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The Effect of Field Dependence\Independence Cognitive Style on Deductive/Inductive Grammar Teaching

Ahmad Ebrahimi[1], Shabnam Zeynali[1], Khaled Dodman[2]

[1]Master of Educational Administration, University of Urmia, Iran, [2]Young Researchers and Elite Club, Malekan Branch, Islamic Azad University, Malekan, Iran

Email: ahmadebrahimia@yahoo.com

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Abstract

Recently, the interest of both teachers and researchers in the field of foreign language learning and teaching has increasingly focused on the learner, including the strategies which an individual uses in learning and communicating. The problem under investigation was to see whether there is any significant difference between the performances of field-independent learners in deductively/inductively taught grammar classes. The whole research was carried out in two major phases. In the first phase, The 54 field-independent subjects were randomly divided into two groups of 27 subjects. The researcher taught the first group deductively and the second group inductively. Finally, a post-test was administered. In the second phase, the same procedure was exactly carried out for field dependent learners. The results of the analyses for the collected data showed that there was a significant difference at the level of $p<0.05$ between the post-test scores of field dependent and independent subjects in the first group and their counterparts in the second group. In other words, the results of the study indicated that there was a cognitive style bias operating in conjunction with learning different grammatical structures regarding field-dependent/independent learners. Field-independent learners prefer deductive methods of teaching grammar whereas field-dependent ones prefer inductive methods of teaching grammar.

Keywords: Field Dependence\Independence, Cognitive Style and Deductive/Inductive Teaching.

Introduction

Over the last decade the number of studies concerning the effects of learner traits such as field- dependence/independence cognitive style has increased considerably. This is in part due to the fact that non-linguistic factors can strongly influence language learning. The purpose of this study is to explore the effects of field-dependence/independence cognitive style as independent variables on inductive/deductive teaching of grammar as dependent variables. That is, whether teaching grammar operates identically on different subjects who show pronounced differences in the above dichotomy.

Statement of the Problem

Recently, researchers have shifted their attention to the effects of learner traits such as field-dependence/independence cognitive style on learning different aspects and components of the language. The problem under discussion is that field dependence/independence as a cognitive style might strongly influence and determine the approach we take towards teaching grammar as one of the components of the language.

Significance of the Study

Special care should be taken when trying to choose an approach towards teaching grammar to field- dependent/independent students because a field independent person is one who tends to be more analytic and object-oriented .Hence, she/he is able to abstract an element from its context or background field. On the contrary, a field dependent person is one who is unable to abstract an element from its context or background field. So, whether to teach students with different cognitive styles inductively or deductively might be a matter of concern. The findings of this study would have both theoretical and practical implications to the field of language teaching. This study has particular relevance to the field of language teaching.

Literature Review

Cognitive Style

Cognitive style or learning style refers to general disposition toward processing information. Learning style is the biologically and developmentally imposed set of characteristics that make the same teaching method wonderful for some and terrible for others (Oxford, 2001). Richards, Platt & Platt (1992, p. 61) mentioned that “language learning styles are the particular way in which a learner tries to learn something. Different earners may prefer different solutions to learning problems”. Peacock & Ho (2003) explained about the language learning styles in the following way: Learning styles are cognitive and affective traits that are relatively stable indicators of how learner perceive, interact with, respond to the learning environment.

Field-dependence Cognitive Style

Field-dependent students find it more difficult to see the parts in a complex whole. They rely on others' ideas when solving problems and are good at interpersonal relationships (Johnson, Prior & Artuso, 2000). Field dependence is a learning style in which a learner tends to look at the whole of learning task which contains many items. The learner has difficulty in studying a field of other items (Richards, et al., 1992). a particular item when it occurs within Brown (2000, p. 115) mentioned that “Field dependence is synonymous with field sensitivity. It is the tendency to be dependent on the total field so that the parts embedded within the field are not easily perceived, although that total field is perceived more clearly as a unified whole.

Field-independence Cognitive Style

Field-independent students can easily separate important details from a complex or confusing background. They tend to rely on themselves and their own thought-system when solving problems. They are not so skilled in interpersonal relationships. (Marshal, 2002). Analytical style is another term for field-independent learning style, and it happens when a learner remembers something by separating it into parts. This is called an analytical style, or part learning. For example, a learner may divide a sentence into words, memorize the words,

and then combine them again to make sentences (Purpora, 1997).

Deductive Learning

Deductive learning, according to Campbell (1970), is an approach to language teaching in which learners are taught rules and given specific information about a language. According to Hadley (2003), a deductive approach to grammar teaching provides grammar rules before anything else. Many students and teachers are more comfortable with a rules-based approach to grammar and, though some teachers would argue against this approach, it is likely to continue to be used extensively in the classroom.

Inductive Learning

According to Chastain (1988), Inductive thinking proceeds from a specific case, or from cases, to the general. This is the opposite of deductive thinking. In inductive thinking the individual makes a number of observations which are then sorted into a concept or generalization; the individual does not have prior knowledge of the abstraction but only arrives at it after observing and analyzing the observations. According to Brown (2000), "inductive learning is the process by which the learner arrives at rules and principles by studying examples and instances". (p.97) Some researches including Cook (1991) feel that this approach is stronger as it helps to engage students more in the learning process and make them active learners.

Research Questions and Hypotheses

This research is motivated by the following questions:

1.Do field-independent learners show any significant preference towards deductive teaching of grammar?
2.Do field-independent learners show any significant preference towards inductive teaching of grammar?
3.Do field-dependent learners show any significant preference towards inductive teaching of grammar?
4.Do field-dependent learners show any significant preference towards deductive teaching of grammar?

In keeping with the above research questions, the following null hypotheses were proposed:

H0(1): Field-independent learners do not show any significant preference towards deductive teaching of grammar.
H0(2): Field-independent learners do not show any significant preference towards inductive teaching of grammer.
H0(3): Field-dependent learners do not show any significant preference towards inductive teaching of grammar.
H0(4): Field-dependent learners do not show any significant preference towards deductive teaching of grammar.

Method

To investigate the hypotheses, the researcher selected an experimental random sample for the collection of the data. The selected sample for this research included 160 students from Koshesh Language School (affiliated with the private sector). It is worth mentioning that all 160 subjects were intermediate female language learners. At first, the Group Embedded Figures Test was administered in order to determine the level of field dependence and

independence and therefore separate field independent learners from field dependent ones. Administering the test, the researcher found that out of 160 subjects, 82 were field independent and 78 were field dependent. The next step was the selection of almost homogeneous subjects. The Nelson Proficiency Test was given to both field independent and field dependent learners. Out of the 82 field independent subjects, 54 subjects whose scores were between one standard deviation above and below the mean were chosen. Also, Out of the 78 field dependent subjects, 52 subjects whose scores were between one standard deviation above and below the mean were chosen as being homogenous.

Instrumentation

Four different testing instruments were utilized in the process of this research study.

1. The Nelson English Proficiency test for the purpose of selecting close homogeneous students.
2. The Group Embedded Figures Test was the second instrument adopted in the research study. The above test was utilized to determine subjects' degrees of field dependence/independence cognitive style. As mentioned earlier, the test requires subjects to outline a simple geometric shape within a complex figure.
3. A grammatical pre-test which was used and validated by private Language School .
4. A grammatical post-test which was used and validated by private Language School.

Procedure

The whole project was carried out in two major phases. The 54 field independent and homogenous subjects took part in the first phase and the 52 field dependent and homogenous subjects took part in the second phase.

The procedure for the administration of the GEFT strictly followed the directions included in the manual. However, first, students were asked to fill in the identifying information on the cover page. It's notable that the information thus provided was absolutely necessary for the research study. Second, they were requested to start reading the directions which included two items designed to illustrate the procedure. Third, having read the directions, the students began the first section which contained 7 items with a time of 2 minutes. After the allotted time, the students stopped outlining the complex figures as they had been instructed, whether they had finished or not. The same procedure was also taken for the second and third sections. As mentioned earlier, the last two sections contained 18 figures in all and each had a time limit of 5 minutes.

Subject's scores on the GEFT range from 0 to 18 with the number correct being the score. The national norm on the GEFT is 11 correct. The higher the score above the group mean the more the person is considered to be field-independent. Conversely, the lower the score below the group mean the more the person is field-dependent. It must be stressed that learning styles are independent of intelligence.

Analysis

For the analyses of data, based on the design of the study, the statistical packages for social sciences was employed to perform te-test. That is, this statistical technique was used to figure the effects of test takers' field dependence/independence cognitive style.

FI Students (Deductive)

t-Test: Two-Sample Assuming Equal Variances

	Varible 1	Varible 2
Mean	29,1	21,93333
Variance	34,64482759	63,85747
Observation	27	27
Pooled Variance	49,25114943	
Hypothesized Mean Difference	0	
df	52	
T Stat	3,955074326	
P(T<=t) one-tail	0,000105371	
t Critical one-tail	1,671552763	
P(T<=t) two-tail	0,000210743	
t Critical two -tail	2,001717468	

As the results of the analysis illustrates, the first null hypothesis was rejected on the grounds that the critical value of t was 2.0017 but the obtained value was 3.95. In other words, since the obtained t value (=3.95) far exceeds 2.0017, it can be concluded that there is a statistically significant difference at the level of $p<0.05$ between the performance of field independent subjects in the first and second group. In other words, the field independent subjects in the first group outperformed the field independent subjects in the second group and therefore, the first null hypothesis was rejected.

FI Students (Inductive)

t-Test: Two-Sample Assuming Equal Variances

	Varible 1	Varible 2
Mean	26,67	48,6
Variance	97,87179	1410256
Observation	27	27
Pooled Variance	49,25114943	
Hypothesized Mean Difference	0	
df	52	
T Stat	1,675905	
P(T<=t) one-tail	7,22E-09	
t Critical one-tail	-7,39603	
P(T<=t) two-tail	1,44E-09	
t Critical two - tail	2,008559	

As the results of the analysis illustrates, the second null hypothesis could not be rejected on the grounds that the critical value of t was 2.008 but the obtained value was 1.67. In other words, since the obtained t value (=1.67) does not exceed 2.008, it can be concluded that at the level of $p<0.05$, FI students do not show any statistically significant preference towards the inductive method in teaching grammar. In other words, because the researcher tried to make the conditions as similar as possible for both groups, the lesser amount of progress the FI students in the second group made was because of the teaching method.

FD Students (Inductive)

t-Test: Two-Sample Assuming Equal Variances

	Varible 1	Varible 2
Mean	29,36666667	19,73333333
Variance	31,41264368	38,27126437
Observation	26	26
Pooled Variance	34.84195402	
Hypothesized Mean Difference	0	
df	50	
T Stat	6.320784239	
P(T<=t) one-tail	2.00489E-08	
t Critical one-tail	1.671552763	
P(T<=t) two-tail	4.00978E-08	
t Critical two - tail	2.001717468	

As the results of the analysis illustrates, the third null hypothesis was rejected on the grounds that the critical value of t was 2.0017 but the obtained value was 6.32. In other words, since the obtained t value (=6.32) far exceeds 2.0017, it can be concluded that there is a statistically significant difference at the level of $p<0.05$ between the performance of field dependent subjects in the first and second group. In other words, the field dependent subjects in the second group outperformed the field dependent subjects in the first group.

FD Students (Deductive)

t-Test: Two-Sample Assuming Equal Variances

	Varible 1	Varible 2
Mean	28	47.55556
Variance	31.41264368	38.27126437
Observation	26	26
Pooled Variance	34.84195402	
Hypothesized Mean Difference	0	
df	50	
T Stat	1.72896	
P(T<=t) one-tail	1.26E-12	
t Critical one-tail	-9.14126	
P(T<=t) two-tail	2.51237E-12	
t Critical two - tail	2.007583728	

As the results of the analysis illustrates, the fourth null hypothesis could not be rejected on the grounds that the critical value of t was 2.007 but the obtained value was 1.72. In other words, since the obtained t value (=1.72) does not exceed 2.007, it can be concluded that at the level of $p<0.05$, FD students do not show any statistically significant preference towards the deductive method in teaching grammar. In other words, because the researcher tried to make the conditions as similar as possible for both groups, the lesser amount of progress the FD students in the first group made was because of the teaching method.

Summary of Findings

The results of the analyses for the collected data showed that there was a significant difference at the level of $p<0.05$ between the post-test scores of field dependent and independent subjects in the first group and their counterparts in the second group. In other words, the results of the study indicated that there was a cognitive style bias operating in conjunction with learning different grammatical structures regarding field-dependent/independent learners.

Field-independent learners prefer deductive methods of teaching grammar whereas field-dependent ones prefer inductive methods of teaching grammar.

Pedagogical Implications

Since the old days, language learners have been supposed to be equal in the way they learn the grammar. That is, individual factors have always been neglected in this regard. Hence, the findings of the present study not only call the above method of testing into question but also call for a judicious coordination between the above variables. This can be best achieved by dividing learners according to their cognitive styles. Furthermore, the present research results can be beneficial to syllabus designers, curriculum and test developers on the ground that by dint of such studies, they will be able to make slight modifications on their approaches

to both language teaching and testing. That is, they can adapt their teaching and testing styles to students' cognitive styles.

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