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The Influence of Task Complexity Manipulation on Iranian EFL Learners' Learning of Transitional Devices

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Abstract

Task complexity has recently attracted great attention in second language (L2) studies. However, its potential impacts on learning transitional devices have not been considered. The current study was an attempt to analyze the impacts of manipulating task complexity conditions on EFL learners' grammatical enhancement in terms of learning transitional devices through doing writing tasks. For this purpose, 75 intermediate EFL learners learning English in three English language institutes in Iran were randomly selected. They were assigned to four experimental groups and one control group (each with 15 participants). Each of the experimental groups was presented with a pretest, writing tasks, an immediate posttest and a delayed posttest. The participants took part in nine sessions and in each session,some transitional devices were introduced to the experimental groups with which they were supposed to write a paragraph based on a special topic using all those transitional devices. The different experimental groups received writing tasks with different complexity levels which were determined through the manipulation of factors including ± few elements and ± planning time. The participants in the control group just participated in a regular English class for nine sessions without doing such tasks. The performances of all groups were analyzed, and the findings revealed statistically significant differences among the five groups in both the immediate posttest and the delayed posttest, after controlling for the effect of the pretest. The findings of the current study have practical implications for curriculum development and EFL writing instruction.

Key words: learning transitional devices, task complexity manipulation, writing tasks

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INTRODUCTION

Among the four major skills of English language, writing is widely used for communication especially through the internet which is a significant communication tool (Kroll, 2003). Since English as the international language is widely used in written correspondence all over the world, a number of experts have emphasized the importance of being proficient in writing in this language (e.g., Naghdipour, 2016; Tuan, 2010). In addition, both language learners and instructors and even the researchers who conduct specialized studies on the writing skill try to identify effective and applicable methods to enhance writing as a multi-dimensional skill (Gunawardena, 2014; Hyland, 2013). Moreover, providing English learners with creative ways of improving their writing proficiency is necessary in academic settings. Persky et al. (2003) argued that writing is needed in many communication activities including essay writing for academic accomplishment, writing news in the press, or sending emails via the internet. As a result, the significance of writing skill for plenty of reasons such as educational and professional aims is considered a main aspect of L2 teaching (Dawn Sia & Cheung, 2017; Muller et al., 2017).

The need for employing creative instructional programs has made some researchers including Polio and Park (2016) focus on the necessity of using modern types of instructions to familiarize learners with effective ways of writing so that the learners can significantly make progress in this field. In order to provide EFL students with more communicative and creative courses some experts believe that exerting modern modes of language instruction such as task-based language teaching (TBLT) instead of traditional ones is of great significance (e.g., Dobao, 2012; Ellis, 2008). Nevertheless, Golparvar and Rashidi (2021) highlight that a large number of studies conducted on learning language through task-based instruction have concentrated on oral mode, while written production has not received enough attention by researchers. Furthermore, Allen (2018) remarked that even many of the instructional syllabuses that have focused on task-based

writing have ignored the developing significance of writing ability for L2 learners.

In fact, the present investigation explores the probable significant differences among the relative short-term and long-term effects of different task complexity conditions on EFL learners' learning of transitional devices. In the current study, both the number of elements involved in the tasks and the absence or presence of planning time are the factors that have determined the level of task complexity. Based on Ishikawa (2006), the level of complexity, accuracy and fluency in learners' written productions can enhance through doing tasks at different levels of complexity.

According to Ellis (2003), task complexity is known as the rate of simplicity and complexity related to the nature of a particular task. Actually, the concept of task complexity is regarded as a major concept needing attention in designing programs for educational purposes because it is essential that the materials be arranged in a way that leads to an increase in the quality of learning (Nunan, 1989). Skehan (1998a, 1998b) argued that familiarity with the notion of task complexity can assist both syllabus designers and L2 learners in having access to the necessary information regarding how much challenge a task presents to the students who are asked to perform it. As a result, conducting studies relevant to the link between the improvement of language production and task complexity in both written and oral modes can provide L2 learners and instructors with valuable information and can even make them familiar with the types of tasks that have great impacts in the procedure of learning how language can be produced in more effective ways.

Some studies on task complexity have been conducted in the field of writing to consider its effects on EFL learners' grammar development (e.g., Arjmand, 2017, Jung, 2020). However, there is a lack of knowledge regarding its potential effect on learning transitional devices through the performance of writing tasks with different complexity levels. Moreover, transitional devices constitute a crucial component of English grammar widely used in writing and play a noticeable role in the creation of cohesion

in text. Research (e.g., Cumming, Lai, & Cho, 2016; Darweesh & Kadhim, 2016) has shown that EFL learner face problems in the correct use of transitional devices. Therefore, the significance of the current study lies in promoting EFL learners' skills in writing cohesive texts. Research studies (e.g., Ellis & Yuan, 2004; Ong & Zhang, 2010, 2013) have revealed that learners' writing performance can be influenced by manipulating task complexity. However, to the best of the researchers' knowledge, the possible effect of task complexity manipulation on EFL learners' learning transitional devices has not been investigated.

Robinson (2003) argues that task complexity influences L2 Use, as well as L2 Learning. The Cognition Hypothesis makes predictions regarding the effects of task complexity on language performance, and comprehension, and about the effects on language learning. Following Robinson's predictions and the gap in the literature, the present study aims to investigate whether the manipulation of task complexity through ± few elements (whether the task requires the learners to focus on just one point or more points to do the task correctly) and ± planning time (whether the learners are supported with an amount of time to think about how to do the task before doing it) can have a significant impact on Iranian intermediate EFL learners' learning of transitional devices.

LITERATURE REVIEW

Theoretical Background

Authenticity of language is a particular aspect of task-based language teaching through which learners will be able to connect the knowledge they have acquired from the tasks in educational settings to what is needed in real-life conditions in a meaningful way (Nunan, 2004). This type of meaningful connection can be identified by learners and can lead to the enhancement of their learning quality (Long, 1991). Robinson (2003) argued that arranging and sequencing tasks can make them more similar to the situations in real world and this way L2 learners can succeed more

effectively in gaining the required performance objectives. Furthermore, Robinson (2001a) remarked that since L2 learners may be affected by the difficulties of the structures in tasks, manipulation of task complexity can result in an attainable and meaningful performance for the students. In other words, employing suitable tasks and also appropriate manipulation of their cognitive demands can match the amount of their complexity with the learners' attentional and mental resources.

In Cognition Hypothesis model presented by Robinson (2001b), it is believed that instructional tasks should be made and sequenced based on increase in their cognitive complexity. Robinson (2001a) proposed three special factors that can be influential in identifying how demanding a task is which includes intrinsic complexity, task conditions, and also the way learners understand task complexity. These three dimensions refer to the design characteristics belonging to tasks that can be used to reduce or increase the cognitive demands tasks make on the learners while they are doing the task. In fact, the Triadic Componential Framework that was first introduced by Robinson (2001b) is made of three components as a whole based on which increasing or decreasing the level of task complexity must be considered as a major factor in sequencing task-based syllabuses because higher levels of complexity in tasks may lead to better accuracy in producing grammatical sentences and also more syntactic complexity. According to the Triadic Componential Framework, the capacity of both the attentional and memory resources is unlimited, and this is quite compatible with increasing complexity of tasks that may alter the access direction to such resources leading to various impacts on the final language production. Robinson introduced two different aspects to access these resources including resource-dispersing and resource-directing changes of complexity levels in tasks. In reality, there is a great theoretical difference between resource dispersing (like the absence or presence of planning time for the learners doing the tasks) and resource-directing (like how many elements are involved in a task) dimensions of complexity (Robinson, 2003).

In fact, both memory and attentional resources in the resource-directing dimension are directed towards larger amounts of functional demands on the person using language, that is such resources are likely to be manipulated along three major factors, including: 1. +/- here and now (for instance, the situations in which the learners are asked to explain a group of events using the present tense while they can look at the pictures depicting them are + here and now, but the conditions in which the learners must perform narratives from their memory using past tense ,while there is no picture illustrating those events are considered – here and now). 2. +/- reasoning demands (for instance, the tasks in which the students are required to arrange some photos illustrating a series of events chronologically, if the learners are asked to present reasons and explanations about why those events have occurred one after the other through using logical subordinators such as *therefore*, *so*, *because*, etc. the tasks are regarded as + reasoning demands, while the tasks in which no reasoning is required are – reasoning demands), and 3. +/- few elements (for instance, if in a writing task the learners are asked to explain about tourist attractions of a special region to a person from a different country who is only interested in visiting special types of places, the task will be with – few elements, while if there is not such a limitation the task will be regarded as + few elements). Based on what Robinson has anticipated, the manipulation of resource-directing dimension can influence the level of complex and accurate language productions.

On the other hand, if fluency in completing the task is the focus of attention, dispersing the attentional resources from the students' linguistic knowledge through manipulating cognitive demands related to the task can be positively effective and by doing this, the task will be more real-life in nature which is relevant to resource-dispersing aspect of task complexity. There are a number of factors that can be manipulated in connection with resource-dispersing dimension including: 1. +/- planning time (the time available to the students to think about the way of doing a task), 2. +/- single task (whether there is just one task to be done at a time or more than one), 3.

+/- prior knowledge (whether or not there is access to previous information related to the task before doing it). Therefore, altering task complexity through the factors mentioned is expected to influence the students' minds leading to affecting the final language production (Robinson, 2001a, 2001b).

Empirical background

In plenty of investigations, the manipulation of task complexity has been explored (Ellis & Yuan, 2004; Ong & Zhang, 2010, 2013). Ruiz-Funes (2015) conducted a study regarding the influence of changing cognitive demands of tasks on the enhancement of writing skill, and the results revealed that it had a greater effect on writing skill in comparison with the effect of learners' proficiency in language. Moreover, another investigation by Ishikawa (2006), altering the complexity level of tasks through +/- here-and-now, which is related to resource-directing dimension, indicated that those participants who were involved in doing the complex type of the task outperformed in fluent writing compared to the participants who did the simple kind of the tasks. Furthermore, it revealed the positive effect of higher levels of complexity in tasks regardless of how proficient the learners were. The findings of this investigation are in line with the results of the study by Hosseini and Rahimpour (2010) confirming that the participants who were involved in doing there-and-then version of the tasks as the more complex task type outperformed the other participants doing here-and-now version in terms of fluency in written language production.

The comparison of resource-dispersing and resource-directing aspects of task complexity is found in a number of studies. For example, Daneshkhah and Alibabaee (2017) explored these two dimensions and contrasted their effects on producing accurate and lexically complex sentences in some writing tasks. The findings showed that manipulating the complexity of tasks through resource-dispersing dimension could lead to better results in relation with accuracy in writing, while the manipulation of task complexity through resource-directing dimension affected the participants' performance

and resulted in a higher level of lexical complexity in their written productions. Such findings are in line with the results of an investigation done by Fakhraee Faruji and Ghaemi (2017) who claimed that arranging the sequence of tasks from easy to difficult can positively influence the learners' accuracy in written productions. In addition, Yahyazadeh Jelodar and Farvardin (2019) conducted a study about the impact of resource-dispersing and resource-directing aspects of task complexity on producing language and the findings indicated that manipulating task complexity in connection with resource-dispersing aspect can play a positive role in fluent writing, whereas the manipulation of task complexity in terms of resource-directing aspect can lead to more accurate written productions.

Since transitional devices are widely used in English writing, a number of investigations in the field of grammar have focused on them (e.g., Dabaghi et al., 2015; Dirmayani & Syatriana, 2019; Lili, 2021). Some researchers (Aidinlou & Reshadi, 2014; Hinkel, 2001; Mohamed-Sayidina, 2010) have considered the factors affecting the correct use of transitional devices among EFL learners. On the other hand, the focus of some other investigations has been on the reasons for learners' problems with using transitional devices (Almaden, 2006; Astanti, et al., 2016; Elahi & Badeleh, 2013). The solutions to the learners' problems in using transitional devices have also been analyzed in some other studies (e.g., Astanti et al., 2016; Mahendra & Dewi, 2017). Regarding task-based language teaching, task sequencing (e.g., (Amini et al., 2021; Madarsara & Rahimy, 2015) and task complexity (e.g., Attarzade & Farahani, 2014; Zare-ee, 2012) have been investigated in the Iranian context; however, the present study focuses on the influence of task complexity manipulation on Iranian EFL learners' learning of transitional devices.

PURPOSE OF THE STUDY

The relevant literature indicates that by means of output learners will be able to produce language with better quality, and this emphasizes the importance of tasks in the written form and the great role they play in enhancing

learners' EFL proficiency. Drawing on writing tasks, the present study investigates the short-term and long-term impacts of various task complexity conditions on EFL learners' learning of transitional devices. Therefore, the following research questions are explored:

1. Do different task complexity conditions (including ± few elements / ± planning time) have differential short-term effects on EFL learners' learning of transitional devices?
2. Do different task complexity conditions (including ± few elements / ± planning time) have differential long-term effects on EFL learners' learning of transitional devices?

METHOD

Participants

Through convenient sampling, five classes (including 114 Iranian EFL learners) from three language institutes located in a city in Iran were selected. In each class, the learners who were at the intermediate level of EFL proficiency as indicated by their OPT scores (i.e. scores between 120 and 149) were randomly selected. Moreover, when required, more intermediate EFL learners form outside the institutes were asked to join the study. Following this procedure, the researcher came up with 15 EFL learners in each class. The results of one-way between groups ANOVA, $F(4) = .538$, $P > .05$, revealed that the five groups were homogeneous in terms of EFL proficiency as indicated by their OPT Scores. The 75 participants (33 males and 42 females) had an age range of 18 to 24, with an average of 21.32. The participants attended extra classes, which were held for the purpose of the study.

Instrumentation

Oxford Placement Test

Oxford Placement Test (OPT) was the first instrument used in the current investigation, which was applied to determine the participants' EFL

proficiency and to select the homogenous learners at the outset of the study. The OPT consisted of two parts: listening and grammar sections. The test had 200 items for which the highest score was 200. Based on the standard of the test, the allotted time was 100 minutes. This test was selected because it was inexpensive, easy to administer, and easy to score objectively. The grammar section of the OPT aimed at testing the grammatical knowledge of the participants by giving 100 questions in multiple-choice form. Every item in this section presented 3 alternatives to the participants among which they were supposed to choose one. The listening section of the test also consisted of 100 items in multiple-choice form. In each item of this part the participants were faced with 2 alternatives and they were expected to select the one which was correct based on the audio program that was played during the test. As a proof of validity, it is worth referring to the study done by Birjandi and Siyyari (2010) in which a significant relationship between the participants' scores in a paper-based TOEFL and their performance in OPT was reported.

Transitional Devices test

In addition to OPT, a researcher-made test of transitional devices was utilized as the pretest, immediate posttest, and delayed posttest. In this test, which Ur (2012) refers to as gapfills, the learners were required to fill in single gap in a sentence with the right transitional device. As the pretest, it was used to ensure that the participants were homogeneous in terms of their knowledge of English transitional devices before the treatment. It was also used as the immediate posttest and delayed posttest to measure the short-term effect and long-term effect of the treatment on the learners respectively. As the time interval between the three administrations of the transitional devices test was at least 3 weeks, the practice effect is expected to have been minimized. As Farhadi et al. (1994) state scholars suggest a time interval of two weeks between the two administrations of the same test to avoid practice effect. This test contained 30 multiple-choice items whose sentences were extracted from three English dictionaries: Oxford Advanced

Learner's Dictionary, Longman Dictionary of Contemporary English and Cambridge Advanced Learner's Dictionary. The items of the test were reviewed by two experts of the field to ensure the content validity. This test aimed to measure the learners' achievement of the instructed transitional devices. In order to successfully elicit the use of the given transitional devices from the participants, the researchers decided to administer this kind of sentence completion items rather than an essay writing task which cannot guarantee the elicitation of all the transitional devices in question. Concerning the reliability of the test, Cronbach's alpha formula rendered an index of .90, which suggests very good internal consistency reliability (Pallant, 2020).

Data Collection Procedure

As stated above, following the sampling procedure, the researcher came up with five classes, each consisting of 15 EFL learners. The learners were offered extra classes which were held for the purpose of the present study. Prior to instruction, a pretest of transitional devices was administered to all groups. Then, the experimental groups received the treatment through different combinations of resource-dispersing and resource-directing factors as follows:

Experimental Group 1(+planning time with +few elements) = (+P+F G)
Experimental Group 2 (-planning time with -few elements) = (-P-F G)
Experimental Group 3 (- planning time with +few elements) = (-P+F G)
Experimental Group 4 (+planning time with -few elements) = (+P-F G)

Based on the above conditions, the participants in the first group received the least complex version of the task and the participants in the second group received the most complex type of it. Groups 3 and 4 were taught via a task with a moderate level of complexity each through a different condition.

The treatment lasted for nine forty-five-minute sessions for each of the experimental groups with explicit instruction of transitional devices followed by a writing task in each session. The explicit instruction in every

treatment session included introducing a number of transitional devices and presenting the Persian equivalent of every item followed by explaining the grammatical points regarding each one. At the end of each session, writing tasks with different amounts of complexity were presented to the participants to explore the impact of task complexity on the learners' learning of transitional devices, as measured through the immediate posttest and delayed posttest. Each task included writing a paragraph about a topic that the participants completed using the transitional devices introduced to them in that session. The participants were required to use all the transitional devices which were taught to them in that session for doing the writing task.

The participants in the control group received regular topic discussion classes for nine sessions with no planned focus on the instruction of transitional devices. As Mackey and Gass (2005) state, using a control group not subjected to the treatment, the researcher can test whether the changes occurred because of the experimental treatment or because of maturation.

The first researcher of the study acted as the teacher in all 5 groups during the instructional sessions. After nine sessions of instruction, an immediate posttest was given to the participants. Then after three weeks a delayed posttest was administered. The same test of transitional devices used as the pretest was also used as the immediate posttest and delayed posttest. As stated above, to avoid practice effect, the researchers administered the three tests with a time interval of three weeks.

Data Analysis

The researchers conducted the data analysis using the Statistical Package for Social Sciences (SPSS 22). Both descriptive and inferential statistics were employed to analyze the data.

As the first measure of data analysis, the homogeneity of the five groups in relation with EFL proficiency was explored. Next, the normality of data distribution was examined. Finally, all the five groups

were compared with each other in terms of their performance in the immediate posttest and the delayed posttest (i.e., between-groups comparisons). For conducting between-groups comparisons, one-way ANOVA with blocking technique (Tabachnick & Fidell, 2007), as an alternative to ANCOVA, was used for analyzing the scores of the immediate posttest due to the violation of the homogeneity of regression slopes assumption of ANCOVA. Moreover, ANCOVA was conducted on the scores of the delayed posttest.

RESULTS

As stated above, in order to conduct the investigation, the researchers divided the participants into four experimental groups and a control group as follows:

Experimental Group 1(+planning time with +few elements = +P+F)
Experimental Group 2 (-planning time with -few elements = -P-F G)
Experimental Group 3 (- planning time with +few elements = -P+F G)
Experimental Group 4 (+planning time with -few elements = +P-F G)
Control Group (No planned exposure to transitional devices)

The results of the analysis performed on the data obtained from the five groups are presented below.

Results of normality of data distribution

Concerning normal distribution of data, Kolmogorov-Smirnov values were found to be non-significant (i.e., $p > .05$) for all sets of scores, indicating normal distribution of the data for all the groups in the OPT, pretest, immediate posttest and delayed posttest.

Results of Research Question 1

RQ1. Do different task complexity conditions (including ± few elements / ± planning time) have differential short-term effects on EFL learners' learning of transitional devices?

In order to explore the first research question, the researcher intended to apply ANCOVA using the pretest scores as the covariate. Therefore, the assumptions underlying ANCOVA were checked first. Although the normality assumption of data distribution and linearity (Figure 1) were met, the homogeneity of regression slopes assumption was violated (Table 1). The significant interaction effect between pretest and group indicates the violation of this assumption.

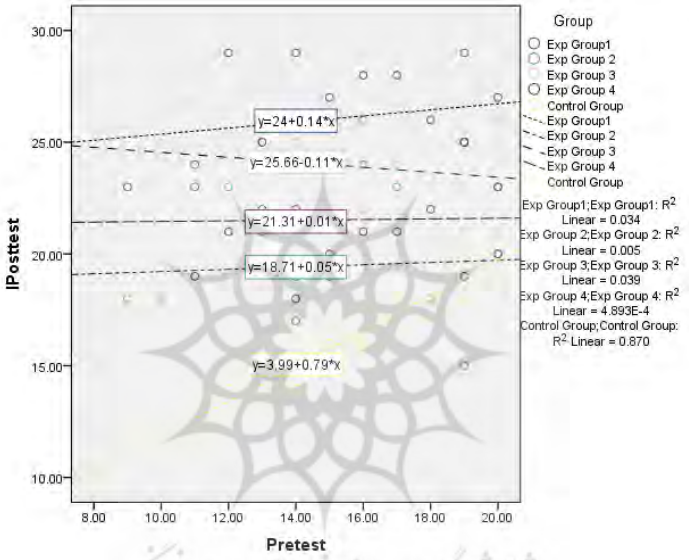

Figure 1: Linearity assumption straight lines for immediate post-test

Table 1: Significant interaction effect showing the violation of homogeneity of regression slopes assumption

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Group	161.262	4	40.315	9.173	.000
Pretest	22.168	1	22.168	5.044	.028
Group * Pretest	**64.464**	**4**	**16.116**	**3.667**	**.009**
Error	285.661	65	4.395		

Therefore, ANCOVA could not be used to explore the first research question. As an alternative to ANCOVA, ANOVA with blocking technique (Tabachnick & Fidell, 2007) was used to control for the probable influence of the pretest on the immediate post-test scores in analyzing the differences among the groups in the immediate post-test. The pretest was treated as a categorical variable consisting of three levels (low, mid, high). The assumption of equality of error variances was also met based on the results of Levene's tests ($p > .05$) for the immediate post-test. Descriptive statistics are available in Table 2.

Table 2: Descriptive statistics related to ANOVA with blocking

Group	Mean	Std. Deviation	N
Group1	26.1333	2.32584	15
Group 2	19.4667	2.53170	15
Group 3	24.0000	1.85164	15
Group 4	21.5333	2.16685	15
Control Group	15.9333	2.49189	15
Total	21.4133	4.20454	75

The results of ANOVA with blocking reported a significant effect for the independent variable "Group". The results are reported in Table 3.

Table 3: ANOVA with blocking for immediate post-test

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Group	911.787	4	227.947	49.536	.000	.768
Pre-test Levels	11.800	2	5.900	1.282	.285	.041
Error	276.100	60	4.602			

The results of ANOVA with blocking indicated that different task complexity conditions (including ± few elements / ± planning time) have differential short-term effects on EFL learners' learning of transitional devices.

In order to locate the differences among the groups in the immediate post-test, the researcher conducted pairwise comparisons using Tukey test. The pairwise comparisons are reported in Table 4.

Table 4: Pairwise comparisons for experimental groups and control group in the immediate post-test

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Immediate Post-test	Group1	Group 2	6.66667*	.83510	**.000**	4.3283	9.0051
		Group 3	2.13333	.83510	.090	-.2051	4.4717
		Group 4	4.60000*	.83510	**.000**	2.2616	6.9384
		Control Group	10.20000*	.83510	**.000**	7.8616	12.5384
	Group 2	Group 3	-4.53333*	.83510	**.000**	-6.8717	-2.1949
		Group 4	-2.06667	.83510	.108	-4.4051	.2717
		Control Group	3.53333*	.83510	**.001**	1.1949	5.8717
	Group 3	Group 4	2.46667*	.83510	**.034**	.1283	4.8051
		Control Group	8.06667*	.83510	**.000**	5.7283	10.4051
	Group 4	Control Group	5.60000*	.83510	**.000**	3.2616	7.9384

*. The mean difference is significant at the 0.05 level.

The contents of Table 4 indicate that group 1 (mean = 26.13) has a significantly better performance than group 2 (mean = 19.46), group 4 (mean = 21.53) and the control group (mean = 15.93), indicating that +P+F was the most effective instructional condition for teaching transitional devices. Table 4 indicates that there is no statistically significant difference

between group 1 (mean = 26.13) and group 3 (mean = 24.00). It is also shown that group 3 (mean = 24.00) outperformed group 2 (mean = 19.46), meaning that -P+F was more effective than -P-F in enhancing the learners' knowledge of transitional devices. In addition, it is indicated that group 2 (mean = 19.46) has a significantly better performance than the control group (mean = 15.93), It is also concluded that group 3 (mean = 24.00) outperformed group 4 (mean = 21.53) and the control group (mean = 15.93), which indicates that -P+F was more effective than +P-F. Furthermore, the comparison between group 4 (mean = 21.53) and the control group (mean = 15.93) reveals a significantly better performance by group 4. The fact that all the experimental groups outperformed the control group reveals that improvement in the learners' knowledge of transitional devices was the result of the treatment sessions rather than maturation.

Results of Research Question 2

RQ2. Do different task complexity conditions (including ± few elements / ± planning time) have differential long-term effects on EFL learners' learning of transitional devices?

Regarding the second research question, one-way ANCOVA was run to explore the differences amongst the groups in the delayed post-test. The normality assumption of data distribution (Table 1), assumptions of linearity (Figure 2) and assumption of homogeneity of regression slopes (Table 5) were met. Concerning the homogeneity of regression slopes assumption, the non-significant interaction effect between pretest and group in Table 5 indicates the retention of this assumption.

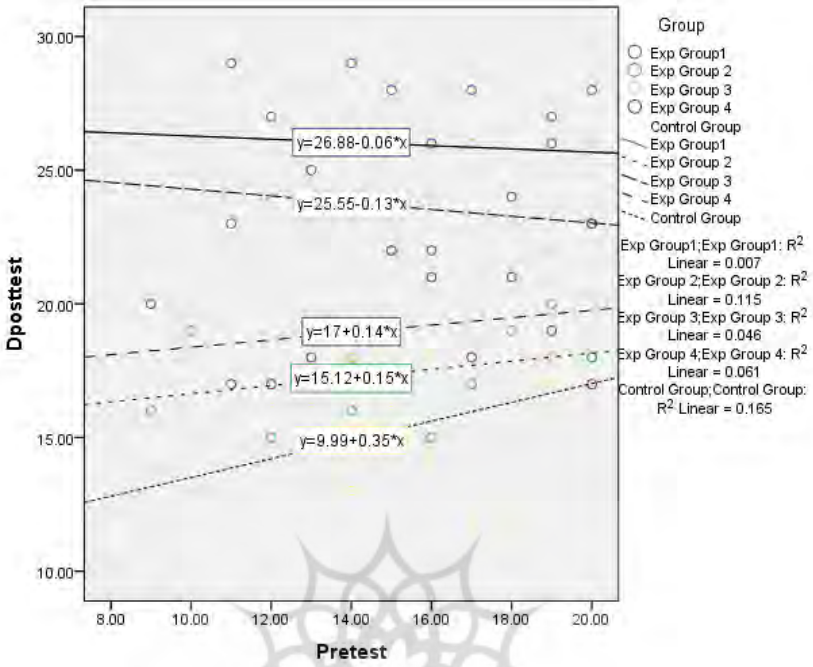

Figure 2: Linearity assumption straight lines for delayed post-test

Table 5: Non-significant interaction effect showing the retention of homogeneity of regression slopes assumption

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Group	115.866	4	28.966	6.817	.000
Pretest	5.967	1	5.967	1.404	.240
Group * Pretest	19.588	4	4.897	1.153	.340
Error	276.183	65	4.249		

Furthermore, as indicated by the results of Levene's test for the delayed post-test, the equality of error variances assumption was also met. As the required assumptions were all met, one-way ANCOVA was run to explore the second research question. The descriptive statistics are reported in Table 6.

Table 6: Descriptive statistics for delayed post-test

Group	Mean	Std. Deviation	N
Exp Group1	25.9333	2.31352	15
Exp Group 2	17.4000	1.50238	15
Exp Group 3	23.6667	1.95180	15
Exp Group 4	19.1333	1.88478	15
Control Group	15.3333	2.55417	15
Total	20.2933	4.44721	75

Note: Exp = Experimental

The results of One-way ANCOVA, treating the pretest scores as the covariate, reported a significant impact for the independent variable "Group". The results are reported in Table 7.

Table 7: Results of one-way ANCOVA for delayed post-test

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Pretest	5.162	1	5.162	1.204	.276	.017
Group	1156.421	4	289.105	67.445	.000	.796
Error	295.772	69	4.287			

ANCOVA results indicated that different task complexity conditions (including ± few elements / ± planning time) have differential long-term effects on EFL learners' learning of transitional devices.

In order to locate the differences among the five groups in the delayed post-test, the researcher conducted pairwise comparisons using Tukey test. The pairwise comparisons are reported in Table 8.

Table 8: Pairwise Comparisons for Experimental Groups and control Group in the Delayed Post-test

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
Group1	Group 2	8.477*	.758	**.000**	6.280	10.675
	Group 3	2.205*	.758	**.049**	.006	4.404
	Group 4	6.783*	.756	**.000**	4.590	8.976
	Control Group	10.561*	.757	**.000**	8.366	12.756
Group 2	Group 3	-6.272*	.756	**.000**	-8.465	-4.080
	Group 4	-1.694	.757	.284	-3.889	.501
	Control Group	2.083	.756	.075	-.109	4.276
Group 3	Group 4	4.578*	.757	**.000**	2.382	6.774
	Control Group	8.356*	.756	**.000**	6.162	10.549
Group 4	Control Group	3.778*	.756	**.000**	1.584	5.971

The mean difference is significant at the .05 level.

As demonstrated in Table 8, group 1 (mean = 25.93) has a significantly better performance than group 2 (mean = 17.40), group 3 (mean = 23.66), group 4 (mean = 19.13) and the control group (mean = 15.33), meaning that +P+F was the best condition for learning transitional devices.

It is also shown that group 3 (mean = 23.66) outperformed group 2 (mean = 17.40), indicating that -P+F was more effective than -P-F in promoting the learners' knowledge of transitional devices. However, there is no statistically significant difference between group 2 (mean = 17.40) and group 4 (mean = 19.13). Moreover, no statistically significant difference was found between group 2 (mean = 17.40) and the control group (mean = 15.33), which means that -P-F was not significantly effective in enhancing the learners long-term learning of transitional devices. In addition, it is concluded that group 3 (mean = 23.66) outperformed group 4 (mean = 19.13) and the control group (mean = 15.33). Furthermore, the comparison of group 4 (mean = 19.13) and the control group (mean = 15.33) reveals a significantly better performance by

the former. Therefore, all the experimental conditions, except -P-F, were effective in promoting the learners' long-term learning of transitional devices as they were all superior to the control group's condition.

DISCUSSION

The aim of the present investigation was to find out whether any significant differences exist among the impacts of various complexity types, including ± planning time and ± few elements, on learning transitional devices among EFL learners in an Iranian context compared with a control group whose participants were not exposed to any of the above-mentioned conditions.

The findings of the study showed that learning transitional devices through various mixtures of ± planning time and ± few elements can result in different levels of learning as far as learning transitional devices is concerned. Regarding short-term effects of task complexity manipulation, +P+F was the most effective instructional condition for teaching transitional devices. Furthermore, -P+F was more effective than -P-F in enhancing the learners' knowledge of transitional devices.

However, +P+F and -P+F were found to be equally effective in promoting the learners' short-term learning. In the same line, -P-F and +P-F were of similar efficacy in enhancing the learners' learning. Finally, it was revealed that improvement in the learners knowledge of transitional devices was the result of the treatment sessions rather than maturation as all the all the experimental groups outperformed the control group.

Concerning long-term effects of task complexity manipulation, +P+F was the best condition for learning transitional devices. Furthermore, -P+F was more effective than -P-F in promoting the learners' knowledge of transitional devices. However, -P-F was not significantly effective in enhancing the learners' long-term learning of transitional devices, as this instruction condition did not yield better results than the control group. Therefore, all the experimental conditions, except -P-F, were effective in

enhancing the learners' long-term learning of transitional devices as they were all superior to the control group's condition.

Fazilatfar et al. (2020), who found that the writers no planning time attained better written accuracy. In the same line, Mehrang and Rahimpour (2010), found that planning time had no effect on the accuracy of the learners' performances. The findings of these two studies are somewhat in line with our findings in that they revealed that no planning can enhance learners' learning. Rahimi and Zhang (2019) found that increasing task complexity result decreases in learners' L2 writing accuracy. This is compatible with our finding that the least complex tasks (+P+F) led to the highest level of learning of transitional devices.

However, our study somewhat contradicts the findings of Rostamian et al. (2018) who found that pre-task planning significantly reduced the amount of self-repair. Furthermore, Lee (2019), found that the most complex tasks elicited the greatest lexical diversity. This somewhat goes against our finding that higher levels of complexity resulted in lower levels of learning of transitional devices. Our findings suggest that higher task complexity leads to lower learning. This stands in contrast with the finding of Robinson (2007) that suggests that task complexity does not affect accuracy.

The results can be interpreted through Robinson's Componential Framework according to which it is claimed that performing two or more tasks simultaneously may distract the students' attention leading to worse performance. The findings are also consistent with Limited Attentional Capacity Model introduced by Skehan and Foster (2001) based on which the exposition of the students' memory to large amounts of cognitive demands at the time of producing language will make the learners prioritize completing the task or concentrate on linguistic dimensions. Actually, paying more attention to the task leads to higher fluency, while focusing on linguistic dimension favors producing more complicated and accurate utterance.

Among the other studies supporting the findings of the current investigation, Tavakoli and Foster (2008) and Tavakoli and Skehan (2005) are outstanding due to claiming that less complex tasks can relieve the processing load and this can free up the amount of space belonging to attention in order to concentrate more on producing language accurately. Furthermore, in another study conducted by Skehan (1996) it was reported that in case the learners are required to produce written language using more complex clauses, the amount of accurate language they can produce decreases and it is almost matching with the observed findings of the present study.

Moreover, Robinson (1995) who conducted an investigation in the field of task complexity remarked that more complex types of tasks will make language learners think about the way they can code processing language as well as the way they can create appropriate expressions. Therefore, this is why the participants of the current study who performed the more complex tasks had lower scores. In other words, this finding can be interpreted to be related to the fact that it is demanding for the students to code language production and in a negative way it can affect their performance. In addition, Skehan (1998b) argued that attentional capacity in human mind has limitation thus; higher levels of complexity in a task can lead to a type of trade-off between the linguistic form and the meaning behind it.

On the other hand, the results observed in the current investigation were largely against the Cognition Hypothesis introduced by Robinson (2007) based on which, in situations that a task is demanding both functionally and cognitively, it seems more probable that the students produce a more accurate and complicated type of language. The opposition between what was discovered in present paper and the Cognition Hypothesis is that in the current research, group two as the recipient of the most complicated kind of task was significantly outperformed by experimental groups one, two and three in both transitional devices tests including the immediate posttest and delayed posttest.

CONCLUSION AND IMPLICATIONS

The findings of this research can be significant since it has concentrated on teaching English via writing tasks of various complexity levels to enhance writing skill. Actually, a group of researchers believe in teaching language through courses with task-based syllabuses as perfect substitutes for linguistic-based courses (Ellis, 2003; Long, 2015; Robinson, 2001; Skehan, 1996). Grading and sequencing tasks in educational contexts is of great significance and has led to the appearance of a concept called task complexity.

Based on the findings of the present research and the relevant literature, the following conclusions were extracted. Primarily, the learners' grammar in general and their knowledge of transitional devices in particular can be enhanced through task-based instruction, and such an enhancement has roots in the fact that this type of instruction requires the students to have an active role in the process of learning. In fact, these are the students themselves who are responsible to develop their language proficiency and the instructors can help them in this process and just provide them with the necessary feedback. Secondly, the roles teachers play in task-based instruction may vary when taking advantage of the tasks. According to Richards and Rodgers (2014) and Nunan (1989), selecting and sequencing the tasks, making learners prepared to do the tasks, explaining the form, teaching helpful strategies and providing the learners with guidance are regarded as the activities that teachers can do to help their students in task-based instruction. Thirdly, the findings of the current investigation indicated that language learners can learn transitional devices through doing tasks at various complexity levels; however, the amount of their learning differs based on how complex the tasks have been in relation with the existence of planning time and number of elements included in the tasks. Actually, the participants' scores in the immediate and delayed posttests support this impression.

Both EFL learners and teachers can take advantage of the useful impressions related to using tasks with various amounts of complexity in language classes. One major item to be noticed is the fact that tasks at different complexity levels can provide EFL learners with large amounts of motivation. The current research also presents the data based on which it is concluded that the L2 learners' knowledge of transitional devices can be largely affected by how demanding the educational writing tasks are. Moreover, in relation with the trade-off hypothesis, the findings of the current investigation show that the attentional resources belonging to L2 learners are limited and due to this, they cannot devote the same amount of attention and time to the procedures and aspects of producing L2, and that such limitations are required to be considered when examining the impacts of complexity in tasks on the process of learning a new language.

Although the current research presents some information about the impacts of task complexity on learning transitional devices, it includes some limitations too. The potential history effect can be considered as one of the limitations of the present study, which was out of the researchers' control. Another special aspect that requires attention is that the generalization of the results discovered in this investigation may not be applicable in all contexts since the small sample of this study should not be considered to be representative of all students of English. The next important point related to this study is that the treatment just lasted for nine sessions during three weeks and as Storch (2009) remarks, considerable amount of enhancement in a language skill cannot take place during such a limited time; therefore, longitudinal studies are required to recognize how much language improvement in terms of learning transitional devices has taken place. As a result, the effects of task complexity on grammar learning in the Iranian context is in the initial steps and further investigations in this field can provide us with more valuable information in the future.

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