Revising Linkage between Field Dependence-Independence Cognitive Styles with Iranian EFL Learners' Global-Local Reading Comprehension

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ABSTRACT

Despite vast research, there has not been a comprehensive consensus over the impact of the Field-Dependence/Independence (FD/I) cognitive styles on learning of language skills (Ellis, 2015). The present study, therefore, aims to investigate the linkage between FD/I cognitive styles with EFL learners' global and local reading comprehension. To this end, a total of 180 female and male intermediate EFL learners, aged from 16 to 20, at Iranian Language Institute in Khoram Abad, Iran were selected using stratified random sampling. After measuring the learners' FD/FI degrees with use of the Group Embedded Figures Test (GEFT), the participants were divided into two groups, namely FD and FI. Next, the participants took a reading comprehension test that included both local and global reading comprehension items. To analyze the collected data, Pearson Correlation test was run. The findings revealed that there is a statistically significant correlation between FD cognitive style and global reading comprehension performance. In addition, the results indicated that there exists a statistically significant linkage between FI cognitive style and local reading comprehension ability. The findings may suggest that EFL teachers should take test takers' cognitive styles into consideration as a key source of systematic variance in reading performance.

1. Introduction

How to get success in second language learning, in general and factors affecting language learning processes and performance in language tests, in particular have been widely explored and discussed in the literature by researchers in order to provide effective guidelines for teachers and learners in second language learning settings (Ellis, 2008). The enormous complexity and variety of the variables engaged in the development of second/foreign language learning and test performance have been extensively discussed in-depth in the literature of Second Language Acquisition (SLA) (Bachman, 1990; Dörnyei, 2005). In an early attempt, Chastain (1988) identified four sets of variables as learner variables that involved in the language learning, including affective variables (self-concept, perseverance, etc.); cognitive variables (cognitive styles, learning skills, etc.); social variables (social context, language and culture shock); and biological variables (gender and age). Furthermore, in communicative language ability, according to Backman (1990), these factors should be considered as potential sources of errors since they can decrease the reliability of test scores and the validity of their interpretation. Of the mentioned factors, indeed, there are some traits of test takers that are not related to the language ability and we are not going to measure such as cognitive styles. These

factors should be taken into account by language teachers and test developers because they can influence and interfere with the learners' reading comprehension process and performance on different tests.

In simple terms, cognitive styles can be defined as "information processing habits representing the learner's typical mode of perceiving, thinking, problem solving, and remembering" (Messick 1984, p. 61). Cognitive styles refer to the stable and pervasive ways in which people process information. This manifests itself in activities in specific contexts and; thus, is interwoven with other affective, physiological, and behavioral factors. Several different cognitive styles are often referred to in Applied Linguistic texts such as field dependence/independence; inductive/deductive learning; synthetic/analytic; reflective/impulsive; tolerance of ambiguity; left/right-brain; visual, auditory, and kinesthetic (Brown, 2015). In the current study the focus is on field dependence/independence cognitive styles.

FD/I cognitive styles have been widely studied in the literature. In fact, the FD/I describe two contrasting ways of information processing. Individuals can be positioned along a continuum running from extreme FD to extreme FI. As Brown (2015) pointed out, FD refers to ability to perceive a particular and relevant item in a field of distracting items. In general psychological terms, that field may be perceptual or it may be more abstract and refer to a set of thoughts, ideas, or feelings from which your task is to perceive specific relevant subsets (Dörnyei, 2005). In contrast, FI style can enable an individual to distinguish parts from a whole, to concentrate on something, or to analyze separate variables without the contamination of neighboring variables. In other words, those individuals located toward the FD end of the continuum have difficulty in separating information from its contextual surroundings whereas FI individuals have less difficulty in accomplishing the same task (Guisande, Paramo, Tinajero & Almeida, 2007). It is worthy to note that FD/I cognitive styles are commonly measured by Group Embedded Figures Test (GEFT), designed and developed by Witkin, Dyk, Faterson, and Goodenough (1971). Put it simply, when taking the test, the test takers are required to outline a simple form in the larger complex figure.

Concerning the reading comprehension ability, during the past decades, with the emphasis on communicative language competence in teaching and testing, especial attention has been given to reading comprehension ability as a very influential skill to get success in learning of foreign languages (Schmitt, 2012). For most EFL learners, sometimes developing reading comprehension skill is considered as the most important component of learning compared to other skills. In many EFL learning contexts, in actuality, learners have very little or no accessibility to native speakers or enough comprehensible listening input. They have only access to books, journals, periodicals and other reading materials to gain the input they need.

Regarding the significance of reading comprehension skill in L2 classes, Chastain (1988) pointed out that all types of authentic comprehensible text can be used in order to help learners to develop a sufficient language base from which they can create massages they want to share with others. In addition, Schmitt (2012) considered reading as a communicative activity and maintains that the communication takes place between the writer encoding some messages and the readers decoding the messages through both top-down and bottom-up models for comprehending the message. Because of the significance of reading comprehension ability in EFL settings for language practitioners, test-developers, and language learners, a number of studies have been conducted. However, for the lack of comprehensive consensus over the possible linkage between FD/I cognitive styles and global and local reading comprehension ability, the present study tries to cast light on their relationship and how it can be a predictive trait on reading comprehension test results.

2. Review of Related Literature

Many studies have been conducted to investigate the influence of FD/FI cognitive styles on second language acquisition. These studies have revealed some interesting points regarding FI/FD learners and their differences in acquiring language skills and components. It seems that, according to Brown (2014), FI cognitive style correlates much more positively and significantly with getting success in second language performance. However, FD cognitive style may not be necessarily disadvantageous, because FD-oriented individuals can perform better in social aspects of language

learning (Dörnyei, 2005; Salmani-Nodushan, 2006).

In a study, Blanton (2004) explored the impact of FD/I cognitive styles on standardized reading tests. She found that FD cognitive style had more impact on students' performance and type of the tasks used in the test had a profound effect on the performance of the FD-oriented students. She concluded that FD-oriented students performed better when the reading tests were multiple-choice un-timed compared to the other kinds of tests. In fact, this type of reading test could provide more accurate estimation of their reading comprehension skills and could decrease differences in test performance among FD and FI students.

Moreover, Salmani-Nodoushan (2007) examined the relationship between FD/I cognitive styles and EFL learners' reading performance. Based on the results, cognitive styles had the strongest effect on test performance when test takers were most proficient. The results also revealed that success with more holistic or more analytic reading tasks correlated with FD/I cognitive styles. In fact, scores on holistic tasks correlated positively with FD style and negatively with FI styles. By contrast, scores on analytic tasks correlated positively with FI style and negatively with FD style.

In another study, the relationship between FD/FI cognitive styles and listening comprehension ability was explored by Khodadady and Zeynaly (2012). Participants were 200 (152 female and 48 male) English students enrolled in universities and responded to the GEFT as well as IELTS listening comprehension test. They were divided into FD/I groups according to the scores gained in the GEFT. The results suggested that test-takers' cognitive styles can influence their listening and task performance. The FI participants outperformed the FD participants on the IELTS listening comprehension test. The finding also indicated that field-independency correlates more positively with test-takers successes in IELTS listening comprehension compared to field-dependent ones. More specifically, field-independency correlated more significantly with fill-in-the-gap questions, i.e., form-completion, note-completion and sentence-completion tasks compared to the FD test-takers.

Finally, Amiry and Mall-Amiri (2015) tried to reveal the relationship between FI, Reflectivity/Impulsivity, and reading comprehension ability among the Iranian EFL learners. Results indicated that there was a statistically significant relationship between FI and reading comprehension, and there was also a statistically significant relationship between reflectivity and reading Comprehension. Furthermore, it was found out that both FI and reflectivity styles could significantly predict the reading comprehension ability of the EFL learners.

As mentioned above, although a great deal of research has been done on the linkage of FI/FD cognitive styles with second language learning, there has not been a comprehensive consensus in SLA literature. In other words, there has been a paucity of research on the relationship of FD/FI cognitive styles on sub-components of reading comprehension ability including global and local questions. Thus, the present study aims to fill up the lacuna by shedding light on the correlation between FD/FI cognitive styles with global and local reading comprehension tasks in the Iranian ELF learners. To this end, this study aims at answering the following research questions:

1. Is there any statistically significant correlation between FD and EFL learners' performance on local reading comprehension questions?
2. Is there any statistically significant relationship between FI and EFL learners' performance on global reading comprehension questions?

3. Methodology
3.1 Participants and Settings

In order to carry out the present study, a total of 180 female and male intermediate EFL learners, aged from 16 to 20, at Iran Language Institute in Khoram Abad, Iran were selected using stratified random sampling method. The learners have been learning English as a foreign language three sessions a week. In their classes, four skills were covered and it was claimed that the classes were run according to communicative language teaching principles. It should be noted that homogeneity of the participants were assured by administrating KET test. The reason to have a homogenized group was to control the effects of the differences in the performance due to different proficiency levels. In other words, proficiency level was controlled to just observe the effects of FD/I cognitive styles. To find the homogenized groups, the mean score of all those taking the tests was calculated and those

participants whose scores fell 1 SD below and 1 SD above the mean were selected.

3.2 Instruments

To gather the required data, the following instruments were used. As stated earlier, in order to determine the homogeneity of the participants; that is, to make sure they are, to some extent, at the same level of proficiency, KET's reading and writing samples were employed as a screening test to measure the participants' English proficiency. The reading component of the test includes five parts with 40 multiple-choice items providing simple written material such as signs, brochures, newspapers, and magazines. The writing section, on the other hand, consists of three parts: 5 items on word completion and writing a letter about a number of topics consisting of 100 words. In order to examine the reliability and validity of the KET test, it was piloted on a sample of 20 students who were at the second grade at 'Bahar' Language Institute in Khoramabad. The reliability estimated using Cronbach alpha turned out to be 0.79. However, regarding validity, it was examined through experts' judgment. The KET test was given to three well-experienced EFL teachers, who have been teaching English over fifteen years, to examine its face and content validity. Overall, all of the teachers confirmed that the instrument has an acceptable level of face and content validity.

To measure the kinds of the participants' cognitive styles, GEFT was used. It contains complex figures within which simple geometric figures have been embedded. The participants were supposed to figure out and traced the simple geometric shapes within the complex sets. It was assumed that the FI participants could easily locate a large number of simple figures while the FD participants were able to locate just less figures. In fact, GEFT consists of three sections. The first part contain seven items and is given as a practice. Each of the second and third sections consists of 9 complex pictures. The total score for the test takers was accounted by adding up the total number of correctly-traced pictures in the second and third sections. As one point was given to every correct response, the scores in the GEFT may range from 0 to 18.

Concerning the reading comprehension test, it was designed and developed by a panel of well-experienced EFL teachers. Two reading passages with similar readability indices based on the proficiency level of the participants were developed. Accordingly, 30 multiple-choice items including 15 items to measure local reading comprehension ability and 15 items to measure global reading comprehension ability were written. It should be remembered that the test was piloted on a sample of 20 students with similar traits and based on their responses some items were modified, revised and substituted. The estimated reliability through Cronbach's alpha was 0.79 which was acceptable for the purpose of the current study. The test validity was confirmed through expert judgment in which two university professors approved the face and content validity.

3.3 Procedures

The following procedures were undertaken to do the present study. First of all, the KET test was administered to homogenize the participants. Those participants whose scores fell between 1 SD below and 1 SD above the mean score were selected. After a week, the GEFT test was given to the participants in order for measuring their FD/FI cognitive styles. Precisely speaking, the particular figures that the participants were required to identify were given on a separate sheet of paper consisted of the key items to be identified within the larger and more complex figures. The figures from which the embedded ones were to be recognized were not on another sheet of paper, and the participants were not to turn the page to the key item page for every test item. The allotted time were 13 minutes including 3, 5, 5 minutes for the first, second, and third section, in order. As each correct response is awarded by one score, the scores on the GEFT test can range from 0 to 18. Because of the debate on the continuum of field dependency within each individual, those participants who got above 12 on the GEFT were considered as FI learners and those participants whose score fell below 8 were identified as FD learners. After a week, the next stage was administration of the reading comprehension passages containing local and global test items. During 50 minutes, the participants read the passages and answered the follow-up questions.

3.4 Data Analysis

The SPSS version 22 was employed to estimate statistical numbers; that is, mean and standard deviation for both groups of the participants. The Pearson correlational test was used to clarify the kind and amount of correlation between FI degree and local reading comprehension ability, as well as,

FD degree and global reading comprehension ability.

4. Results

In this part the results of the data analysis are reported. As mentioned above, before running the main study, in order to make sure whether KET had the acceptable reliability for the current study, it was administered on a sample of 20 students with the same traits of the participants in the main study at "Bahar English Institute" in Khorram Abad. As shown in Table1, the Mean (M = 24.50) and Standard Deviation (SD = 8.85) were calculated and reported, respectively. Concerning the reliability of the test, it was calculated through Cronbach α (0.79) which was considered acceptable for the purposes of the current study.

Table1: Descriptive Statistics and Reliability Value of the Pilot Study Results for KET

N	Min	Max	M	S. D	Cronbach α
20	11	39	24.50	8.85	0.79

Following the same procedure, to gauge the reliability and validity of the teacher-made reading tests, they were piloted. As shown in Table2, for the FI test, the Mean (M = 15.30) and Standard Deviation (SD = 5.34), for the FD test (M = 16.45) and (SD = 6.11) were calculated and reported, respectively. Regarding the reliability of the test, it was calculated through Cronbach α (FI test = 0.72 and FD test = 0. 82,) which carried a high level of reliability.

Table 2: Descriptive Statistics and Reliability Value of the Pilot Study Results for KET

	N	Min	Max	M	S.D	Cronbach α
FI-test	20	3	19	15.30	5.34	0.72
FD-test	20	5	18	16.45	6.11	0.82

In the next stage, both descriptive and inferential statistics of the obtained data were calculated. To the first aim, M and SD were calculated. As can be seen in the table 3, the calculated M and SD for each group were like this: the students' FI (M = 13.82, SD = 3.18); the students' FD (M = 4.15, SD = 1.71); global reading score of FI (M = 12.37, SD = 2.57); and local reading score of FD (M = 12.63; SD = 3.60).

Table 3: Descriptive Statistics of the Main Data

	N	M	SD
Ss' FI	90	13.80	3.18
Global reading score of FI	90	12.37	2.57
Ss' FD	90	4.15	1.71
Local reading score of FD	90	12.63	3.60

One of the important pre-requirements in doing inferential statistics such as Pearson Correlation Coefficient is the normality of the gathered data which can be checked through Kolmogorov-Smirnov test. The use of this test to check the normality of the data showed that the figures related to Ss' FI with value distribution (1.15) are at a meaningful level (0.14) as well as to Ss' FD (1.08, 0.19); global reading score of FI (1.02, 0.25); local reading score of FD (0.78, 0.58) demonstrating that the data are normal.

As can be seen from table 4, the calculated value of the Pearson Correlation Coefficient for the relationship between FD and local reading comprehension ability is r = 0.66 at α = 0. 05 that is considered meaningful and significant. Thus, with 95 percent confidence it can be said that there exists a strong and meaningful correlation between FD and local reading comprehension ability. That is; the students with a high degree of FD could better answer local reading comprehension items.

Table 4: Pearson Correlation Coefficient for the Relationship between FD and Local Reading Comprehension Ability

Correlations		
		Reading Comprehension Ability
Field Dependence	Pearson Correlation	.66**
	Sig. (2-tailed)	.000
	N	90

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

As table 5 shows, the obtained value of the Pearson Correlation Coefficient for the linkage between FI and global reading comprehension ability is r = - 0.70 at α = 0. 05 which is considered meaningful as well. Therefore, with 95 percent confidence it can be stated that there is a strong and meaningful correlation between FI and global reading comprehension ability. In other words, the students with a high degree of FI could better respond to global reading comprehension items.

Table 5: Pearson Correlation Coefficient for the Relationship between FI and Global Reading Comprehension Ability

Correlations		
		Global Reading Comprehension
Field Independence	Pearson Correlation	-.70**
	Sig. (2-tailed)	.000
	N	60

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

5. Discussion and Conclusion

Although so many studies have been conducted to investigate the relationship

between cognitive styles and L2 learning, in general, and FD/I cognitive styles and reading comprehension performance, in particular in the literature of SLA, there has been a paucity of research on the linkage between FD/I cognitive styles and global and local reading comprehension ability. The current study, therefore, set out to explore the relationship between FD/I cognitive styles and the capability of L2 learners to answer global and local reading comprehension questions.

In this regard, the first research question examined whether there is any meaningful correlation between FD degree with L2 learners' performance on local reading comprehension questions. The analysis of the obtained data revealed that the answer to this question was positive. In other words, the EFL learners with a high degree of field dependency got better score on local reading comprehension items and they could much efficiently overcome the items questioning detailed information. The possible interpretation is that the FD learners can dig into the details embedded in the readings and can locate the wanted information more easily.

Concerning the second research question, it investigated if there is any linkage between FI with EFL learners' performance on global reading comprehension questions. The findings indicated that there is a positive and meaningful correlation between the field independency and ability to answer the global reading questions. That is; it was found that, in general, the higher degree of FD, the more ability to answer the items targeting global information. This result is interpreted based on the literature on FD/I where it has been confirmed that the individuals with a high FI can better go beyond of the setting and have a much bigger pictures of the event. A point in this case, the analysis of the learners' responses showed that the FI students could better answer items questioning the general purpose of the passages.

The findings of the current study are not in overall correspondence with the research conducted by Salmanian (2002). He explored the relationship between FD/I cognitive style and performance on global and local comprehension questions, in particular and listening comprehension, in general. The results indicated that while there was not relationship between FD/I and the learners' performance on global items, there was a meaningful correlation between

FD/I and the ability to answer the local listening comprehension questions. However, the findings of the present study revealed that there is a clear relationship between FD/I and global/local reading comprehension ability.

The results attained in this researched confirmed the findings of the study carried out by Amiriy and Mall-Amiri (2015). They were going to investigate the FD/I, Reflectivity/Impulsivity and reading comprehension ability of the Iranian EFL learners. The analysis of collected data showed that there was a statistically significant correlation between FI and reading comprehension ability, as well as, between Reflectivity and reading comprehension skill. However, this study could not clarify the linkage between FI/D cognitive style and performance on global/local reading questions.

Reflecting the important role of the cognitive styles in SLA, the results of current study may imply that the fundamental necessity of taking EFL learners' FI/FD cognitive into account as a source of variation in language learning processes and test performance, particularly in reading comprehension skill. According to the results, it may seem reasonable to argue that L2 material developers, test designers, and practitioners pay attention to L2 learners' degree of FD/I as a crucial factor relevant to their L2 reading performance. In fact, taking account of the linkage between FD/I cognitive styles and L2 reading performance, L2 teachers can recognize their learners' strengths and weaknesses in L2 reading, match their teaching and testing materials to their cognitive styles. In this case, they can devise or choose more appropriate teaching or testing materials to address L2 learners' weaknesses and boost their strengths in L2 reading comprehension ability.

Furthermore, EFL teachers should raise EFL learners' awareness toward their dominant cognitive styles and the areas they should practice more. According to Ngeow (1999) and Xu (2011), understanding what types of cognitive styles they have, EFL learners will get a clearer picture of their learning process, find out why they feel comfortable in learning one aspect and have problems learning another aspect, and they can try to improve their learning and use their learning opportunities more efficiently. It is recommended that EFL teachers provide L2 learners with appropriate purposeful activities addressing their

weaknesses in L2 reading and offering proper individualized guidance to them. The findings also revealed the fact that not only L2 knowledge but also the degree of FD/I cognitive styles can be significantly related to L2 reading test performance. In fact, it is of considerable importance that L2 practitioners should pay careful attention to L2 learners' degree of FD/I as a significant and relevant factor, they should not make a judgment solely on the basis of L2 learners' scores on a reading test, and take more care in interpreting L2 reading scores.

Concerning the limitations of the present study, some points are worthy to be taken into consideration. The study results just showed a correlational linkage and not a cause and effect one. In addition, the findings may not be generalized to all the Iranian EFL learners with different proficiency levels and ages. Further, it is necessary to study the linkage between FD/I cognitive styles and global/local listening, speaking, and writing performance in EFL settings. Finally, it does worth exploring the effects of FI/D cognitive styles in a qualitative study to get more insights.

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