

## The Simultaneous Effects of Task Complexity and Task Types on EFL Learners' Written Performance

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**Abstract:** The impetus of the present study was to scrutinize the simultaneous effects of task complexity and task types on 60 EFL learners' written task performance regarding accuracy, complexity, and fluency. Complexity was operationalized at two levels: simple and complex, and two types of psycholinguistic tasks (decision-making and information-gap) were used in this study. Participants of this study were just one group with the same level of proficiency who were randomly chosen at Avatak Institute in Urmia, Iran. All 60 participants were required to conduct simple decision-making and simple information-gap tasks in one session and after two weeks they were required to do complex decision-making and complex information-gap tasks. The participants' performances were then analyzed utilizing paired samples t-test. The results of statistical analysis showed that in decision-making tasks, task complexity had significant effect on accuracy and fluency of learners, but it did not have significant effect on syntactic complexity. In case of information-gap tasks, data analysis revealed that there was statistically significant effect of task complexity on three areas of linguistic performance. Also, the results revealed that there is a significant difference between two tasks in terms of fluency, but the difference was not so outstanding in terms of accuracy and syntactic complexity.

**Key words:** Task, Task complexity, Task type, Accuracy, Fluency, Complexity, Writing performance

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### INTRODUCTION

It is widely acknowledged that tasks have to be taken into consideration both in theoretical accounts of SLA and in practical pedagogic situations. There are large numbers of publications related to task-based language learning, teaching, and testing (Long & Crookes, 1992; Bygate, Skehan, & Swain, 2001; Ellis, 2003; Skehan, 2003). It is hypothesized that task features have some positive or negative impact on learners' performance in terms of accuracy, fluency, and complexity. Therefore, because of the importance of tasks and their aspects, this study attempted to investigate the effects of two aspects of task; that is, task complexity and task types on Iranian EFL intermediate learners' written performance through presenting an overview of research into task complexity and task types and to connect the findings to task sequencing decisions, syllabus design, language production and acquisition and to show how these variables impact on the fluency, accuracy, and complexity of L2 written performance.

#### 2. Literature Review:

##### 2.1 The Concept Of Task Complexity As A Criterion For Grading Tasks:

As Gilabert (2004) asserts, the need for sequencing tasks from simple to complex in a reasoned way that will foster interlanguage development was the impetus to the emergence of the concept of task complexity. As cited by Salimi, Dadashpour, and Asadollahfam (2010), task difficulty provides the teacher or syllabus designer with information about the level of challenge that a task is likely to contain, a level which the teacher will then have to match with his or her knowledge of the students who will do the task. There are different but similar definitions of task complexity. Ellis (2003, p.351) defines task complexity as "the extent to which a particular task is inherently easy or difficult." According to Robinson (2001a, p.29), task complexity is defined as "the result of intentional, memory, reasoning, and other information processing demands imposed by the structure of the task on language learner." Skehan (1998) uses the term interconnectedness to refer to complexity: more elements or characters make for greater task difficulty.

##### 2.2 Models of Task Complexity:

With respect to the influence of task complexity on linguistic performance different assumptions have been formulated. Among these the two theoretical frameworks are the most important which have motivated a great number of studies to examine the effects of manipulating the different dimensions of task complexity: Robinson's Cognition Hypothesis (2001a, 2001b, 2003, 2005, 2007), and Skehan & Foster's Limited Attentional Capacity Model (Skehan, 1998, 2001, 2003; Skehan & Foster, 1999, 2001).

### **2.2.1 Skehan and Foster's Limited Attentional Capacity Model:**

Kuiken and Vedder (2007) cited Skehan and Foster's model and asserted that their model indicates that if a task requires significant attention to be given to its content and a high level of cognitive processing, there will be less attention available to be given to the linguistic output. So, tasks which are cognitively demanding are likely to draw attentional resources away from language forms. According to Skehan (1998, 2001, 2003), the Limited Capacity means that the learner's mind must divide its attention between the message being conveyed and the formal aspects of language needed for the message to be successfully formulated. Skehan and Foster (1999, 2001) believe that the idea of limitedness of capacity has trade-off effects among the three aspects of language production: accuracy, fluency, and complexity; that is, when task complexity increases, learners instead of focusing on complexity and language production will focus on the content of the task.

### **2.2.2 Robinson's Triadic Framework of Task Complexity:**

Robinson's Cognition Hypothesis (2001a, 2001b, 2003, 2005, 2007) assumes that as tasks increase in the conceptual/ communicative demands placed on learners, learner attention to aspects of the L2 system that attempt to meet those demands may also be increased. Therefore when complexity of tasks along resource-directing variables increases, learners' attention will be on some specific concepts and therefore accuracy, linguistic complexity, and structural complexity improves, also it leads to higher interaction, but fluency decreases. In resource-dispersing variables, because learners' attention is not on specific concepts and it disperses over many other areas, so fluency, accuracy, lexical complexity, and structural complexity decrease, just interaction increases.

Kuiken and Vedder (2007) examined the effects of task complexity on written performance. The participants were university students of Italian and French with different levels of L2 proficiency. All participants had to perform two writing tasks in which cognitive complexity was manipulated. Results showed that students make fewer mistakes in complex task than in non-complex one. But no significant differences in syntactic complexity and lexical variation were found in the output from the complex to non-complex tasks. In some studies conducted by Kuiken *et al.* (2005), the effects of increasing cognitive task complexity were examined. The results showed that increasing task complexity had a positive effect on the accuracy of learners' writing but no significant effect on syntactic complexity.

### **2.3 Task types:**

There are many factors such as anxiety of the L2 learners, planning time, familiarity with the topic, genre of the tasks, learner's proficiency level, task type, task structure, task condition, and the degree of cognitive complexity of the tasks which affect the performance of second language learners; for example, their speed of production and complexity of their utterances (Rahimpour 1997, 1999, 2008). As Kuiken and Vedder (2008, p.49) points out "in the literature on both L1 and L2 writing, it has been suggested that some task types result in lower test scores than others. The issue of task types is of main concern of language instructors and syllabus designers. As Rahimpour (2007) claims, the L2 learner's performance differs from task to task. So, L2 learner's production will be different when they perform different task types, and consequently these different types of tasks will result in variation, called "task-induced variation". Tarone (1982, 1983, 1985, 1988, 1990), agrees with this variation and asserts that in performing different tasks, learner's production of some grammatical, morphological and phonological forms will vary in a particular manner. Foster and Skehan (1996), Franken and Haslett (2002), Sweller (1994), claim that task type can be an important factor in determining if writers are able to automatize certain features of writing tasks or deal with additional load to process those aspects. It has been argued that different kinds of tasks are all useful components of a school-wide assessment system. Individual teachers try to develop and use tasks that meet less stringent conditions than the tasks they would develop as an academic department, an instructional team, a subject-like group, or other group to assess student learning towards more commonly help goals. However, tasks developed for classroom use can be revised, so they meet the more stringent requirements of intra and inter school use.

Rezazadeh, Tavakoli, and Eslami-Rasekh (2011), investigated the role of task type in foreign language written production in terms of accuracy, fluency, and complexity. Two types of tasks (instruction task and an argumentative task) used in the study. Participants in the instruction-task group performed significantly better than those in argumentative-task group in terms of accuracy, fluency, and complexity. The argumentative essays were produced with more complex language than the instruction essays. Fluency was higher in instruction essays, and in terms of accuracy, instruction-task group performed better than those in argumentative-task group, but argumentative essays were more accurate than instruction essays.

## **Research**

### **3.1. Research Question and Hypotheses:**

*RQ:* What are the effects of task complexity and task types on intermediate EFL learners' written performance in terms of accuracy, fluency and complexity?

*RHO*: Simultaneous manipulation of task complexity and task types does not affect written performance of intermediate EFL learners in terms of accuracy, fluency and complexity

*RH1*: complex decision-making tasks will lead to more accuracy and complexity, but less fluency than simple decision-making tasks.

*RH2*: complex information-gap tasks will lead to more accuracy and complexity, but less fluency than simple information-gap tasks.

### **3.2. Accuracy measure:**

The number of error-free T-units per T-units i.e., the percentages of T-units that don't contain errors. (Rahimpour, 2008; Errasti, 2003; Larsen-Freeman, 2006 and Salimi, Dadashpour, & Asadollahfam 2011).

### **3.3. Fluency measure:**

The Fluency of the written production of the learners was measured by words per T-units. (Ishikawa, 2006; Kuiken and Vedder, 2007; Salimi, Dadashpour, & Asadollahfam 2011).

### **3.4. Complexity measure:**

Syntactic complexity was measured through proportion of clauses to T-units, which according to Foster and Skahan (1996) is a reliable measure, correlating well with other measures of complexity.

### **3.5. Participants:**

The participants in the study were 60 female Intermediate students taking English classes at Avatalk institute in Urmia, Iran with Turkish L1 background. And they were all non-native with respect to the purpose of the experiment. The age range was between 18-24, and the level of proficiency of them was almost the same. (According to the Placement Test that the learners exposed to by the institute).

### **3.6. Materials and Tasks Used In The Study:**

The current study used a total number of four types of writing tasks. There were two information-gap tasks and two decision-making tasks whose complexity was manipulated following Robinson's task complexity framework (1995, 2001a, 2005). Within resource-directing dimensions, the factor from Robinson's framework that was manipulated was ( $\pm$  reasoning demand). Information-gap tasks were designed as two-way tasks which require both interaction and written texts and expect an outcome. Simple and complex decision-making tasks were adopted from Gilabert (2007). Simple and complex information-gap tasks were chosen from Intro and Interchange 3 books respectively.

### **3.7. Procedure:**

The experiment was conducted in five classes during their regular class periods. In first session in each class all the students were given a simple decision-making task and were required to write a piece of writing according to the fire-chief task that was given to them. They had fifteen minutes to do this task. After finishing this task, information-gap task was employed. Students were paired randomly, each was given a simple different information-gap task and they didn't see each other's pictures. One of them asked some questions from her partner according to her own picture and wrote the answers. Then according to these answers she was supposed to create a piece of writing. Her partner exactly followed this process, and she created a writing too. All the pairs in all classes did this task. The time limit for this task was ten minutes. Finally after two weeks the same process with the same time limits was administered to the same participants. The difference was that instead of using simple tasks, complex decision-making and complex information-gap tasks were given to learners.

### **Data Analysis And Results:**

As pointed out earlier, to identify how the students performed two writing tasks, three aspects of language use were examined. This section shows the differences between learners' written production when they were asked to perform different types of tasks with different levels of complexity.

As table 4.1 shows, significance level of paired t-tests in case of accuracy for decision-making task is less than 0/05 ( $0/006 < 0/05$ ); therefore, complexity of task has significant effect on the accuracy of participants. However, since the significance level of paired t-tests in case of fluency and complexity for decision-making tasks are higher than 0/05 ( $0/6 > 0/05$  and  $0/5 > 0/05$  respectively), increasing task complexity had no significant effect on fluency and also complexity of students' writing.

**Table 4.1:** Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 CDA SDA	.1532	.41792	.05395	.0452	.2611	2.839	59	.006
Pair 2 CDF SDF	.2515	3.73315	.48195	-.7129	1.2159	.522	59	.604
Pair 3 CDC SDC	.0720	.83720	.10808	-.1443	.2883	.666	59	.508

As table 4.2 shows significance level of paired t-tests in case of fluency for information-gap task is higher than 0/05 ( $0/3 > 0/05$ ). Therefore, complexity of task has no effect on the fluency of participants. However, since the significance level of paired t-tests in case of accuracy and complexity for information-gap tasks are less than 0/05 ( $0/0 < 0/05$  and  $0/001 < 0/05$  respectively), increasing task complexity had significant effect on accuracy and also complexity of students` writing. Therefore, the results obtained from table 4.2 reveal that hypothesis 2 is not completely confirmed.

**Table 4.2:** Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 CIA SIA	.2413	.28298	.03653	.1682	.3144	6.606	59	.000
Pair 2 CIF SIF	.3148	2.34148	.30228	-.2900	.9197	1.042	59	.302
Pair 3 CIC SIC	.3018	.65720	.08484	.1321	.4716	3.558	59	.001

The statistical results reveal that none of the hypotheses of this study was completely confirmed. As tables above show, two tasks were compared and investigated separately through pairing them in terms of accuracy, fluency, and complexity. Because of the nature of the research question, in this part two tasks (decision-making and information-gap) are investigated and compared with each other simultaneously. Table 4.3 makes it clear that in pair 2 which investigates the effect of two complex tasks on fluency, there is a significance level. Because  $P < 0/05$  ( $0 < 0/05$ ). So it is clear that there is a big difference between two complex tasks in terms of fluency. However, since the significance level of paired t-tests in case of accuracy and complexity for complex decision-making and complex information-gap tasks are higher than 0/05 ( $0/15 > 0/05$  and  $0/61 > 0/05$  respectively), increasing task complexity had not significant effect on accuracy and also complexity of students` writing.

**Table 4.3:** Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 SDA SIA	.0260	.34784	.04491	-.0639	.1159	.579	59	.565
Pair 2 SDF SIF	2.8337	3.29335	.42517	1.9829	3.6844	6.665	59	.000
Pair 3 SDC SIC	.1792	.81930	.10577	-.0325	.3908	1.694	59	.096

Table 4.4 shows that the significance level is 0 that is less than 0/05 ( $P < 0/05$ ). Therefore, it can be claimed that there is a big difference between two tasks.

**Table 4.4:** Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Decision and Information	.9494	2.34432	.12356	.7064	1.1924	7.684	359	.000

**Discussion and Results:**

The main purpose of the current study was to examine the effects of task complexity and task types on written performance of Iranian EFL intermediate learners. The results of the study revealed that in decision-making tasks, complexity of learners` written performance was not affected significantly by increased task complexity. Data analysis of the study also showed that there was statistically significant effect of task complexity on accuracy and especially fluency of learners` written performance. In other words, we found a beneficial effect of increasing task complexity on accuracy and fluency of written task performance. As Rahimpour (1999) points out, the cognitive demand imposes extra burden of information processing, memory capacity, and attentional resources on learners` mental capacity which pushes the learners to go beyond their current level of language proficiency and stretch their interlanguage system, therefore the high rate of fluency in the written production can be attributed to the fact that increasing cognitive demand of pedagogic task has an important influence on learning.

The results regarding decision-making tasks are in line with Skehan and Foster`s (2001, p.193) proposition that “prioritization or predisposition (or both) seem to orient performance towards one (or two) of the three areas [accuracy, fluency, and complexity] theorized to be important, with result that other(s) suffers.” The results of this study regarding decision-making tasks are in line with results of the study conducted by Michel, Kuiken and Vedder (2007). In terms of accuracy and complexity the findings of this study about decision-making tasks are in line with the findings of Rahimpour (2007). Like this study he found that complex tasks led to more accuracy but less complexity than simple tasks. But in terms of fluency, the results are contrary to this study. Because unlike the current study he found that simple tasks lead to more fluency than complex one.

In case of information-gap tasks, data analysis revealed that there was statistically significant effect of task complexity on three areas of linguistic performance. The results revealed a beneficial effect of increased task complexity on accuracy, complexity, and especially fluency on learners` written performance. Ishikawa (2006) in his study found that increasing task complexity with respect to the  $\pm$ Here and Now dimension increased the accuracy, complexity, and fluency of written language production. Therefore, his findings are in line with the results of this study about information-gap tasks. Gilabert (2008) in his paper “manipulating task complexity” examined the effects of increasing task complexity on three areas of production. Along resource-directing dimensions he used displaced, past time reference ( $\pm$ here and now), number of elements ( $\pm$ elements), and reasoning demands ( $\pm$  reasoning demands), and got these results: positive impact on lexical complexity and accuracy, no effect on fluency. Therefore, in terms of complexity and accuracy the results are in line with this study, but in terms of fluency it is in contrast with the current study.

Considering the effects of task complexity on two types of tasks (decision-making and information-gap), the results demonstrated that there is a significant difference between two tasks in terms of fluency, but the difference is not so outstanding in terms of accuracy and complexity. Rahimpour (2010) investigated the impact of task condition on L2 learner`s oral performance through two types of tasks (open and closed tasks). The results showed a significant difference between the closed and open conditions in terms of fluency, but no significant difference in terms of accuracy. Therefore, in this regard the findings resemble the results of this study that between decision-making and information-gap tasks there was a significant difference in terms of fluency, but no significant difference in terms of accuracy.

**6. Conclusion**

This study applied two types of psycholinguistic tasks (decision-making and information-gap) with two levels of task complexity (simple and complex). As the empirical findings of this study show, EFL learners performed somewhat differently on these two different types of tasks. Therefore, using a variety of writing tasks with different levels of complexity (simple and complex) is recommended to EFL teachers and also syllabus designers. In other words, the results obtained make it clear that integration of task complexity into sequencing studies and also utilizing appropriate task types are two important issues in TBLT.

The findings of the study demonstrate that in decision-making tasks there is statistically significant effect of task complexity on accuracy and especially fluency of EFL learners` written performance. But in terms of

syntactic complexity learners' written performance were better in simple tasks. In other words, task complexity has no significant effect on syntactic complexity.

Considering information-gap tasks the results revealed that task complexity has positive effect on all areas of performance (accuracy, fluency, and complexity). Especially in terms of fluency, increasing task complexity has significant effect on EFL learner's written performance.

Considering simultaneous effects of task complexity and task types, the results indicated that in decision-making tasks (whether simple or complex) students were more fluent than information-gap tasks (whether simple or complex). But in terms of accuracy and complexity there was not significant difference between two tasks. Anyway, this indicates that two tasks are different with each other in terms of accuracy, fluency, and complexity. These differences in terms of the aspects of language production can have empirical implications for teachers to use different types of tasks in classroom environment, especially if they want to focus on one or two aspects of language production. If teacher's purpose is to enhance learners' fluency through increasing complexity, for example, both decision-making and information-gap tasks would be appropriate activity to incorporate in the classroom. If, on the other hand, focusing on complexity is not very essential to improve, teachers can use decision-making tasks instead of using information-gap tasks.

To sum up, in task-based language teaching the language teacher must identify not only the cognitive demands embedded in the tasks, but also the types of tasks that are required of learners to conduct them.

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