

The Interactive Relationship between Inductive-deductive Grammar Teaching, Gender and the Cognitive Style of Iranian EFL Learners

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Abstract—There has usually been hot friction on the issue of whether inductive or deductive teaching mode would be more beneficial to EFL/ESL learners; thus, this research study tried to discover the effect of inductive-deductive grammar teaching on grammar learning of Iranian male-female EFL learners with FD-FI cognitive styles. The participants were 82 freshmen EFL learners. They were between 19 to 22 years old and selected quasi-randomly from Shahid Chamran University of Ahvaz, Iran. TOEFL and GEFT tests were administered respectively to homogenize and screen them. At last, after treatment, they took a posttest. The analysis of data via independent t-test and paired samples t-test revealed no significant difference between males and females participants in grammar learning through inductive and deductive mode. Besides, results showed that deductive mode was effective in the grammar learning of all male and female participants whether the cognitive style was FD or FI. Furthermore, it was indicated that inductive approach was effective on female with FI cognitive styles, but ineffective on males with the same cognitive style.

Index Terms—inductive, deductive, gender, field dependent, field independent, cognitive styles, grammar

I. INTRODUCTION

Indubitably, grammar is one of the basic elements that both receptive and productive language skills are hinged on. Grammar, syntactically and semantically, designates the function of linguistic elements in the written or spoken utterances that leads to bilateral communication. This linguistic component underwent a period of disfavor during the sixties and the seventies of the last century. Nonetheless, once again, a recursive trend towards grammar teaching is begun that proves its primacy.

Nassaji and Fotos (2004) stated that anti-grammarians idea could be represented by Krashen's (1981) distinction between learning and acquisition of language. It was believed that language should be acquired through natural exposure. Takahashi (2005) argues that if EFL learner is not propped up with strong grammatical knowledge he cannot perform sophisticated tasks. Leaver, Ehrman and Shekhtman (2005) argue that the knowledge of form and syntax (word order) shed itself vital to achieve success in SLA since only having knowledge of vocabulary is not enough to communicate vital feelings and information exactly. Candlin and Mercer (2001) argue that the SLL need to be subject to form-focused exercises qualifying them to express not only intricate meanings but also states of affairs. Lynn Savage, Bitterlin and Price (2010) describe the three roles that underlie the importance of grammar in adult education as; 1) grammar as an enabling skill 2) grammar as a motivator 3) grammar as a means to self-correction.

Among various modes, we picked inductive- deductive modes up, as, there have often been innumerable debates and experiments on their effectiveness in teaching instructional materials to EFL/ESL learners. But this time, looking piercingly from a new panorama, this study attempted to inquire this effectiveness while considering gender (male & female) and the inner world (field dependence & field independence) of the learner at the same time. As a revolution in psychology, individual differences constructing the body of personality is composed of two dimensions; emotional styles and cognitive styles. Each entails several emotional and cognitive differences in different individuals resourcing from so many biological, cultural, gender-specific and educational background data. Among cognitive styles this study focuses on opposite, bipolar FD and FI cognitive styles.

II. LITERATURE REVIEW

A. Grammar Concept

Having a retrospective glance through the long history of grammar smoothen the way to locate the place of this study in the realm of grammar instruction. The "grammar" term for the first time appeared in Greek and there have always been controversial arguments between two grammarians and anti-grammarians opposite poles. In one hand, standing on anti-grammarians position, Krashen (1982, pp. 83-4) postulates that "A very important point that needs to be stated is

that learning does not "turn into" acquisition. We often see acquisition in cases where learning never occurred. There are many performers who can use complex structures in a second language who do not know the rule consciously and never did".

On the other hand, standing on grammarian position, Takahashi (2005) argues that EFL language learner should be equipped with sound knowledge of the grammatical base of a foreign language; in that case, they can perform any kind of sophisticated linguistic task. Otherwise, they are in the possession of nothing more than the competence to make an order in restaurant or to construct simple phrases in everyday greeting.

B. Inductive and Deductive Teaching

Takimoto (2008) asserted that inductive teaching will be effective as forms are included in functions and it will lead to the longer recalling of rules. Nessel and Dixon (2008) argue that pedagogue's question during implicit analysis of forms not only intrigues the students to ponder and disclose the patterns but also makes them to generalize the target rules.

In explicit teaching, one of the basic techniques in Direct Method, Audio- Lingual Method and Silent Method, according to Freeman and Anderson (2011), materials are presented to memorize, in such a way that firstly, a detailed explanation of them introduced then exemplified, but it is vice versa in implicit teaching mode. Freeman (2009, p. 528) maintains that "explicit instruction is where students are instructed in the rules or patterns (deductive)".

C. Cognitive Style

The term cognitive style was used by Allport (1937), and has been described as a person's typical or habitual mode of problem solving, thinking, perceiving and remembering. Ellis (1985) defines that "cognitive style is a term used to refer to the manner in which people perceive, conceptualize, organize and recall information" (p. 114). Cheng and Zheng (2002, p. 423) define it as: "the learner's way of distinguishing, processing, storing, extracting information in the cognitive process, and the learner's orientation of solving problems as well".

D. Field Dependent- Field Independent Cognitive Styles

According to Ehrman and Leaver (2003) FI is the amount of concentration that person puts on some aspect of experience and isolates it from its background. They add that FI learner can discern and pick out exactly the target tree among a mass of trees in forest, on the other hand, FD learners haven't such a discriminative competence and perceive the whole of background.

Khoury (2013) states that FI is a personality trait that inclines the individual to de-contextualize an item from its field (back ground) then re-contextualizing it, on the other hand, FD is individual tendency to stick to context in such a way that makes them incompetent to decipher items from their backfield.

E. Studies Conducted on Inductive- Deductive Teaching

After conducting a study, Rizzuto (1970) concluded that the inductive method is superior in the teaching of morphological and syntactic concepts regardless of Ss' verbal ability level, and an investigation of the treatment by sex interaction suggests that inductive methods may be more effective with female Ss. In terms of conceptual understanding, the result of a study by Huffman (1997) indicated that there was no overall difference between the two inductive and deductive groups; however, there was a significant interaction between the sex of the students and group. The explicit strategy appeared to benefit female students, while the textbook strategy appeared to benefit male students. The results of a study by Shih (2008) is summarized as follows; 1. No significant difference was found between inductive and deductive groups on the performance the immediate test 2. High achievers benefited more from deductive approach than from inductive one 3. No significant gender- by- treatment (teaching approach) was found and gender did not affect the effectiveness of inductive or deductive approach 5. Male subjects did not significantly outperform the female one in inductive group. Male and female students had equivalent performance with inductive instruction. The comparative analysis of data gathered by Behjat (2008) indicated that both groups improved in grammar knowledge as well as statistics indicated that males learned grammar better when they were taught inductively and females showed a better performance when they were taught deductively. Lau and Yuen (2009) investigated the effects of gender and learning styles on computer programming performance. Two hundred and seventeen secondary school students of age from 14 to 19 participated in this study. The finding disclosed that there were no gender differences in programming performance after controlling for the effect of student ability.

The results of a study by Haight, Herron and Cole (2007) indicated a significant difference between participants' mean immediate test scores favoring the guided inductive approach. Findings of this study also indicated a strong trend in favor of guided induction on the long-term learning of grammatical structures. Studying on the effectiveness of guided inductive versus a deductive approach on short and long-term learning of 10 structures, Vogel, Herron, Cole and York (2011) affirmed a significantly greater effect of the guided inductive approach on short-term learning by calculating mean and standard deviations for the scores of both groups showed that students performed better in the guided inductive condition than in the deductive condition. The long-term findings and the relationship between preferences and performances were not significant.

The results of Ameri- Golestani and Nezakat- Alhossaini's (2012) study on the effectiveness of explicit teaching and conscious raising with 45 IELTS candidates showed that raising student's consciousness was a much more effective way than mere explicit teaching. The results of Wang's (2012) investigation into "Teaching English Verb Tenses" through two deductive-inductive grammar teaching approaches indicated that both FI and FD students improved significantly, and FD student improvement was especially evident. Moreover, FD students in both groups improved more than FI students, but the difference was not significant.

III. THE STATEMENT OF PROBLEM

The most common mode of teaching grammar utilized by teachers is inductive or deductive mode. This fact occurs while teachers do not consider other variables such as gender and the FD- FI cognitive styles of students (habitual way of thinking, analyzing, preferring) which is a prominent subject in the scope of EFL learning and may influence on the process of learning. To make this process more safe and facile, the grammar teachers are expected to teach in an appropriate mode meshed with appropriate gender and cognitive style of learner.

Therefore, at this point a problem raises and that is they do not know which teaching approach is more effective if it is matched with appropriate gender and cognitive style of participants. And since almost no study has been run to investigate this appropriateness, the researchers tried to investigate it.

Research Questions

The present study seeks to answer the following questions:

1. Is there any significant difference between male and female Iranian EFL learners in the grammar learning through two modes of teaching: inductive and deductive?
2. If gender can affect the way of learning grammar, which one (male or female) is in advantage when learning through two modes of inductive and deductive teaching?
3. Considering gender and the FD- FI cognitive styles of learners at the same time, which teaching mode; inductive or deductive is in advantage?

IV. METHODOLOGY

A. Participants

A sample of 86 freshmen, between 19 to 22 years old, male and female EFL language learners majoring in English translation and literature studying in their first academic B.A. course of study were selected in a stratified simple randomization from Shahid Chamran University of Ahvaz, Iran. They were randomly assigned to four predetermined sub-groups of male and female participants with inductive - deductive modes of teaching grammar. We have attempted to assign equal number of male and female participants. They were all from the same cultural and linguistic background. After conducting TOEFL test 62 were left as the participants of study, the following table indicates these information.

TABLE 4.1:
THE PARTICIPANTS OF MAIN STUDY

TOTAL	Number of Each Group	Group	Gender		Cognitive style	
62	31	Deductive Group	15	Male	6	FI
				Female	9	FD
			16	Male	7	FI
				Female	9	FD
	31	Inductive Group	13	Male	8	FI
				Female	5	FD
			18	Male	6	FI
				Female	12	FD

B. Instruments

Under the supervision of two experts in the field of TEFL, all the following instruments were provided and utilized to run the data collection procedures. The first instrument was a proficiency TOEFL test selected from TOEFL Actual Tests by Moallem Ebtada (2004) to determine their proficiency in English and homogenize them. The second instrument was a group embedded figure test (GEFT) by Witkin, Oltman, Raskin and Karp (1971) to pinpoint the FD-FI cognitive style of the subjects.

The third instrument was a self-made Pre-test taken by participants before the treatment, to determine the proficiency level of participants' knowledge on the target grammar (adverb clauses). The materials on target grammar which were applied in the pre-test were chosen based on Comprehensive Grammar Vocabulary and Idioms for TOEFL by Teimoori (2007), Communicate What You Mean by Pollock (1997), TOEFL Grammar Flash by Broukal (2005), Oxford Practice Grammar by Eastwood (2011), and Modern English by Frank (1972). The Pre- test totally was composed of 20 items and 1 score was designated to each item; therefore the total score was equal to 20.

The fourth instrument, a post-test designed in parallel (identical) form with the same grammar content and equal number of items, but not designed with exactly the same items included in pre-test. The researchers conducted a pilot

study to obtain the reliability of these tests by administering the pretest to 62 students with the same background knowledge and field of study but other than those participating in the main study. After calculating the tests reliability via statistic KR 20 formula, the estimate reliability index was about 0.85 that certified the reliability of the pretest to conduct in the main study.

C. Materials

A self-designed pamphlet on “English Adverb Clauses and the grammar on Reducing Adverb Clauses” was used as the course instructional material. The pamphlet was prepared under the supervision of two experts having Ph.D. in TEFL. The researchers selected this grammatical point because of two reasons; one is that Iranian EFL learners are often in trouble while reducing such complex structures and another is that the participants of study were following their first B. A. academic course in grammar and not yet presented with such a grammar topic.

A Video Project was also deployed to teach the instructional materials (pamphlet) to students through power point software program. The instructional materials included in the pamphlet were designed in power point software program in different orders of explanation and examples to the appropriate inductive and deductive teaching approach.

D. Data Collection Procedures

At the beginning of the experiment, in the first stage, the researchers administered a proficiency TOEFL test (2004) selected from TOEFL Actual Tests by Moallem Ebtada. It was administered at the beginning of the experiment to homogenize the participants of study. Those participants receiving 1 standard deviation ($SD= 7.29$) above and below the mean of the scores were considered as the participants of study. Statistical analysis of the scores from TOEFL test revealed that those obtaining the score between the range of 33.75 and 48.32 must be considered as the participants of this study. As a result of this fact, the scores of 24 participants were not included in the statistical calculations of our study; consequently 62 participants were left as the participants of study.

During the next stage, a GEFT test was presented to the participants to determine their FD-FI cognitive styles. As the total score on this test was 18 and the mean score of the GEFT test was 11.37, those participants obtaining scores above it were considered as FI and those below as FD. Considering gender and the FD- FI cognitive style of the subject, the researchers divided them into two equal groups through stratified simple random selection and then he assigned inductive instruction to one group and deductive to another.

In the fourth step, the researchers administered the pretest as a pilot study to the first semester students of Lorestan University following their B.A. educational courses in English literature who had not still received any particular instruction on the given grammar and subsequently the statistical analysis of data gathered through Pearson- KR 21 revealed the reliability of about 0.85. In the fifth step, a pretest was administered, not only to determine participants' prior knowledge but also participants' proficiency level in the given grammatical point. Those participants with full knowledge on the given grammatical point.

In the step six, the participants took their first instructional session over 1 hour. Each session took 120 minutes; in the first half the inductive group was instructed and during the second half deductive group was instructed. Finally, at the end of experiment about 10 days after the final instructional session, a posttest was administered to discover their potential grammar knowledge on the given grammar which was taught over three successive weeks.

E. Inductive Grammar Instruction

The procedure for conducting inductive grammar instruction was as follows; (1) the researcher deployed power point slides on video project to present several examples containing the same target grammar (adverb clause) features. (2) When an example was presented the teacher then presented the reduced form and allowed the students to read it carefully, formulate and then generalize the underlying rule to more examples and (3) If the rule were not revealed to them the teacher would ask some conscious raising questions, slight hints, if not workable, finally a brief summary of underlying rule were given. (5) Finally, the teacher could ask some students, if volunteered, to come to the board and to write some examples on the board to assimilate rules into new textual context (rule generalization).

F. Deductive Grammar Instruction

Firstly, the researcher (teacher) explained in details the rules on the premise of which the adverb clauses were reduced, then he presented few relevant examples on the target grammar (English adverb clauses). After that the teacher required some students, if volunteered, to come to write more examples on the white board and write more examples or even he might ask them to translate some Persian examples to require them produce the target grammatical form. Finally, he asked some students to explicitly explain the underlying rule of the target grammar.

G. Data Analysis

Since the first and second research questions are interwoven, having employed independent samples T- test and paired samples test, the researchers went through the following cases of data analysis:

Case 1: Analyzing and comparing the mean of scores on pre-test, post- test and progress, between males and females taught in inductive mode

Case 2: Analyzing and comparing the mean of scores on pre-test, post- test and progress, between males and females taught in deductive mode

Case 3: Analyzing and comparing the mean of males' scores on pre-test and post- test taught in inductive mode

Case 4: Analyzing and comparing the mean of females' scores on pre-test and post- test taught in inductive mode

Case 5: Analyzing and comparing the mean of males' scores on pre-test and post-test taught in deductive mode

Case 6: Analyzing and comparing the mean of females' scores on pre-test and post-test taught in deductive mode

Case 7: Analyzing and comparing the mean of scores on pre-test, post-test and progress obtained by males taught in inductive mode with males taught in deductive mode

Case 8: Analyzing and comparing the mean of scores on pre-test, post-test and progress obtained by females taught in inductive mode with females taught in deductive mode

Also, to answer the second research question, "Considering gender and the FD- FI cognitive styles of learners at the same time, which teaching mode; inductive or deductive is in advantage?" the researchers employed paired sample test. It should be added that the significant level of both the independent samples T-test and paired sample test was 0.05. If the comparison culminated in a figure was more than the criterion significant level, it would be the index of no significant difference between/among sides of comparison.

V. RESULTS

A. Descriptive Analysis

The researchers applied Independent Samples T-test and Paired Samples T-test with the significant level of 0.05 to answer the research questions. If the figure obtained on Sig. and or on Sig. (2. tailed) fell above the significant level of 0.05, it was an index of meaningfulness in the relationship under the investigation. And, if the observed figure on Sig. was dropped below the significant level of 0.05, it was an index of negative meaningfulness in the relationship.

B. Results of the First and Second Research Questions

Case 1: The statistical data on the number and gender of participants in case 1 are collected in table 1.

TABLE 1:
GROUP STATISTICS

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Progress	male	13	3.50	2.42	.67
	female	18	3.94	2.81	.66
Pre-test	male	13	8.53	2.06	.57
	female	18	7.22	2.46	.58
Post-test	male	13	12.03	2.82	.78
	female	18	11.16	2.34	.55

C. Inferential Analysis of Case 1

Analyzing and comparing the scores obtained by males and females taught in inductive mode (case 1), on pre-test, post- test and progress, via independent samples T-test, revealed that there was no significant difference between these two categories. As it is indicated through table 2, the amount of significant difference on pre-test, post-test and progress, in order, was 0.42, 0.52 and 0.76. Since these figures were higher than the criterion significant level of 0.05, the equal of variances is assumed; therefore, there was no significant difference between males and females taught in inductive mode.

TABLE 2:
INDEPENDENT SAMPLES T-TEST

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2.tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Progress	Equal variances assumed	.09	.76	-.45	29	.65	-.44	.96	-2.42	1.53
	Equal variances not assumed			-.47	28.01	.64	-.44	.94	-2.38	1.49
Pre-test	Equal variances assumed	.66	.42	1.56	29	.12	1.31	.83	-.40	3.03
	Equal variances not assumed			1.61	28.25	.11	1.31	.81	-.35	2.98
Post-test	Equal variances assumed	.41	.52	.93	29	.35	.87	.92	-1.02	2.77
	Equal variances not assumed			.90	22.91	.37	.87	.95	-1.11	2.85

Case 2: The statistical data on the number and gender of participants in case 2 are collected in table 3.

TABLE 3:
GROUP STATISTICS

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Progress	male	15	4.00	3.05	.78
	female	16	4.18	2.90	.72
Pre-test	male	15	8.20	2.24	.57
	female	16	6.87	2.62	.65
Post-test	male	15	12.20	2.78	.71
	female	16	11.06	2.58	.64

D. Inferential Analysis of Case 2

After calculating the mean of scores via independent samples T-test, on pre-test, post- test and progress, between males and females taught in deductive mode (case 2), just like case 1, the researchers concluded that there was no significant difference between males and females taught deductively. As table 4 indicates, the amount of significant difference on pre-test, post-test and progress, in order, was 0.44, 0.89, and 0.91 that were more than the significant level of 0.05; hence, there was no significant difference between these two categories, too.

TABLE 4:
INDEPENDENT SAMPLES T-TEST

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2.tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Progress	Equal variances assumed	.01	.91	-.17	29	.86	-.18	1.07	-2.37	2.00
	Equal variances not assumed			-.17	28.59	.86	-.18	1.07	-2.38	2.00
Pre-test	Equal variances assumed	.61	.44	1.50	29	.14	1.32	.88	-.47	3.12
	Equal variances not assumed			1.51	28.75	.14	1.13	.87	-.46	3.11
Post-test	Equal variances assumed	.01	.89	1.18	29	.24	1.13	.96	-.83	3.10
	Equal variances not assumed			1.17	28.43	.24	1.13	.96	-.83	3.11

Case 3: The statistical data on the number and gender of participants in case 3 are collected in table 5.

TABLE 5:
PAIRED SAMPLES STATISTICS

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test	8.53	13	2.06	.57
	Post-test	12.03	13	2.82	.78

E. Inferential Analysis of Case 3

Analyzing and comparing males' scores on pre-test and post- test, taught inductively (case 3), via paired samples test also revealed that there was a significant difference between the mean of scores on pre-test and post-test. As it is indicated in the table 6, the amount of sig. (2.tailed) was 0.00. Since the obtained figure was less than the significant level of 0.05, the researchers came to the conclusion that the male's scores on post-test was higher than the same males' score on pre-test.

TABLE 6:
PAIRED SAMPLES TEST

	Paired Differences				t	df	Sig. (2.tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Pre-test- Post-test	-3.50	2.42	.67	-4.96	-2.03	-5.20	12	.00

Case 4: The statistical data on the number and gender of participants in case 4 are collected in table 7.

TABLE 7:
PAIRED SAMPLES STATISTICS

Pair 1		Mean	N	Std. Deviation	Std. Error Mean
	Pre-test	7.22	18	2.46	.58
	Post-test	11.16	18	2.34	.55

F. Inferential Analysis of Case 4

just like case 3, conducting an inquiry into the mean of females' scores on pre-test and post- test taught in inductive mode (case 4), it was revealed that there was a meaningful relationship between males' score on pre-test and post-test. Because, as it is indicated through table 8, the statistical figure on Sig. (2. tailed) was less than the significant level of .05.

TABLE 8:
PAIRED SAMPLES TEST

	Paired Differences					t	df	Sig. (2.tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre-test- Post-test	-3.94	2.81	.66	-5.34	-2.54	-5.94	17	.00

Case 5: The statistical data on the number and gender of participants in case 5 are collected in table 9.

TABLE 9:
PAIRED SAMPLES STATISTICS

Pair 1		Mean	N	Std. Deviation	Std. Error Mean
	Pre-test	8.20	15	2.24	.57
	Post-test	12.20	15	2.78	.71

G. Inferential Analysis of Case 5

Passing through the inquiry into case 4, the researchers made an attempt to investigate into males' scores on pre-test and post-test taught deductively (case 5). Analyzing the data collected via paired samples test divulged that there was a meaningful relationship between males' scores obtained on pre-test and post-test. In effect, the statistics of paired samples test (table10) indicated that the amount of Sig. (2. tailed) was 0.00. This figure dropped below the significant level of 0.05; conclusively, deductive mode showed itself effective in the grammar learning of Iranian EFL male learners.

TABLE 10:
PAIRED SAMPLES TEST

	Paired Differences					t	df	Sig. (2.tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre-test- Post-test	-4.00	3.05	.789	-5.69	-2.30	-5.06	14	.00

Case 6: The statistical data on the number and gender of participants in case 6 are collected in table 11.

TABLE 11:
PAIRED SAMPLES STATISTICS

Pair 1		Mean	N	Std. Deviation	Std. Error Mean
	Pre-test	6.87	16	2.62	.65
	Post-test	11.06	16	2.58	.64

H. Inferential Analysis of Case 6

Analyzing the data via paired samples test indicated that there was a meaningful relationship between the females' scores on pre-test and post-test (case 6). As table 12 indicates, the amount of Sig. (2tailed), that was 0.00, fell below the criterion significant level of 0.05, and it was the index of the fact that females gained scores on post-test that were higher than pre-test scores, and deductive mode was effective in the grammar learning of Iranian EFL female learners.

TABLE 12:
PAIRED SAMPLES TEST

	Paired Differences					t	df	Sig. (2.tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre-test- Post-test	-4.18	2.90	.72	-5.73	-2.64	-5.76	15	.00

Case 7: The statistical data on the number and gender of participants in case 7 are collected in table 13.

TABLE 13:
GROUP STATISTICS

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Progress	Male / Deductive	15	4.00	3.05	.78
	Male/ Inductive	13	3.50	2.42	.67
Pre-test	Male/ Deductive	15	8.20	2.42	.57
	Male/ Inductive	13	8.53	2.06	.57
Post-test	Male/ Deductive	15	12.20	2.78	.71
	Male/ Inductive	13	12.03	2.82	.78

I. Inferential Analysis of Case 7

The scores on pre-test and post-test obtained by males taught in inductive and the other males taught in deductive modes (case 7) revealed that there was not any significant difference between males taught inductively and males taught deductively over the three pre-test, post-test and progress. As it is indicated through table 14, the amount of Sig. on pre-test, post-test, and progress, respectively, was 0.91, 0.98, and 0.60. Since all these figures were more than the significant level of 0.05, no meaningful relationship between these two categories (Male/Inductive & Male/ Deductive) in pre-test, post-test and progress test was confirmed.

TABLE 14:
INDEPENDENT SAMPLES T-TEST

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2.tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Progress	Equal variances assumed	.28	.60	.47	26	.63	.50	1.05	-1.66	2.66
	Equal variances not assumed			.48	25.82	.63	.50	1.03	-1.63	2.63
Pre-test	Equal variances assumed	.01	.91	-.41	26	.68	-.33	.81	-2.02	1.34
	Equal variances not assumed			-.41	25.88	.68	-.33	.81	-2.01	1.33
Post-test	Equal variances assumed	.00	.98	.15	26	.88	.16	1.06	-2.02	2.34
	Equal variances not assumed			.15	25.32	.88	.16	1.06	-2.02	2.34

Case 8: The statistical data on the number and gender of participants in case 8 are collected in table 15.

TABLE 15:
GROUP STATISTICS

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Progress	Female / Deductive	16	4.18	2.90	.72
	Female/ Inductive	18	3.94	2.81	.66
Pre-test	Female/ Deductive	16	6.87	2.62	.65
	Female/ Inductive	18	7.22	2.46	.58
Post-test	Female/ Deductive	16	11.06	2.58	.64
	Female/ Inductive	18	11.16	2.34	.55

J. Inferential Analysis of Case 8

After conducting an independent samples T-test to compare the scores obtained by females taught inductively with the other females' scores taught deductively (case 8), it was revealed that there was not any significant difference between these two categories (Female/Inductive & Females/ Deductive) in pre-test, post-test, and progress (table 16), since the amount of Sig. for pre-test, post-test, and progress, in order, was 0.86, 0.57, and 0.88 that fall above the criterion significant level of 0.05.

TABLE 16:
INDEPENDENT SAMPLES T-TEST

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Progress	Equal variances assumed	.02	.88	.24	32	.80	.24	.98	-1.75	2.24
	Equal variances not assumed			.24	31.28	.80	.24	.98	-.176	2.24
Pre-test	Equal variances assumed	.031	.86	-.39	32	.69	-.34	.87	-2.12	1.43
	Equal variances not assumed			-.39	30.92	.69	-.34	.87	-2.13	1.44
Post-test	Equal variances assumed	.32	.57	-.12	32	.90	-.10	.84	-1.82	1.61
	Equal variances not assumed			-.12	30.56	.90	-.10	.84	-1.83	1.62

K. Descriptive Analysis of Third Research Question

To answer the third research question “Considering gender and the FD- FI cognitive styles of learners at the same time, which teaching mode; inductive or deductive is in advantage?” we employed paired sample T- test. The significant level for this test was also 0.05. If the amount of Sig. for a particular category fell below the significance level of 0.05, it would be an index of appropriateness of those three factors (gender, teaching mode, and cognitive style) together, and vice versa.

L. Inferential Analysis of Third Research Question

Another issue that almost had not been worked on appeared in question three, as it is displayed in table 17, the amount of significance level for female and FD participants taught inductively was 0.00. This figure was less than the significant level of 0.05; conclusively, this mode was influential when participants were female with FD cognitive styles, whereas this mode was not workable for male participants with the same cognitive style, since the amount of sig. for it was equal to 0.10.

TABLE 17:
PAIRED SAMPLE T- TEST

	FD- FI Class	Field-Dependent		Field-Dependent		Field-Independent		Field-Independent		
		Deductive		Inductive		Deductive		Inductive		
	Gender	Female	Male	Female	Male	Female	Male	Female	Male	
Paired Differences		Paired 1 pretest-posttest	Paired 1 pretest-posttest	Paired 1 pretest-posttest	Paired 1 pretest-posttest	Paired 1 pretest-posttest	Paired 1 pretest-posttest	Paired 1 pretest-posttest	Paired 1 pretest-posttest	
	Mean	-4.61	-3.50	-4.41	-2.70	-3.64	-4.75	-3.00	-4.00	
	Std. Deviation	3.39	3.69	2.70	2.86	2.24	1.78	3.04	2.15	
	Std. Error Mean	1.13	1.23	0.780	1.28	0.85	0.72	1.24	0.76	
	90% confidence interval of the differences	Lower	-7.23	-6.34	-6.13	-6.25	-5.72	-6.61	-6.20	-5.80
		Upper	-1.99	-6.656	-2.69	0.85	-1.56	-2.88	0.20	-2.19
t		-4.07	-2.83	-5.65	-2.10	-4.28	-6.53	-2.41	-5.25	
df		8	8	11	4	6	5	5	7	
Sig. (2-tailed)		0.00	0.02	0.00	0.10	0.00	0.00	0.06	0.00	

Also, it was revealed that inductive mode showed itself effective when the participants were males with FI cognitive style, because the amount of Sig. for this category was equal to 0.00, even though it was not effective in the grammar learning of females with the same cognitive style (FI), since the amount of sig. for this category was equal to 0.06. Furthermore, it was elicited that deductive mode was influential in all cases, whether the participants were FI or FD, since the amount Sig. for all cases was less than the criterion level of 0.05.

In addition, since the amount of sig. for female and FD participants taught inductively was 0.00 that was less than the significant level of 0.05, conclusively this mode of teaching was effective for grammar teaching when students were female with FD cognitive styles, whereas this teaching approach was not suitable for the male with the same cognitive style, since the amount of sig. for it was equal to 0.10 that was more than the significant level of 0.05.

Furthermore, it was indicated that while inductive mode was effective for male participants with FI cognitive style, since the amount of sig. for this category was equal to 0.00 that was less than the significant level, it was not effective

for the females with the same cognitive style, since the amount of sig. for this category was equal to 0.061 that was more than the significant level of 0.05.

VI. DISCUSSION

The results of this research study in case 1, as indicated in table 2, revealed that there was no significant difference between males and females taught inductively due to the fact that the obtained sig. figures for pre-test, post-test and progress, in order, 0.42, 0.52, and 0.76 went above the significance level. Also, as indicated via table 4, result was the same for deductive mode in case 2.

Additionally, according to tables 6 and 10 (case 3, 5), it was proved that both males taught inductively and deductively progressed in grammar learning, but as indicated in tables 14 (case 7), no significant difference between two cases was observed. Furthermore, according to tables 8 and 12 (case 4,6), it was proved that both females taught inductively and deductively improved in grammar learning, though, as indicated in tables 16 (case 8), no significant difference between two cases was observed. As it was also revealed in table 17 that deductive teaching mode was appropriate and workable in both genders whether the participants were field- dependent or field- independent, while, in two cases, inductive teaching approach did not show itself effective when the participants were male with field dependent cognitive style as well as when they were female with field- independent cognitive style.

Briefly speaking, the results of our study revealed 1. No gender difference in grammar learning through two teaching modes was observed. 2. Deductive approach was appropriate for both males and females whether the cognitive style was FI or FD. 3. Inductive teaching mode showed itself workable with all participants except for male FD participants and female FI participants. 4. Gender and teaching mode did not affect the way of learning; rather, it may be resulted from the cognitive style of the participants.

The observed results of this work may result from some presumable reasons; one and maybe the main was the shortage of population, since it was approximately impossible to find more participants at the same time in the same context (Ahvaz). In addition, this work took under investigation several variables and we divided the sample into four subgroups. Another liable reason was ensued from the issue that Iranian EFL learners are not acquainted with teaching grammar in inductive mode, as during all over the treatment period they often showed their dissatisfaction by such statements like "you should first explain the grammar to us and then go to work on examples "we won't learn; we had never been taught in such a method". Finally, these results possibly were resourced from the difficulty degree of instructional materials, due to the fact that our work concentrated on the shortening of Complex English Sentences that requires recognizing and learning rules, afterwards shortening them.

Contemplating the results of our research study from a gender perspective, we came to the conclusion that these findings were similar to Shih' (2008) study arguing that there is no gender difference between inductive and deductive groups by confirming that 1. No significant difference was found between inductive and deductive groups on the performance the immediate test 2. No significant gender- by- treatment (teaching approach) was found and gender did not affect the effectiveness of inductive or deductive approach 3. Male subjects did not significantly outperform the female one in inductive group. 4. Male and female students had equivalent performance with inductive instruction.

Also, these results were in consistent with the results of Huffman's (1997) study contending that there is no significant difference between explicit and implicit modes in the terms of conceptual understanding. Additionally, these results were in consistence with Lau and Yuen's (2009) study who investigated the effects of gender and learning styles on computer programming performance and then argued that there was no gender difference in result of computer programming performance. Haight, Herron and Cole (2007) argued that there was no significant difference between inductive and deductive grammar learning in long term memory.

Inconsistent with the above-mentioned studies, Rizzuto (1970) argued that inductive teaching mode was better than deductive with females when teaching morphological and syntactic concepts. Also, Haight, Herron and Cole (2007) argued that inductive was better than deductive in short term memory but in long term memory there was no significant difference was observed. Furthermore, Behjat' (2008) study in Shiraz Azad university contended that there was a gender difference, in such a way that males were better with inductive mode while females with deductive.

VII. CONCLUSION

In general, the inferential analysis of collected data with regard to first and second research question revealed that both male and female improved in the way of grammar learning not only when taught inductively mode but also when taught deductively, but there was no significant difference between these two categories (tables 2, 4) . Additionally, it was proved that both males taught inductively and deductively progressed in grammar learning but no significant difference between these two cases was observed (tables 6, 10). Furthermore, it was indicate that both females taught inductively and deductively improved in the way of grammar learning but there was no significant difference between these two cases, too (tables 8, 12).

With respect to the third research question, it was also revealed (table 17) that deductive teaching mode was appropriate and workable in both genders whether the participants were field- dependent or field- independent while, in

two cases, inductive teaching approach did not showed itself effective when the participants were male with field dependent cognitive style as well as when they were female with field- independent cognitive style.

VIII. PEDAGOGICAL IMPLICATIONS

The findings of this study may entail some green and red lights for teachers occupied in EFL/ESL contexts while outlining and conducting grammar classes. In line with the findings of this study, deductive teaching mode is the most safe and appropriate approach to teach grammar in EFL contexts, at least, when teaching English Complex Structures in Iran, since the findings revealed this mode suitable for all males and females participants even with any kind of cognitive style. Besides, the finding of this study also implies that though both methods showed themselves effective, the teachers should be very cautious when teaching males with FD cognitive style and those female students with FI cognitive style.

IX. LIMITATIONS OF STUDY

The first salient but not aborting limitation arose from the shortage of subjects to take part in our study turning the process of data collection into a dilemma to us. This issue was descended from the fact that such a sample enough couldn't be found at a university with the same prior knowledge and cultural back ground. The next limitation ensued from telling the reality (purpose) that would send the participants into reluctance to continue along with researcher; therefore researchers had to utilized different incentives to convince them.

The last limitation resulted from the unfamiliarity of inductive mode to Iranian EFL participants. To some extent, the majority, they did not trust in it and considered it as confusing.

X. SUGGESTIONS FOR FURTHER STUDIES

By dint of the fact that our study worked on four variables, and to answer the third research question on six variables, it could be more safe and reliable to replicate it in another EFL context, or at least, narrow the scope of research (topic) and conduct it in two different studies each working on particular variables. It may yield more reliable results to research questions. The other suggestion is to change the focus of grammar by substituting it for a more simple grammar when conducting the study in an elementary or high school EFL context.

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