storage capacity, verbal working memory, capacity to focus, shift, and maintain attention, and capacity for sustained attention. They found that FI children displayed better performance than FD children on all tests except the Digits Forward Test.

Regarding that the research so far has not been conclusive on the central issues of FI/FD cognitive style, the need for its further investigation is an important issue to be considered here. Since, FI/FD describes two contrasting ways of processing information based on the individuals' ability to abstract an element from its context or background field, and according to Nunan (1999, p. 200), listening comprehension requires the active construction of the original meaning of the speaker using incoming sounds as clues while at the same time using prior knowledge of the context and situation within which the listening takes place, it seems that the learners' cognitive style might have an effect on their listening comprehension ability. As far as the researcher has investigated, no results were also reported concerning the relationship between FI/FD cognitive style and learners' listening comprehension ability, thus, it was decided to deal with this issue here. Since two processes (top-down and bottom-up) are involved in the listening comprehension and it is suggested that listening comprehension is more a top-down processing (Brownell, J. 1995, p. 197), the researcher tends to find out whether, and to what extent, there is a relationship between FI/FD cognitive style and the Iranian foreign language learners' listening comprehension ability. It should be noted that having FI cognitive style might facilitate learning language skills in which analytical processing is more dominant.

Another important issue concerning the role of cognitive style in instructional setting is whether there is any difference between FI and FD learners regarding their preference toward the kind of listening task they are dealing with. Does a matching of learner preference and instructional task affect learning performance? There have been some studies about the effects of matching and mismatching student learning styles and cognitive styles with instructional treatments in management (Entwistle, 1988; Hayes & Allinson, 1996), but little has been done concerning language learning. Therefore, there were several purposes for this study. The first was to determine the relationship between FI/FD cognitive styles and EFL learners' listening comprehension ability which can have important pedagogical implications for instruction. A second purpose was to investigate whether the combination of sex and FI/FD cognitive style would have any interactional effect on the learners' listening ability. Meanwhile, it was the researcher's concern to explore whether there was any difference between the FI and FD learners with regard to their preference toward the kind of listening task they were performing.

With regard to the nature of this study, the researcher has formulated two null hypotheses which will be tested at 0.05 level of significance. 1) H₀: There is no relationship between FI/FD cognitive styles and EFL learners' listening comprehension ability, and 2) H₀: The combination of sex and FI/FD cognitive styles will have no interactional effect on the learners' listening skill.

METHODOLOGY

Sample

For the purpose of this study and in an attempt to test the hypotheses, 277 students (119 males and 158 females) majoring English in the Islamic Azad University (Mashhad and Quchan) and Ferdowsi University were administered the GEFT, the TOFEL listening section, and the Michigan ECPE, out of whom 131 learners (male and female) were selected as the intermediate ones. The selection of the learners was based on their marks on the Michigan test and those with scores between 0.5 standard deviation below and above the mean were considered as intermediate ones. It must be mentioned that since in listening comprehension the students must possess a threshold of language in order to be able to cope with the TOFEL Test, the elementary

learners were ignored in this study. Thus, the learners were firstly divided to male (66) and female (65) groups, and then, these were again divided to male FI learners (32), male FD learners (34), female FI learners (33), and female FD learners (32).

Instrumentation

The Following instruments were used in this study:

1. The Group Embedded Figures test (GEFT) developed by Oltman, Raskin, and Witkin in 1971: This test was used to evaluate the degree of FI/FD cognitive styles of the student. It comprised 18 sheets divided into three sections; the first section comprised sheets bearing seven complex geometric designs each of which incorporated one of the simple figures represents on the last page. This section took 2 minutes and was used for practice before starting the other two main sections. The second and the third sections each comprised five sheets bearing nine complex geometric designs which incorporated one of simple figures, both taking ten minutes altogether. The subjects were presented with these three sections and the corresponding simple figures which had to be located in the complex designs as quickly as possible. Test score was eighteen which was the total number of the simple figures correctly located in complex ones.
2. The Michigan ECPE Test (Oxford University Press, 1996): This test was used to evaluate the learners' language proficiency in order to select the intermediate subjects. It comprised 14 sheets including 140 items taking 85 minutes altogether. This test was divided in to four sections: the cloze section, consisting of two separate cloze passages which contained 40 items; the grammar section consisting of 40 multiple-choice questions; the vocabulary section including 40 multiple-choice vocabulary questions ;and the reading section containing four reading passages including 20 items. The total score of the ECPE test was 140, devoting one point to each correct answer. There was no penalty for guessing.
3. The TOFEL Listening Test Form OBTF05 (Educational Testing Service, 1995): This test was used to evaluate the learners' listening comprehension ability. The test comprises 10 sheets including 50 questions taking 35 minutes altogether. The subjects get a point for each correct answer in this test, regarding the total score of the test as 50.
4. A researcher-made questionnaire to determine EFL FI/ FD learners' preference regarding different parts of the TOEFL listening test. It included ten questions concerning the learners' attitude toward formal/informal assessment, short /long conversations, two/several people conversations, multiple-choice/fill-in-the-blank items, and one item-one conversation/several items-one conversation tasks.

Design and Procedure

In this study, there was no treatment and no control over what had already happened to the subjects. Thus, the design of the study would be ex post facto. First, all the learners were administered The GEFT and The Michigan ECPE Test. The intermediate students chosen for this study were regarded as enjoying the same knowledge of English whose listening comprehension ability was supposed to be evaluated. They were selected based on considering just the subjects who had the scores between 0.5 standard deviation below the mean and 0.5 standard deviation above the mean (i.e. 40-63). These learners were divided to FI and FD learners based on the GEFT score (regarding those with scores from 0 to 11 as FD subjects, and those with scores 12

to 18 as FI ones). Therefore, 131 subjects were selected and divided to two groups of male and female learners. These learners answered The TOEFL Listening Test and The Learners' Listening Task Preference Questionnaire. The data on these tests were gathered and put in to analysis in order to answer the research questions.

Data Analysis

The data were analyzed based on the following analyses:

In order to determine the relationship between cognitive style and listening comprehension, the scatter diagram of the two variables was firstly drawn, and the strength of this linear relationship was determined by the Pearson Product Moment Coefficient. The correlation was also computed between TOFEL and GEFT for all the subjects: FD boys, FD girls, FI boys, and FI girls separately which are shown in Table 1.

Table 1

Variable	<u>GEFT</u> (all)	<u>GEFT</u> (Boys)	<u>GEFT</u> (Girls)	<u>GEFT</u> (FI)	<u>GEFT</u> (FD)	<u>GEFT</u> (FD/B)	<u>GEFT</u> (FD/G)	<u>GEFT</u> (FI/B)	<u>GEFT</u> (FI/G)
TOFEL	0.49	0.50	0.53	0.04	0.70	0.62	0.83	-0.01	0.01

The correlation between the TOFEL scores and sex, which was computed by using the Point Biserial Correlation, was 0.045. To understand the effect of cognitive style on the learners' listening comprehension and the effect of sex on listening skill and the effect of the combination of cognitive style and sex, one-way and two-way ANOVAs were conducted whose results are summarized in table 2 .

Table .2

Source	SS	d.f.	MS	F
cognitive Style (A)	985.59	1	985.59	18.02**
Sex (B)	16.63	1	16.63	0.267
A. B	-437.7	1	-437.7	-7.03**
Within groups	7896.86	127	62.18	
Total	7458	130	57.36	

It should be mentioned that SS refers to the sum of squares. By dividing each SS by its degree of freedom (d.f.), the variance attributed to each factor (A, B, A.B) was obtained. This variance is called mean square (MS). By dividing the mean square between groups by the mean square within groups, the F-ratio can be achieved (last column). At last the descriptive statistics for the GEFT and language Measures (TOFEL, Michigan) were computed.

FINDINGS DISCUSSION

The aim of this work was to investigate the relationship between FI/FD and learners' listening comprehension. According to the first null hypothesis, the researcher expected that $h_0: r = 0$ which identifies no relationship between the two variables. As it was shown, for all the selected subjects who took both the GEFT and the TOEFL, $r = 0.49$. Considering ($*p < 0.05$) and ($N = 131$), the critical value of r is ($r_{crit.} = 0.1946$).

Thus, since ($0.49 > 0.19$), the first null hypothesis was rejected and the existence of a relationship between FI/FD and listening skill was accepted. But since ($r^2 = 0.24$), we see that the variation in the GEFT scores accounts for about 24 percent of the variation among listening scores in the hypothetical study and this is less than half which means that the relationship is weak. Yet, it is still interesting and somehow meaningful that one simple variable (cognitive style) seems to explain at least some of the other variable (listening comprehension). So, the correlation between the two variables was computed for each group separately whose significance and meaningfulness are shown in Table 3.

Table 3:

Variables	N	R	robs. vs. rcrit.	Interpretation
GEFT(all).TOEFL	131	0.49	$0.49 > 0.19^*$	Weak Relationship
GEFT(FI).TOEFL	65	0.04	$0.04 < 0.25 \& 0.23$	Relationship No
GEFT(FD).TOEFL	66	0.70	$0.70 > 0.25 \& 0.23^*$	Relationship Weak
GEFT(boys).TOEFL	66	0.50	$0.50 > 0.25 \& 0.23^*$	Relationship Weak
GEFT(girls).TOEFL	65	0.53	$0.53 > 0.25 \& 0.23^*$	relationship Weak
GEFT(FI/B).TOEFL	32	-0.01	$-0.01 < 0.34$	Relationship No
GEFT(FI/G).TOEFL	33	0.01	$0.01 < 0.34 \& 0.32$	Relationship No
GEFT(FD/B).TOEFL	34	0.62	$0.62 > 0.34 \& 0.32^*$	Weak Relationship
GEFT(FD/G).TOEFL	32	0.83	$0.83 > 0.34^*$	Moderate Relationship

$H_0: r = 0, *p < 0.05, df = N - 2$

With regard to this table, it can be said that the relationship between cognitive style and listening comprehension is seen more in FD learners, and FI ones showed no relationship between these variables. Regarding the last rows of the table, it is observed that the moderate relationship between GEFT and TOEFL shows a difference between FD girls and FD boys. With regards to sex and listening comprehension, we see that ($r = 0.045$) is much less than ($F_{crit.} = 3.92$), which implies that there exists no relationship between these variables. This was also proved by conducting one-way ANOVA for these variables. This analysis showed that $f_{obs} = 0.267$ is much less than $F_{crit.} = 3.92$, and therefore, the researcher accepted that sex had no effect on listening comprehension. The existence of a relationship between cognitive style and listening comprehension was also proved by conducting one-way ANOVA. Here, it is observed that ($F_{obs.} = 18.02$) is much greater than ($f_{crit.} = 3.92$). So, (The null hypothesis was rejected and the existence of the relationship between the two variables was strongly proved.

Concerning the interactional effect of cognitive style and sex on listening comprehension, since ($F_{obs.} = -7.03$) and ($f_{crit.} = 2.68$), it is suggested that the interaction was significant; and this meant that while cognitive style had an effect on learners' listening comprehension, this

might somehow be due to the second factor (sex). The negative mark of the F-ratio shows a negative direction and has no numerical value. Thus, the second null hypothesis was also rejected, and the existence of an interactional effect of cognitive style and sex on listening was proved.

The first interesting result is that the relationship between FI/FD cognitive styles and listening skill was observed, and it was shown that this effect is mostly apparent in FD learners, suggesting FI to have no relationship with listening. It was also observed that FD cognitive style has somehow a facilitative effect on learners' listening ability, which is in accordance with the results of the other studies, too. This was predicted first based on the magnitude of r ($r_{FD} = 0.70$) and its positive direction which was also shown in its scatter diagram implying that as the scores on the GEFT increase so do the scores on the TOFEL listening test. Thus, it is suggested that cognitive style can be a source of differential success concerning listening comprehension. The second interesting result is that sex has no relationship with the learners' listening ability, and although a slight difference is observed between FD boys' performance and FD girls' performance, it is not enough to show any relationship between the two variables.

The third interesting result is that the combination of sex and cognitive style can have significant interactional effect on the learners' listening comprehension ability. Since the interactional effect is significant, it washes out the main effect; in other words, the researcher cannot suggest stronger claims about the effect of cognitive styles (independent variable) and sex (moderator variable) on listening comprehension (dependent variable). Thus, sex can be regarded as a source of performance difference in listening comprehension but not by itself and it seems that the interaction of sex and cognitive style can have a stronger effect on this skill.

Regarding the learners' preference toward the different parts of the TOEFL listening test, most learners favored the short conversations, informal assessment, two people conversations, multiple-choice items, and one item/one conversation tasks, however, the FI ones did better on the longer conversations of the second and the third parts. This can be to some degree the result of their stronger analytical ability which has been shown in many other researches, too.

Accordingly, the results provided the researcher with the conclusion that there is a statistically significant difference between FD and FI learners' performance on listening tests, with the FD style showing a relatively facilitative effect on this skill. Implications for both teaching and further research can be drawn from this study. The finding that FD style has a moderate relationship with listening comprehension, and also that this effect is somehow facilitative, suggests that more emphasis should be put on the matching between students' cognitive style and the ways of teaching and assessing listening comprehension in order to ensure a higher degree of success in both language learning and teaching domains. This can be done by matching the kind of listening task with the cognitive style of the learners. Of course, the provision of appropriate task to ensure all listeners' maximum performance requires further research to be conducted.

With regard to what J. Brownell (1995) suggests about factors influencing listening which includes sex and learner's style, and also the fact that the interaction of sex and cognitive style can have relatively strong effect on the learners' listening comprehension ability, it can be suggested that teachers, material writers, and curriculum designers can take benefit from the findings of this study, and make better decisions about what kind of texts and tasks are more suitable for FI male / FI female and FD male/ FD female learners. Accordingly, it is possible to

guarantee the eventual attainment of the desired educational goals concerning listening skill by satisfying the cognitive needs of the students.

CONCLUSION

There are some limitations need to be considered in interpreting the findings of this study. First, this study included only the Iranian EFL learners. A more comprehensive study including other nationalities and/or SL learners will contribute to our understanding of the relationship between cognitive styles and listening comprehension ability. It is possible that a different type of listening test would yield different results. Secondly, as with any scientific finding, replication is needed in different settings with diverse populations to increase the external validity. It also needs to be emphasized that this study used only Witkin et. al.'s (1971) FD/FI as an indicator of cognitive style. Other cognitive style inventories could be applied to explore the interrelationship between listening skill and cognitive style in a broader context. Finally, this study only included some data about participants' self-preference about different parts on the TOEFL listening test. Therefore, this study can be extended to further explore the associations between cognitive style and learners' attitudes from a qualitative paradigm concerning other tasks used for assessing listening.

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