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ORIGINAL PAPER

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# The Relationship between Field Dependent-Independent Cognitive Style and Understanding of English Text Reading and Academic Success

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## ABSTRACT

**Background:** The learning styles are the distinctive learners' strategies for information processing and discovering new concepts. One of the most important kinds of learning styles is the *Witkin's* theory of field dependence-independence cognitive style. **Objective:** This study seeks to find the relationship between field dependence –independence cognitive style and English text reading comprehension, learning English as a foreign language, academic achievement and the choice of academic courses. **Methods:** In this study, 305 students (both girls and boys) studying at the junior level at high school in Sari were randomly selected through multistage selection who responded to Group Embedded Figures Test (GEFT). **Results:** The data analysis was conducted by using regression analysis which showed that FDI cognitive styles determined the changes in dependant variables of reading comprehension score, learning English and the total average with the respective values of %8.8, %9.2 and %11.6 ( $p < 0.05$ ). **Conclusion:** Regarding the findings, it can be concluded that the more field independent, the higher the reading comprehension skills and learning English and the more academic achievement will result. The results of this study can help in selecting students' courses and also better directing the learners to improve their learning.

**Key words:** field dependent-independent cognitive style, English reading comprehension skill, learning English, academic achievement

## 1. INTRODUCTION

One of the issues which received much emphasis and consideration in recent decades is the learners' styles and learning strategies. Considering all the researches, it is evident that the *Witkin's* theory of field dependent-independent cognitive styles due to their increasing applications were extensively used in many researches. Learning styles are the beliefs, preferences and behaviors that people employ in order to learn in a certain situation (1). In cognitive style, the field dependent learners are those learners who are most affected by their environment. They are inclined to overall field learning and tend to get the whole idea whereas the field independent learners conduct an analytical procedure and are more likely to break a model into different sections and details and tend to depend on their inner knowledge and analyze problems all by themselves without reference to the frame or the environment (2-4).

Considering field dependent-independent cognitive styles effects on teaching and learning, and especially on the students'

course selection, studies show that field independent student had better academic achievement than field-dependent students (5). The research by Al-Saai & Dwyer (1993) also showed that if the educational subjects and materials conform to students' cognitive styles, it will lead to a better achievement (6). Also, the studies revealed that if the field dependents and field independents are placed in homogeneous groups compared with being in the heterogeneous groups, they would show a better improvement the research by Al-Saai & Dwyer (1993) also showed that if the educational subjects and materials conform to students' cognitive styles, it will lead to a better achievement (7).

Field independence has also affected the English language learning. Studies have shown that field independent learners performed better than field dependent in learning English language (8). Pointing to the gender differences on learning styles, Hickson & Baltimore (1996) have shown that men and women have different learning styles (9).

The researches on the relationship between cognitive styles

and courses selection also revealed that there is a positive relationship between field independent cognitive styles and science courses selection and also field dependent and social sciences and human resources major selection (10). Therefore, regarding the researches conducted on this issue, this study seeks to examine the following research questions:

- a) Is there any relationship between field dependent – independent cognitive style and reading comprehension skill and English learning?
- b) Is there any relationship between the cognitive field dependent – independent styles and academic achievement?
- c) Is there a difference between the average scores of *Witkin's* theory of cognitive style in different high school majors?

## 2. MATERIAL AND METHODS

The study is an ex post facto or causal-comparative research. The study samples consisted of all students studying at junior level of high school in Sari, in the academic year of 2010-2011. The numbers of students comprised to 1476 from those 305 were selected for the study. To determine the sample size, the Kerjcie and Morgan table was used. Multistage cluster sampling was conducted to randomly select the sample. To measure the field dependency, the study enjoys the Group Embedded Figures Test (GEFT). This test was used by Witkin (2) in 1971 to measure the youngsters and adults' field dependence-independence cognitive style. The reliability of the test was calculated by Oltman and colleagues for men and for women as 0.82 & 0.79, respectively. The criterion-related validity for men was 0.82 and for women 0.63 (11).

In addition, in this study, each subject's score in English for the first semester in the academic year of 2010-2011 was regarded as a criterion for his progress in learning English. In order to evaluate the different skills in students' learning English at high school, we used the standard expert revised test which are used at national level and have objective scores. Each student's score in reading comprehension was used as a criterion for students' reading comprehension ability. Then, the average score of all the lessons at the end of the semester was set as a criterion for assessing the student's achievement.

## 3. RESULTS

### The first research question:

- a) Is there any relationship between field dependent – independent cognitive style and reading comprehension skill and English learning?

Correlation coefficient	Determination coefficient R2	F calculated	Critical F	df	P-Value
0.296	0.088	29.057	3.872	1.303	0.000
304	0.92	784/30			

Table 1. Linear correlation between FDI cognitive style and reading comprehension skill and English learning

Regarding the table above, the correlation is about 0.296 and the determination coefficient is 0.088 which shows that 8.8% of the changes in the reading comprehension can be evaluated by the FDI (field dependence/independence) cognitive style. The regression analysis results showed that the correlation is significant at 0.05 and the null hypothesis is rejected and the research hypothesis is confirmed (P<05). Therefore, it can be

concluded that there is a significant linear relationship between FDI cognitive styles and reading comprehension. It can also be seen from the above table that the values associated with this style and learning English is equal to 0.304 and the determination coefficient equals to 0.092, which shows that 9.2% of the changes in learning English can be explained by FDI cognitive style. The regression analysis results showed that the correlation is significant at 0/05 and the null hypothesis is rejected and the research hypothesis is confirmed (P<05). Therefore, it can be concluded that there is a significant linear relationship between FDI cognitive styles and learning English.

### The second research question

- Is there any relationship between the cognitive field dependent–independent styles and academic achievement?

Correlation coefficient	Determination coefficient R2	F calculated	Critical F	df	P-Value
.341	0.116	758.39	3.872	1.303	0.000

Table 2. Linear relationship between FDI cognitive style and academic achievement

It can be witnessed that the correlation value equals to .341 and determination coefficient was equal to 0.116 which indicates that 11.6 of changes in academic achievement can be explained by FDI cognitive style. The regression analysis results showed that the correlation is significant at 0.05 and the null hypothesis is rejected and the research hypothesis is confirmed (P<05). Therefore, it can be concluded that there is a significant linear relationship between FDI cognitive styles and academic achievement.

### The third research question

- Is there a difference between the average scores of *Witkin's* cognitive style in different high school majors?

This hypothesis is tested by "ANOVA" variance analysis.

Major	Number	Average	F calculated	Critical F	df	P-Value
Math and physics	80	11.33				
Empirical sciences	101	9.25	24.749	3.025	2.302	0.000
Human sciences and art	124	7.23				

Table 3. The comparison of students' cognitive styles averages based on their academic majors

It can be seen from the given table that at the significant level of 0/05, the differences between the students' cognitive styles in various high school majors is significant because the achieved P-Value is less than 0.05, therefore, the null hypothesis is rejected and the research hypothesis is confirmed. So it can be stated that the students' cognitive styles in different majors at high school are different.

In order to determine the difference between the means, the Tukey Follow up Test was used. By comparing the scores in Table 4, it can be inferred that the cognitive style scores in math students was higher than that of the students in the empirical sciences, and the empirical sciences students score was higher than the scores of students at Human sciences and art students.

High school majors	Average differences	P-Value
Math and human sciences	4.10*	0.000
Math and empirical sciences	2.08*	0.002
Empirical sciences and human sciences	2.02*	0.001

Table 4. Comparison of the theoretical basis of cognitive styles multiple means using Tukey Follow-up Test

#### 4. DISCUSSION

The general objective of this study was to examine the relationship between field dependent/independent cognitive styles of the students at the third year of secondary school for their reading comprehension skills. The results showed that there is a significant correlation between FDI cognitive styles and reading comprehension skill, English language learning and academic achievement at ( $P < 0.5$ ) so that the FDI cognitive styles would explain 8/8%, 9/2% and 11/6% of students' reading comprehension skills, learning English and academic achievement, respectively, which is congruent with the studies conducted by such (12-14) quoted by Tinajero & Paramo (1997) (12). Regarding such results we can say that FDI cognitive styles have important roles in learning and academic achievement.

Field independent students will perform better in formal educational environment such as schools which can be related to the effect of their cognitive style. Tinajero & Paramo (1998) stated that the studies in this field show that the field independent students have been performing better in formal educational environment in learning official languages .

They argue that the advantage gives students a higher ability in learning official languages which helps him increase his knowledge of second language learning skills and various other skills.

The results also showed a significant correlation between the scores of the FDI cognitive styles and course selection ( $P < 0.05$ ) which is consistent with researches by Witkin & Goodenough (1977). Also, applying the Tukey's test for this study showed that cognitive styles scores in math and physics students was higher than those of empirical sciences and the cognitive style scores of empirical sciences students were higher than those of the human sciences and art students. These results are consistent with previous research findings.

Witkin & Goodenough (1977) reported that in academic environments, field independent students are inclined to study in mathematics, science, architecture and engineering related fields and field dependent students prefer studying in elementary education, social sciences and psychology.

According to research conducted previously and also the findings of this research we can conclude that FDI cognitive styles can play an important role in second language text comprehension skills, academic achievement and second language learning and also the *Witkin's* theory of cognitive styles can play a major role in students' major selection.

In this study, data analysis showed that field independent cognitive styles of students in formal settings give them the ability to enjoy the academic achievement and also second language text comprehension skills and thus providing educational assistance to field independent students with informal environments will have impact in their different language skills and as a result their academic achievement. Besides, the result of the study showed that students with field independent cognitive styles are more

inclined to math and physics and empirical sciences majors and the field dependent students were more willing toward the human sciences and art majors with which students can be directed toward the majors which suits their cognitive styles.

#### 5. CONCLUSION

Individual differences and cognitive styles should be considered in foreign language teaching and learning acquisition theories. Cognitive styles help the learning process understanding. Although the cognitive process of acquiring a second language is not easily discovered and defined, understanding the cognitive styles helps clarify our understanding of language learning.

CONFLICT OF INTEREST: NONE DECLARED.

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