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## **A Comparative Study of the Effect of Explicit-inductive and Explicit-deductive Grammar Instruction in EFL Contexts**

**A Case Study of Persian Learners of English**

**Syed Jalal Abdolmanafi Rokni, Ph.D. Candidate**

# A Comparative Study of the Effect of Explicit-inductive and Explicit-deductive Grammar Instruction in EFL Contexts

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### Abstract

This paper intends to study the effect of explicit-inductive and explicit-deductive grammar instruction on the acquisition of relative clauses by Persian learners of English. The two intact classes were randomly assigned to one of the treatments, inductive or deductive.

Both groups received instruction about English relative clauses using the explicit-inductive (experimental group), or the explicit-deductive (control group). They were administered three similar but not identical tests namely, a pretest, posttest, and a delayed posttest containing Sentence Combining Test and Grammaticality Judgment Test.

The findings displayed that both groups significantly increased their overall learning outcomes from the pretest to the posttest, but the experimental group scored significantly higher than the control group. Also, both groups scored consistently higher on the GJT than on the SCT, but the experimental group scored significantly higher than the control group on both the SCT and the GJT.

**Key words:** explicit-inductive, explicit-deductive, relative clauses

### Introduction

The debate of grammar teaching has been an on-going one for over 2000 years (Howart, 1984). The need for grammar instruction is once again attracting the attention of second language acquisition (SLA) researchers and teachers (Nassaji & Fotos, 2004). There is now convincing indirect and direct evidence to support the teaching of grammar (R. Ellis, 2006). Ellis stipulated that grammar teaching can help students enhance both their language proficiency and accuracy, facilitate the internalization of the syntactic system of the second or foreign language, and also supplement the development of fluency.

Moreover, grammar teaching can contribute to both “acquired knowledge as well as learned knowledge” (Ellis). In addition, Celce-Murcia (1991) claims that because these “explicit, direct grammatical elements are gaining significance in teaching communicative abilities and skills” (as cited in Li, 1998).

Further, grammar is thought to furnish the basis for a set of language skills: listening, speaking, reading and writing. In listening and speaking, grammar plays a crucial part in grasping and expressing spoken language (e.g. expressions) since learning the grammar of a language is considered necessary to acquire the capability of producing grammatically acceptable utterances in the language (Corder, 1988).

In reading, grammar enables learners to comprehend sentence interrelationship in a paragraph, a passage and a text. In the context of writing, grammar allows the learners to put their ideas into intelligible sentences so that they can successfully communicate in a written form. Lastly, in the case of vocabulary, grammar provides a pathway to learners how some lexical items should be combined into a good sentence so that meaningful and communicative statements or expressions can be formed (Widodo, 2006).

### **The Instructional Approaches**

The instructional approaches to grammar commonly assume that “focusing on linguistic form aids the acquisition of grammatical knowledge” and this assumption has been true for both inductive and deductive methods of L2 grammar teaching (Cadierno-Lopez, 1992).

Depending on various situations in their EFL classrooms, EFL teachers have employed one of the two subtypes of explicit instructional approaches to L2 grammar: an explicit-deductive method, in which foreign language teachers apply a general grammatical rule or pattern to particular examples of a grammatical point, and which involves rule explanations at the beginning of the grammar lesson before students engage in language practice (Shaffer, 1989; Green & Hecht, 1992), and an explicit-inductive method, in which students are first exposed to sufficient examples of language use of a grammatical point, generate rules or patterns, directly attend to particular forms, and try to arrive at metalinguistic generalizations on their own (Rosa & O’Neil, 1999; Erlam, 2003; Kim, 2007).

### **Explicit-Inductive *versus* Explicit-Deductive Instruction**

Due to conflicting debates in the previous research on two different types of L2 grammar instruction methods, the explicit-inductive versus explicit-deductive instruction and being a teacher for over ten years getting involved with the problem of presenting grammar in an EFL context in Iran, I was determined to investigate the comparative effects of these two instructional types in Iranian university-level learners.

One way this can be done is by focusing on one grammatical point, using English relative clauses in order to investigate which instructional approach, explicit-inductive or explicit-deductive, is more effective for both the accurate production and correct judgment of the grammatical point. This will provide information as to what the better way is to help Iranian university-level learners improve grammatical competence for SLA, and to suggest better implications for L2 grammar instruction in the Iranian university and also high school-level classroom contexts.

### **Explicit and Implicit Methods**

Presenting new rules or patterns about L2 grammar structures, teachers have commonly used two specific types of grammar teaching methods explicit or implicit.

Since in implicit instruction method “no overt mention of the target grammatical point” (as cited in Fotos, 2002) is made and it also is dependent on the learners’ access to abundant in-class communicative materials containing the target structures (Fotos), recently, many studies have reported the strong evidence showing the superiority of explicit grammar instruction over implicit instructional approaches to grammar in EFL contexts (DeKeyser, 1997). Explicit grammar instruction is an instructional method which involves explanation and practice/experience processing input data (VanPatten & Cadierno, 1993).

As Fotos (2002) claimed learners benefit from explicit grammar instruction prior to implicit-focused activities because it helps them activate their metaknowledge about the rules or patterns of the targeted structures, promote their attention to the forms they will encounter, and promote high levels of accuracy in the target structures when communicative opportunities to encounter target forms are abundant.

### **The Purpose of This Study**

The purpose of this study was to investigate whether there was a significant difference between the two different types of pedagogical approaches to L2 grammar in Iranian university-level learners regarding the acquisition of English relative clauses. The results of the present study provided pedagogical implications for L2 grammar acquisition for Iranian high school and university-level teachers.

This study was an extension as well as a continuance of previous studies by Abraham, 1985; Rosa and O’Neil, 1999; Erlam, 2003; Seliger, 1975; Shaffer, 1989; Al-Kharat, 2000 and Kim, 2007 on the effects of deductive and inductive approaches on grammar performance in university-level EFL classrooms. It also compared, for the first time, the effects explicit-inductive approach on Iranian student’s acquisition of relative clauses against a traditional explicit-deductive approach.

## Relativization

The focus of instruction in study is English relativization. Relativization is chosen as the target of instruction in SLA research. The formation of relative clauses appears as a grammar item in second-year high schools in Iran briefly for the first time.

Relativization is often considered to be the last hurdle for students to overcome because it involves complex grammatical rules (Yabuki-Soh, 2007). Because L2 learners can carry out basic communication without relative clauses, they tend to avoid using them (e.g., Schachter, 1974). Relativization, however, becomes an important grammatical subsystem for L2 learners when they wish to describe situations or express themselves in depth using complex, multiple-clause sentences as opposed to simple, single-clause sentences.

Relative clause (RC) is a noun-modifying construction resulting in the generation of a higher level noun phrase. Celce-Murcia & Larsen-Freeman (1999) define a RC as “a type of complex postnominal adjectival modifier that is used in both written and spoken English” (p. 571). They further explain “RCs give a means to encode complex adjectival modifiers that are easier to produce than complex attributive structures and that are less wordy than two independent clauses” (p. 571). Therefore, a RC is formed based on the relationship of more than one sentence, where the relationship is the result of *embedding* (p. 572) or the creation of one clause within another higher-order clause.

Celce-Murcia & Larsen-Freeman (1999) present four common types of relative clause structures that relate the function of the head noun/antecedent in the main clause with the function of the relative pronoun in the adjective clause (p. 577).

- Subject-subject (SS) relatives: *The girl [who speaks Persian] is my cousin.*
- Object-subject (OS) relatives: *I know the girl [who speaks Persian].*
- Subject-object (SO) relatives: *The man [whom you met] is my teacher.*
- Object-object (OO) relatives: *I read the book [that you mentioned].*

## Research Questions

To investigate which instructional method, the explicit-inductive or explicit-deductive instructional approach, is more effective for grammar teaching and learning four research questions in this comparative study are suggested as follows:

1. Are there any significant differences among the overall learning outcomes of explicit-inductive instruction versus explicit-deductive instruction for the acquisition of English relative clauses in Iranian university-level learners?

2. Are there any significant differences among the overall learning outcomes of the Sentence Combining Test (SCT) and the Grammaticality Judgment Test (GJT) on English relative clauses in Iranian university-level learners?

## **Method**

### ***Participants***

The participants consist of 110 Iranian EFL students studying non-major English at Azad University in Quamshar, Iran during the summer semester, 2009. Two intact classes, one experimental group (55 students) and one control group (55 students), who were homogenized after taking the proficiency test were formed. The students' first language was Persian. They learned EFL as a mandatory course since their junior high school period at the age of twelve. Subjects' ages ranged from 18 to 22 years old. They were all freshmen (first year students) who studied English for at least seven years. In order to control the participants' gender as a moderator variable the present researcher invited both genders into this study.

### ***Instructional Treatments***

During all treatments in this study, the experimental group received an explicit-inductive instruction that advocated by a number of researchers (Al-Kharrat, 2000; Erlam, 2003; Herron & Tomasello, 1992; Seliger, 1975; Shaffer, 1989) and more specifically designed and modified by Kim (2007).

In this current method, subjects had no formal and direct instruction during the treatments, in which the teacher did not give the experimental class any rule explanations or metalinguistic information about the target structure during all treatments. Also, to control the variable of teacher's behavior and bias in the experiment, the teacher was not used for teaching the lessons in the experiment.

The essential role of the teacher in the experimental class was giving the experimental class an explicit corrective feedback about the rule explanations or patterns found by the students in order to help students reformulate their rules or patterns of the target structure.

On the other hand, the control group received an explicit-deductive instruction as the inductive group's counterpart. This method has been traditionally used as instructional approaches to L2 grammar in the EFL countries (Shaffer, 1989); thus, students in the control group did not have difficulty performing these instructional approaches.

The treatment used for the control group was similar to the deductive method designed by a number of researchers (Al-Kharrat, 2000; Erlam, 2003; Herron & Tomasello, 1992; Seliger, 1975; Shaffer, 1989; Kim, 2007). This method was characterized by the step-by-step rule-first presentation of the language rule before drill and practice (Seliger).

However, this current study involved more guided and modified explicit-inductive instruction, in which students first (1) received ample written example sentences including target structures without any direct instructions; (2) creatively discovered the rule or pattern; (3) formulated the rule or pattern themselves; (4) stated it; and (5) finally verbalized their own explanations or hypotheses. Also, the teacher (1) presented the rule or pattern about the target structure at the end of all activities, and (2) gave explicit corrective feedback to the students at the end of all activities (Kim, 2007).

In a way, the present study uses a grammar consciousness-raising task in the explicit-inductive (focus on form) group to facilitate the acquisition of relative clauses. According to the literature in the field of foreign language instruction, a grammar consciousness-raising task is one of several teaching tools that can be used in a type of focus on form instruction (Ellis, 1991; Fotos, 1994).

It was hoped that learners would develop knowledge of relative clauses and would become more aware of the feature in communicative input afterwards - a process that Sharwood Smith (1993) also see as essential for language acquisition. Similarly, according to Schmidt's (1990) Noticing Hypothesis, awareness of specific linguistic items in the input is necessary for language learning to occur.

The explicit-deductive (focus on forms) group received teacher-centered instruction and rules were explained in the students' native language. The instructional treatment consisted in a systematic attention to the relative clauses in a traditional sense. The two groups had an equal amount of instruction, four lessons, eight sessions, for 60 minutes over the period of two weeks, during the regular classes from the same instructor, that is, the researcher.

### ***Instruments***

#### ***A) Proficiency Test***

For all four of these tests, test materials were designed as a means to assess the proficiency level, the production and judgment of the targeted structure. In order to make sure of the homogeneity of the control and experimental groups in terms of English language proficiency, a test of NELSON, series 400B, after being piloted on a similar group of fifteen students, was administered one day before the pretest. It consisted of 50 multiple-choice items in four parts of cloze tests, grammar, vocabulary and pronunciation. The time allotted was 40 minutes.

#### ***B) Sentence Combining Test (SCT)***

Sentence combination is a typical type of elicitation which researchers use in eliciting relative clauses. Quite a number of previous studies adopted this to collect data concerning relative clauses (Flanigan, 1995; Gass, 1979, 1980; Izumi, 2003; Eckman, Bell, & Nelson, 1988;



Hamilton, 1994). In these tests, 20 sets of two sentences which could be combined into one sentence by using one of the four basic types of relative clauses namely, SO, OO, SS, and OS were administered.

### *C) Grammaticality Judgment Test (GJT)*

The GJT consisted of 24 sentences for each test. Out of 24 items, 12 sentences were ungrammatical, while the rest were grammatical. In ungrammatical sentences, four types of common errors of relative clauses as suggested by Izumi (2001) were involved: (1) pronoun retention, (2) incorrect relative-marker morphology (3) inappropriate relative-marker omission, and (4) nonadjacency.

### ***Procedures***

The present researcher applied truly experimental (control group) design. The reasons behind choosing this design were as follows: (1) to compare participant groups prior to the treatment (2) to measure the effect of treatment. In this study, a cluster random sampling was used to collect data. Two classes with 110 students have been the unit of sampling.

To achieve the aim of the study, besides the proficiency test which was performed to homogenize the group, the subjects were administered three similar but not identical tests: one pretest, one posttest, and one delayed posttest. The proficiency test along with the pretest was carried out one day before the instruction, the posttest was conducted one day after all of the instructional treatments, and the delayed posttest was administered four weeks after all of the instructional treatments. All tests consisted of both the sentence combining test (SCT) and the grammaticality judgment test (GJT).

## **Results**

### ***Overall Learning Outcomes***

#### *Combined Scores of SCT Plus GJT*

To investigate a significant difference in overall learning outcomes between the experimental (n=55) and control (n=55) groups, the t-tests of independent samples were conducted on the combined mean scores of the SCT and the GJT measured in three tests. The results of the descriptive and inferential statistics calculated from the combined mean scores of the SCT and the GJT in the experimental and control groups are reported in Table 1.

Table 1

#### *Descriptive and Inferential Statistics on the Combined Mean Scores of the SCT and the GJT for the Experimental and Control Groups*



Tests	Experimental Group (n = 55)		Control Group (n = 55)		MD	Difference	
	M	SD	M	SD		T	p
Pretest	25.08	3.95	23.80	3.57	1.28	0.785	.434
Posttest	65.70	6.01	51.61	4.94	14.09	5.914	.000*
Delayed posttest	64.04	6.23	50.04	4.49	14.00	5.950	.000*

\*p<.001

The major findings show that both groups significantly increased their overall learning outcomes as a result of the treatments involving the SCT and the GJT, but that the experimental group had higher overall learning outcomes on both the SCT and the GJT than the control group. Also, both groups increased significantly greater from the pretest to the posttest on both the SCT and the GJT, while there was not a significant increase from the posttest to the delayed posttest.

Therefore, the learning that was acquired as a result of the treatment was maintained over time as explicit knowledge for both groups. These findings indicate that the explicit-inductive instruction treated in the experimental class was more effective than the traditional explicit-deductive instruction administered to the control class.

To examine the overall learning outcomes of the SCT and the GJT in the experimental group, the raw scores and percentages of correct answers on the SCT and the GJT tests in the experimental group were calculated. So, paired t-tests of dependent samples were conducted to test significant differences between the pretest and posttest, the pretest and delayed posttest, and the posttest and delayed posttest on the total scores of the SCT and the GJT in the experimental group (Table 2).

Table 2

*Descriptive and Inferential Statistics on Overall Scores of the SCT and the GJT for the Experimental Group*

Comparing Tests		Experimental Group (n = 55)					Difference	
		Raw Scores		M	SD	MD		
		SCT (n = 1100)	GJT (n = 1320)				T	p
Pretest vs. Posttest	Pretest	(216) 19.6	(391) 29.6	24.6	3.95	40.95	19.940	.000*
	Posttest	(703) 63.9	(887) 67.2	65.55	6.01			
Pretest vs. Delayed Posttest	Pretest	(216) 19.6	(391) 29.6	24.6	3.95	39.2	19.118	.000*
	Delayed posttest	(673) 61.2	(877) 66.4	63.8	6.23			
Posttest vs. Delayed	Posttest	(703) 63.9	(887) 67.2	65.55	6.01	-2.55	1.199	.236
	Delayed	(673)	(877)	63.8	6.23			

Posttest	Posttest	61.2	66.4					
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Note: SCT (n=1100) = Experimental Group (n=55) x SCT (n=20), and GJT (n=1320) = Experimental Group (n=55) x GJT (n=24). \*p<.001

The major findings indicate that the experimental group significantly increased the overall learning outcomes from the pretest to the posttest and the delayed posttest involving the SCT and the GJT after all treatments, but the experimental group had higher overall learning outcomes on the GJT than on the SCT in all three tests.

To investigate overall learning outcomes on the SCT (n=1100) and the GJT (n=1320) in the control group (n=55), the raw scores and percentages for the combined scores of the SCT and the GJT of correct answers on the pretest, posttest, and delayed posttest are presented. Moreover, paired t-tests of dependent samples were conducted to test significant differences of the total mean scores of the SCT and the GJT on three tests in the control group (Table 3).

Table 3  
*Descriptive and Inferential Statistics on Overall Scores of the SCT and the GJT for the Control Group*

Comparing Tests		Control Group (n=55)					Difference	
		Raw Scores		M	SD	MD	T	p
		SCT (n = 1100)	GJT (n = 1320)					
Pretest vs. Posttest	Pretest	(199) 18.1	(377) 28.6	23.35	3.57	28.25	15.040	.000*
	Posttest	(569) 51.7	(680) 51.5	51.6	4.94			
Pretest vs. Delayed Posttest	Pretest	(199) 18.1	(377) 28.6	23.35	3.57	26.65	14.436	.000*
	Delayed posttest	(547) 49.7	(664) 50.3	50.00	4.49			
	Posttest	(569)	(680)	51.6	4.94			

vs. Delayed Posttest		51.7	51.5			-1.6	1.963	.055
	Delayed Posttest	(547) 49.7	(664) 50.3	50.00	4.49			

Note: SCT (n=1100) = Experimental Group (n=55) x SCT (n=20), and GJT (n=1320) = Experimental Group (n=55) x GJT (n=24). \*p<.001

The major findings indicate that the control group significantly increased the overall learning outcomes on both the SCT and GJT after all treatment, but that the control group had higher learning outcomes on the GJT than on the SCT in all three tests.

### *Combined SCT and GJT Gain Scores*

Table 4 summarizes the descriptive and inferential statistics conducted to test significant differences on the combined gain scores of the SCT and the GJT in the posttest subtracted by the pretest (posttest-pretest), the delayed posttest subtracted by the pretest (the delayed posttest-pretest), and the delayed posttest subtracted by the posttest (the delayed posttest-posttest) between the experimental and control groups.

Table 4

*Descriptive and Inferential Statistics of Combined Gain Scores of the SCT and GJT for the Experimental and Control Groups*

Tests	Experimental Group (n = 55)		Control Group (n = 55)		MD	Difference	
	M	SD	M	SD		t	p
Posttest-Pretest	40.62	6.65	27.39	6.03	13.23	4.656	.000*
Delayed Posttest-Pretest	39.13	6.65	26.16	5.93	12.97	4.600	.000*
Delayed Posttest-Posttest	-1.66	4.49	-1.57	2.61	0.09	0.052	.959

\*p<.001

The findings show that there was a significant difference between the experimental and control groups in the posttest-pretest total gain scores (t=4.656, p<.001), and the delayed posttest-pretest total gain scores (t=4.600, p<.001) on the combined SCT and GJT gain scores, but that there was no significant difference between the experimental and control groups in the combined gain scores of the delayed posttest-posttest of the SCT and GJT (t=0.502, p>.05).

### *SCT Learning Outcomes*

#### *SCT Scores*

To investigate significant differences in overall learning outcomes on the SCT between the experimental and control groups, t-tests of independent samples were conducted in the total

mean scores of the SCT obtained from the three tests between the experimental and control groups (Table 5)

Table 5  
*Descriptive and Inferential Statistics on the SCT for the Experimental and Control Groups*

Tests	Experimental Group (n=55)		Control Group (n=55)		MD	Difference	
	SCT		SCT			T	P
	M	SD	M	SD			
Pretest	19.64	2.89	18.09	2.56	1.55	0.595	.553
Posttest	63.91	3.70	51.61	3.35	12.30	3.625	.000*
Delayed Posttest	61.18	4.26	49.73	3.47	11.45	3.094	.003**

\*p<.001, \*\*p<.05

The major findings show that both groups significantly increased their overall learning outcomes on the SCT, but that the experimental group had higher learning outcomes than the control group on the SCT as a result of the treatment.

To test significant differences among the three tests of the SCT in the experimental group, paired t-tests of dependent samples were conducted between the pretest and posttest, the pretest and delayed posttest, and the posttest and delayed posttest (Table 6).

Table 6  
*Descriptive and Inferential Statistics on the SCT for the Experimental Group*

Comparing Tests		Experimental Group (n = 55)							Difference	
		Raw Scores (%) (N = 1100)				M	SD	MD	t	p
		OS (n = 275)	OO (n = 275)	SS (n = 275)	SO (n = 275)					
Pretest	Pretest	(96)	(58)	(36)	(26)	19.65	2.89			

vs. Posttest		34.9	21.1	13.1	9.5			44.28	14.200	.000*
	Posttest	(212) 77.1	(184) 66.9	(158) 57.5	(149) 54.2	63.93	3.70			
Pretest vs. Delayed Posttest	Pretest	(96) 34.9	(58) 21.1	(36) 13.1	(26) 9.5	19.65	2.89	41.53	12.191	.000*
	Delayed Posttest	(206) 74.9	(175) 63.6	(149) 54.2	(143) 52	61.18	4.26			
Posttest vs. Delayed Posttest	Posttest	(212) 77.1	(184) 66.9	(158) 57.5	(149) 54.2	63.93	3.70	2.75	1.023	.311
	Delayed Posttest	(206) 74.9	(175) 63.6	(149) 54.2	(143) 52	61.18	4.26			
Total Average % (n = 275)		(171) 62.0	(139) 50.5	(114) 41.6	(106) 38.5					

Note: Raw Scores (N=1100) = OS (n=275) + OO (n=275) + SS (n=275) + SO (n=275). OS (n=275) = Experimental Group (n=55) x OS (n=5). OO (n=275) = Experimental Group (n=55) x OO (n=5). SS (n=275) = Experimental Group (n=55) x SS (n=5). SO (n=275) = Experimental Group (n=55) x SS (n=5). \*p<.001

The major findings show that the experimental group significantly increased the overall learning outcomes on the SCT as a result of the treatments, but the experimental group had higher learning outcomes from the pretest to the posttest than from the pretest to the delayed posttest, and from the posttest to the delayed posttest.

To test significant differences on the SCT in the control group, paired t-tests of dependent samples were conducted on the total mean scores of the SCT in the control group between the pretest and posttest, the pretest and delayed posttest, and the posttest and delayed posttest (Table 7)

Table 7  
*Descriptive and Inferential Statistics on the Overall Mean Scores of the SCT for the Control Group*

Comparing	Control Group (n = 55)				Difference
	Raw Scores (%)				

Tests		(N = 1100)				M	SD	MD		
		OS (n = 275)	OO (n = 275)	SS (n = 275)	SO (n = 275)				t	P
Pretest vs. Posttest	Pretest	(90) 32.7	(55) 20.0	(32) 11.6	(22) 8	18.09	2.57	33.54	11.624	.000*
	Posttest	(182) 66.2	(150) 54.5	(124) 45	(113) 41.1	51.63	3.35			
Pretest vs. Delayed Posttest	Pretest	(90) 32.7	(55) 20.0	(33) 11.6	(22) 8	18.09	2.57	31.63	10.230	.000*
	Delayed Posttest	(176) 64	(145) 52.7	(118) 42.9	(108) 39.3	49.72	3.47			
Posttest vs. Delayed Posttest	Posttest	(182) 66.2	(150) 54.5	(124) 45.1	(113) 41.1	51.63	3.35	-1.91	1.585	.119
	Delayed Posttest	(176) 64	(145) 52.7	(118) 42.9	(108) 39.3	49.72	3.47			
Total Average % (n = 275)		(149) 54.2	(117) 42.4	(91) 33.2	(81) 29.5					

Note: Raw Scores (N=1100) = OS (n=275) + OO (n=275) + SS (n=275) + SO (n=275) = Control Group (n=55) x OS (n=5). \*p<.001

The major findings show that the control group significantly increased the overall learning outcomes on the SCT, and that the control group had the highest learning outcomes on the SCT between the pretest and the posttest compared to between the pretest and the delayed posttest, and between the posttest and delayed posttest.

### ***SCT Gain Scores***

Table 8 presents the descriptive and inferential statistics measured to test significant differences of gain mean scores on the posttest subtracted by pretest (posttest-pretest), the delayed posttest subtracted by the pretest (delayed posttest-pretest), and the delayed posttest subtracted by the posttest (delayed posttest-posttest) of the SCT between the experimental and control groups.

Table 8

*Descriptive and Inferential Statistics of Gain Mean Scores on the SCT for the Experimental and Control Groups*

Tests	Experimental Group (n = 55)		Control Group (n = 55)		MD	Difference	
	M	SD	M	SD		t	P
Posttest-Pretest	44.27	4.62	33.64	4.25	10.63	2.511	.014*
Delayed-Pretest	41.54	5.05	31.64	4.55	9.90	2.161	.033*
Delayed-Posttest	-2.73	3.95	-2.00	1.87	-0.73	0.247	.806

\*p<.05

The findings show that the p-value approached significance between the two groups in the posttest-pretest gain mean scores (t=2.511, p<.05) on the SCT. On the other hand, the findings indicate that there was a significant difference between the two groups in the delayed posttest-pretest gain mean scores (t=2.161, p<.05) on the SCT.

### ***GJT Learning Outcomes***

#### ***GJT Scores***

To examine the GJT learning outcomes of the experimental and control groups, t-tests of independent samples were conducted on the total mean scores of the GJT in the experimental and control groups (Table 9).

Table 9

*Descriptive and Inferential Statistics on the GJT for the Experimental and Control Groups*

Tests	Experimental Group (n = 55)		Control Group (n = 55)		MD	Difference	
	GJT		GJT			t	P
	M	SD	M	SD			
Pretest	29.62	2.55	28.56	2.31	1.06	0.547	.585
Posttest	67.20	3.51	51.52	3.63	15.68	5.528	.000*
Delayed Posttest	66.43	3.00	50.30	3.46	16.13	6.271	.000*

\*p<.001

The major findings show that both groups significantly increased more on the GJT, but the experimental group had higher learning outcomes than the control group on the GJT.

To examine the GJT learning outcomes of the experimental group, the raw scores and percentages of correct answers for identification of four types of common errors of relative clauses, pronoun retention (ET-1), incorrect relative-marker morphology (ET-2) inappropriate relative-marker omission (ET-3) and nonadjacency (ET-4), were calculated. Also, paired t-tests of dependent samples were conducted to test whether there were significant differences on the GJT between the pretest and posttest, the pretest and delayed posttest, and the posttest and



delayed posttest in the experimental group (Table 10).

Table 10

*Descriptive and Inferential Statistics on the GJT for the Experimental Group*

Comparing Tests		Experimental Group (n = 55)							Difference	
		Raw Scores (%) (N = 1320)				M	SD	MD		
		ET-1 (n = 165)	ET-2 (n = 165)	ET-3 (n = 165)	ET-4 (n = 165)					
Pretest vs. Posttest	Pretest	(81) 49.1	(59) 35.8	(45) 27.3	(32) 19.4	29.62	2.56	37.58	18.278	.000*
	Posttest	(138) 83.6	(118) 71.5	(104) 63	(90) 54.5	67.20	3.51			
Pretest vs. Delayed Posttest	Pretest	(81) 49.1	(59) 35.8	(45) 27.3	(32) 19.4	29.62	2.56	36.81	18.286	.000*
	Delayed Posttest	(135) 81.8	(117) 71.5	(102) 61.8	(88) 53.3	66.43	3.00			
Posttest vs. Delayed Posttest	Posttest	(138) 83.6	(118) 71.5	(102) 63	(90) 54.5	67.20	3.51	-0.77	0.549	.586
	Delayed Posttest	(135) 81.8	(117) 70.9	(102) 61.8	(88) 53.3	66.43	3.00			
Total Average % (n = 165)		(118) 70.5	(98) 59.4	(83) 50.7	(70) 42.4					

Note: Raw Scores (N=1320) = ET-1 (n=165) + ET-2 (n=165) + ET-3 (n=165) + ET-4 (n=165) = Experimental Group (n=55) + ET-1 (n=3). ET-1 is pronoun retention; ET-2 is incorrect relative-marker morphology; ET-3 is incorrect relative-marker omission; and ET-4 is nonadjacency. \*p<.001

The major findings show that the experimental group significantly increased the overall learning outcomes on the GJT as a result of the treatment, but that the experimental group had the highest learning outcomes between the pretest and the posttest on the GJT compared to between the pretest and delayed posttest, or the posttest and delayed posttest.

To test significant differences between the pretest and posttest, the pretest and delayed posttest, and the posttest and delayed posttests on the GJT in the control group, paired t-tests of dependent samples were conducted in the GJT mean scores (Table 11).

Table 11

*Descriptive and Inferential Statistics on the GJT for the Control Group*

Comparing Tests		Control Group (n = 55)							Difference	
		Raw Scores (%) (N = 1320)				M	SD	MD		
		ET-1 (n = 165)	ET-2 (n = 165)	ET-3 (n = 165)	ET-4 (n = 165)				t	p
Pretest vs. Posttest	Pretest	(77) 46.1	(57) 34.5	(44) 26.7	(31) 18.8	28.56	2.31	22.96	9.383	.000*
	Posttest	(108) 65.5	(89) 53.9	(76) 46.1	(65) 39.4	51.52	3.63			
Pretest vs. Delayed Posttest	Pretest	(77) 46.1	(57) 34.5	(44) 26.6	(31) 18.8	28.56	2.31	21.74	8.890	.000*
	Delayed Posttest	(104) 63	(86) 52.1	(72) 43.6	(61) 36	50.30	3.46			
Posttest vs. Delayed Posttest	Posttest	(108) 65.5	(89) 53.9	(76) 46.1	(65) 39.4	51.52	3.63	-1.22	1.152	.254
	Delayed Posttest	(104) 63	(86) 52.1	(72) 43.6	(61) 36	50.30	3.46			
Total Average % (n = 165)		(96) 58.4	(77) 46.9	(64) 38.8	(52) 31.7					

Note: Raw Scores (N=1320) = ET-1 (n=165) + ET-2 (n=165) + ET-3 (n=165) + ET-4 (n=165) = Experimental Group (n=55) + ET-1 (n=3). ET-1 is pronoun retention; ET-2 is incorrect relative-marker morphology; ET-3 is incorrect relative-marker omission; and ET-4 is nonadjacency.  
\*p<.001

The major findings show that the control group significantly increased the overall learning outcomes on the GJT as a result of the treatment, and that the control group had the highest learning outcomes on the GJT from the pretest to the posttest compared to between the pretest and the delayed posttest, or the posttest and the delayed posttest.

*GJT Gain Scores*

Table 12 presents the descriptive and inferential statistics conducted on the GJT gain mean scores to test significant differences in the posttest subtracted by the pretest (posttest-pretest), the delayed posttest subtracted by the pretest (the delayed posttest-pretest), and the delayed posttest subtracted by the posttest (the delayed posttest-posttest) between the experimental and control groups.

Table 12

*Descriptive and Inferential Statistics of Gain Scores on the GJT for the Experimental and Control Groups*

Tests	Experimental Group (n = 55)		Control Group (n = 55)		MD	Difference	
	M	SD	M	SD		T	P
Posttest-Pretest	37.58	3.66	22.96	4.35	14.62	4.576	.000*
Delayed-Pretest	36.81	3.58	21.74	4.35	15.07	4.759	.000*
Delayed-Posttest	-0.77	2.46	-1.22	1.87	0.45	0.262	.794

\*p<.001

The findings show that there was a significant difference in the posttest-pretest gain mean scores ( $t=2.882$ ,  $p<.01$ ) and delayed posttest-pretest gain mean scores ( $t=4.759$ ,  $p<.001$ ) on the GJT between the experimental and control groups, but that there was no significant difference in the delayed posttest-posttest ( $t=0.262$ ,  $p>.05$ ) for the GJT between the experimental and control groups.

In summary, both groups had significantly greater overall learning outcomes on the GJT as a result of treatment. However, the experimental group increased significantly greater than the control group on the GJT. These findings illustrate that the explicit inductive instruction administered to the experimental group was more effective on the GJT than the traditional explicit-deductive instruction treated in the control group.

### ***Similarities and Differences between the SCT and the GJT***

This section presents the similarities and differences between the overall learning outcomes of the SCT and the GJT of the experimental and control groups. Table 13 displays the mean scores of the SCT and the GJT of the experimental and control groups.

Table 13

*The SCT and GJT Mean Scores for the Experimental and Control Groups*

	SCT		GJT	
	Experimental	Control	Experimental	Control

Tests	Group (n=55)	Group (n=55)	MD	Group (n=55)	Group (n=55)	MD
	M	M		M	M	
Pretest	19.64	18.09	1.55	29.62	28.56	1.06
Posttest	63.91	51.73	12.18	67.20	51.52	15.68
Delayed Posttest	61.18	49.73	11.45	66.43	50.30	16.13
Average Mean	48.24	39.85	8.39	54.42	43.46	10.96

The findings show that the SCT was more difficult than the GJT in all three tests of both the experimental and control groups. In the pretest, the two groups show higher mean scores on the GJT than on the SCT. These results indicate that students participating in this present study had better metalinguistic knowledge and proficiency level on the GJT for the comprehension or identification of the targeted structure, relative clauses than on the GJT for the production of the targeted structure, relative clauses.

Also, on the posttests and delayed posttests, both groups show higher mean scores on the GJT than on the SCT. These results demonstrate that the instructional treatments were more effective for the GJT than for the SCT. Therefore, the results of overall learning outcomes on the SCT and the GJT indicate that the comprehension or identification of the targeted structure, relative clauses, was easier than the production of relative clauses in Iranian university-level EFL learners.

## Discussion

Regarding the Research Question 1, “Are there any significant differences among the overall learning outcomes of explicit-inductive instruction versus explicit-deductive instruction for the acquisition of English relative clauses in Iranian university-level EFL learners?”, the findings show that both groups significantly increased their overall learning outcomes as a result of the treatment, but the experimental group had significantly higher overall learning outcomes than the control group as a result of the treatment.

More specifically, the findings indicate that on the SCT and the GJT tests of the experimental group there was a significant difference between the pretest and posttest ( $t=19.940$ ,  $p<.001$ ), and between the pretest and delayed posttest ( $t=19.118$ ,  $p<.001$ ), but that there was no significant difference between the posttest and delayed posttest ( $t=1.199$ ,  $p>.05$ ).

On the other hand, the findings indicate that on the SCT and the GJT of the control group there was a significant difference between the pretest and posttest ( $t=15.040$ ,  $p<.001$ ), and between the pretest and delayed posttest ( $t=14.436$ ,  $p<.001$ ), while there was no significant difference from the posttest to the delayed posttest ( $t=1.963$ ,  $p>.05$ ).

Yet, the results demonstrate that there was no significant difference between the pretests of the experimental and control groups on the SCT and the GJT ( $t=0.785$ ,  $p>.05$ ), but that there was a significant difference between the posttests ( $t=5.914$ ,  $p<.001$ ), and between the delayed posttests ( $t=5.950$ ,  $p<.001$ ) of the experimental and control groups on the SCT and GJT.

These results demonstrate that while two groups were initially at a similar proficiency level of the targeted structure, relative clauses, and the effects of instruction occurred in both groups, the experimental group performed significantly better on both the SCT and the GJT than the control group. Therefore, the treatment in the experimental group, an explicit-inductive instruction, was more effective than the traditional explicit-deductive instruction treated in the control group.

Regarding the Research Question 2, “Are there any significant differences among the overall learning outcomes of the sentence combining test (SCT) and the grammaticality judgment test (GJT) of English relative clauses in Iranian university-level EFL learners?”, the results show that both groups had higher overall learning outcomes on the GJT than on the SCT as a result of the treatment, but that the experimental group had significantly higher overall learning outcomes on both the GJT and the SCT than the control group.

More specifically, the findings show that on the SCT tests of the experimental group there was a significant difference between the pretest and posttest ( $t=14.200$ ,  $p<.001$ ), and between the pretest and delayed posttest ( $t=12.191$ ,  $p<.001$ ), but that there was no significant difference from the posttest to the delayed posttest ( $t=1.023$ ,  $p>.05$ ).

Also, subjects in both groups scored better on the GJT. On the other hand, the findings indicate that on the SCT tests of the control group there was a significant difference from the pretest to the posttest ( $t=11.624$ ,  $p<.001$ ), and from the pretest to the delayed posttest ( $t=10.230$ ,  $p<.001$ ), while there was no significant difference between the posttest and delayed posttest ( $t=1.585$ ,  $p>.05$ ).

The findings show that while there was no significant difference between the pretests ( $t=0.595$ ,  $p>.05$ ) of the experimental and control groups, there was a significant difference between the posttests ( $t=3.625$ ,  $p<.001$ ), and between the delayed posttests ( $t=3.094$ ,  $p<.05$ ) of the experimental and control groups on the SCT.

These results indicate that on the SCT, while two groups initially had a similar level of proficiency about the SCT, the experimental group performed significantly better than the control group; hence, an explicit-inductive instruction treated in the experimental group was more significantly effective on the SCT than a traditional explicit-deductive instruction treated in the control group.

Also, the findings show that on the GJT tests of the experimental group there was a significant difference between the pretest and posttest ( $t=18.278$ ,  $p<.001$ ), and between the pretest and delayed posttest ( $t=18.286$ ,  $p<.001$ ), but that there was no significant difference from the posttest

to the delayed posttest ( $t=0.549$ ,  $p>.05$ ).

The findings also indicate that on the GJT tests of the control group there was a significant difference between the pretest and posttest ( $t=9.383$ ,  $p<.001$ ), and between the pretest and delayed posttest ( $t=8.890$ ,  $p<.001$ ), while there was no significant difference between the posttest and delayed posttest ( $t=1.152$ ,  $p>.05$ ).

The findings indicate that in the two groups there was a significant difference between the posttests ( $t=5.528$ ,  $p<.001$ ), and between the delayed posttests ( $t=6.271$ ,  $p<.001$ ), while there was no significant difference between the pretests ( $t=0.547$ ,  $p>.05$ ). These results indicate that from the pretest to the posttest, the experimental group performed significantly better than the control group on the GJT; therefore, the instruction in the experimental group was more significantly effective than that in the control group.

Thus, these results conclude that the explicit-inductive instruction treated in the experimental group was more effective than the traditional explicit-deductive instruction conducted in the control group.

## Conclusion

From the findings, we can conclude that a new instruction method administered in the experimental group, an explicit-inductive instruction, was more effective on L2 grammar learning than a traditional method conducted in the control group, an explicit-deductive instruction. Also, there were highly significant differences on both instruments between the experimental and control group from the pretest to the posttest and delayed posttest, while both treatments conducted in the experimental and control group were effective on learning the targeted structure, relative clauses.

These results support Herron and Tomasello's (1992), Shaffer's (1989) and Kim's (2007) results that found the overall learning outcomes for inductive instruction. In addition, as shown in the results, this study shows that both treatments were given positive ratings.

Therefore, the results in this present study suggest an important implication that Iranian EFL university-level teachers need to re-consider their traditional explicit-deductive instruction method used in Iranian EFL university-level learners.

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