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# **Effects of Task Cognitive Complexity and Time Limits on Writing Performance of EFL Learners with Different Proficiency Levels**

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In the name of God

Dedicated  
to  
my beloved parents

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## **Abstract**

This study investigated the effects of manipulating the cognitive complexity of tasks along +/- few elements and the time limits on L2 learners' writing performance. To conduct the study, 60 Iranian EFL learners with two levels of proficiency, low and high intermediate, were selected and assigned to three groups based on the time devoted to task completion. The participants performed both a simple and complex version of information-gap,

opinion-gap, and reasoning-gap tasks. The learners' writing performance was measured in terms of accuracy, syntactic complexity, and fluency. The results indicated that increasing cognitive complexity of the tasks positively influenced the accuracy of the reasoning-gap tasks but not the information-gap and opinion-gap tasks. Regarding syntactic complexity, more complex sentences were measured in the more complex information-gap and reasoning-gap tasks. The increase in the cognitive complexity of the tasks enhanced the fluency measure regarding the information-gap and reasoning-gap tasks. Therefore, the findings partially provided support for Robinson's Cognition Hypothesis. With regard to the time limits, the results did not show the significant influence of the time limits on writing performance in terms of accuracy and syntactic complexity. Furthermore, there was no significant difference between the low and high intermediate learners regarding accuracy and syntactic complexity. The findings of the present study have practical implications for syllabus designers, English language teachers, and testers.

Key words: Cognitive complexity, Task, Time limits, Proficiency, Accuracy, Syntactic complexity, Fluency

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# Chapter One: Introduction

## 1.1. Introduction

During the last two decades, Task-based Language Teaching (TBLT) has been one of the main concerns of research in language pedagogy (Ellis, 2003) and has gone through a multitude of studies (Nunan, 2004). It originates from the idea that exposing learners to authentic language and involving them in meaningful activities are necessary for communication (Ellis, 2003; Prabhu, 1987; Skehan, 1996).

According to Ellis (2003), Robinson (2001) and Skehan (1998) emphasized that the order of tasks used in language instruction should be in a way that they gradually get similar to tasks performed in real situations. Robinson (2001) suggested "Triadic Componential Framework". Based on this framework, Cognition Hypothesis would be a basis for designing tasks and preparing appropriate tests for classrooms. This framework lends itself to sequencing tasks. According to Robinson's (2001) Cognition Hypothesis, task complexity may have impacts on L2 learners' performance. Robinson differentiated between task complexity, task difficulty, and task conditions. Also, he made a clear-cut classification for task complexity. He put them in two groups, i.e. resource-directing and resource-dispersing. Resource-directing includes [+/- few elements], [+/- here-and-now], and [+/- no reasoning demands]. Resource-dispersing consists of [+/- planning], [+/- single task], and [+/- prior knowledge]. Robinson (2001) and Skehan (1998) stated that cognitive complexity is a factor that influences learners' task implementation.

Along with this theoretical framework, some researchers (Foster & Skehan, 1996, 1997, 2001; Iwashita, McNamara, and Elder, 2001; Kuiken & Vedder, 2007; Mehnert, 1998; Ortega, 1999; Rahimpour, 1997; Robinson, 1995, 2001; Wigglesworth, 1997; Yuan & Ellis, 2003) sought to study Robinson's model for sequencing tasks. They investigated the effects of increase in cognitive complexity of tasks on L2 learners' performance in relation to accuracy, complexity, and fluency.

The majority of researches investigated the effects of increase and decrease of cognitive complexity of tasks on L2 speaking production. However, a small number of researchers (Ishikawa, 2006; Kuiken & Vedder, 2007; Ojima, 2006) conducted the studies focusing on L2 writing performance.

According to Robinson (2001), more investigation should be carried out in order to reexamine the effects of manipulating task complexity according to resource-directing dimensions. This study aimed at investigating the effects of manipulation of the cognitive complexity of tasks in relation to [+/- few elements] and time allocated to task completion on L2 learners' performance in relation to accuracy, fluency, and syntactic complexity.

## **1.2. Statement of the Problem and Significance of the Study**

Following the presentation of Cognition Hypothesis Model by Robinson (2001), some researchers conducted some empirical studies to verify this model. Robinson (2005) believes that task sequencing based on cognitive complexity of tasks is more effective because the other two dimensions, i.e. task difficulty and task conditions, cannot provide helpful information for selecting and ordering tasks. As a result, most researchers' attention has centered on task complexity in order to study the effects of manipulating the cognitive complexity of tasks on L2 learners' performance.

According to Gilabert (2005), some studies have been conducted in order to discover if manipulating cognitive complexity of tasks has any effects on L2 learners' performance, such as task familiarity (Foster & Skehan, 2001; Robinson, 2001), number of elements (Kuiken & Vedder, 2007; Robinson, 2001), cited in Gilabert (2005), planning time (Foster & Skehan, 1996; Mehnert, 1998; Ortega, 1999; Skehan & Foster, 1997; Wigglesworth, 1997; Yuan & Ellis, 2003), and here-and-now/there-and-then (Iwashita, McNamara, and Elder, 2001; Rahimpour, 1997; Robinson, 1995). As maintained by Robinson (2001, 2003, 2005), working with tasks to change their complexity in relation to resource-directing helps learners to develop their L2 performance. However, such a promotion in L2 performance cannot be achieved through increasing task complexity in relation to resource-dispersing factors. Therefore, in the current study [+/- few elements] as one of the dimensions

included in resource-directing category will be manipulated to study its effects on L2 learners' performance.

The researches concentrating on the effects of task complexity on L2 speaking tasks exist in large numbers. Rahimpour and Hosseini (2010) cited some studies focusing on L2 learners' oral task performance (Foster & Skehan, 1999; Gilabert, 2007; Ishikawa, 2008; Kim, 2009; Ortega, 1999; Rahimpour, 1997, 1999, 2007; Robinson, 1995, 2001, 2007; Skehan & Foster, 1999; Yuan & Ellis, 2003). However, just few studies (Ishikawa, 2006; Kuiken & Vedder, 2007, 2008) were carried out to examine the effects of task complexity on writing performance (Rahimpour & Hosseini, 2010). The present researcher intends to study the effects of manipulating +/- few elements on L2 learners' writing performance.

As cited in Lynch and Maclean (2000), Johnson (1996) and Skehan (1996) stated that investigations related to time (Ellis, 1987; Foster & Skehan, 1996, 1997) addressed the effects of time given to students in order to plan their performance not time allocated in order to complete the tasks . This study seeks to examine the effects of time devoted to task implementation on learners' performance.

### **1.3. Research Questions**

The current study seeks to answer the following questions:

Question 1: Does the increase in the cognitive complexity of tasks along +/- few elements affect the accuracy of L2 learners' writing performance?

Question 2: Does the increase in the cognitive complexity of tasks along +/- few elements affect the syntactic complexity of L2 learners' writing performance?

Question 3: Does the increase in the cognitive complexity of tasks along +/- few elements affect the fluency of L2 learners' writing performance?

Question 4: Do the time limits affect the accuracy of L2 learners' writing performance?

Question 5: Do the time limits affect the syntactic complexity of L2 learners' writing performance?

Question 6: Do the time limits affect the fluency of L2 learners' writing performance?

Question 7: Do learner's proficiency levels interact with task cognitive complexity?

## **1.4. Research Null Hypotheses**

The following null hypotheses were formulated:

H0<sub>1</sub>: The increase in the cognitive complexity of tasks along +/- few elements has no significant effect on the accuracy of L2 learners' writing performance.

H0<sub>2</sub>: The increase in the cognitive complexity of tasks along +/- few elements has no significant effect on the syntactic complexity of L2 learners' writing performance.

H0<sub>3</sub>: The increase in the cognitive complexity of tasks along +/- few elements has no significant effect on the fluency of L2 learners' writing performance.

H0<sub>4</sub>: The time limits have no significant effect on the accuracy of L2 learners' writing performance.

H0<sub>5</sub>: The time limits have no significant effect on the syntactic complexity of L2 learners' writing performance.

H0<sub>6</sub>: The time limits have no significant effect on the fluency of L2 learners' writing performance.

H0<sub>7</sub>: Learner's proficiency levels do not interact with task cognitive complexity.

## **1.5. Definitions of Key Terms**

### **1.5.1. Theoretical Definitions**

#### **Task**

A number of definitions of tasks (Ellis, 2003; Nunan, 1989; Prahbu, 1987; Skehan, 1998) has been provided by different authors.

According to Prabhu's (1987) definition, "a task is an activity which requires learners to arrive at an outcome from given information through some process of thought, and which allows teachers to control and regulate the process" (Prabhu, 1987, p. 24).

Nunan (1989) defined a task as "a piece of classroom work which involves learners in comprehending, manipulating, producing or interacting in the target language while their attention is principally focused on meaning rather than on form" (Nunan, 1989, p. 10).

Skehan (1998) defined task as follows: "A task is an activity that primarily is meaning-based but is used for elicitation of certain grammatical forms and a goal should be met and evaluation is done based on that outcome" (Skehan, 1998, p. 95).

Ellis (2003) offered a definition of task including all necessary details: "A task is a work plan that requires learners to process language pragmatically in order to achieve an outcome that can be evaluated in terms of whether the correct or appropriate propositional content has been conveyed. To this end, it requires them to give primary attention to meaning and to make use of their own linguistic resources, although the design of the task may predispose them to choose particular forms" (Ellis, 2003, p. 16).

## **Task Complexity**

Skehan (1998) defined task complexity as "consisting of cognitive factors that can be manipulated during task design to obtain the desired elicitation of learner language".

Robinson (2001, p. 28) stated that:

"Task complexity is the result of the attentional, memory, reasoning, and other information processing demands imposed by the structure of the task on the language learner. These differences in information processing demands, resulting from design characteristics, are relatively fixed and invariant." (Robinson, 2001, p. 28)

## **Time Pressure**



Skehan (1998, p. 100) defined time pressure as "the perception of how much pressure there is to complete the task under difficult conditions" or "the time that is available for processing".

Yuan and Ellis (2003) also defined time pressure as the time that learners need to complete the tasks. As a result, time pressure differs through change in the amount of time devoted to learners for task implementation.

### **Accuracy, Fluency, and Complexity**

Brumfit (1984), cited in Chambers (1997), defined fluency as, "The maximally effective operation of the language system so far acquired by the students" (Brumfit, 1984, p. 57). As pointed out in Gilabet (2004) and Yuan and Ellis (2003), Skehan (1996, p. 22) stated that fluency "concerns the learner's capacity to produce language in real time without undue pausing and hesitation" and complexity "concerns the elaboration or ambition of the language that is produced" (Skehan, 1996, p. 22). Accuracy refers to "extent to which the language produced conforms to target language norms" (Yuan & Ellis, 2003, p. 2).

Wolfe-Quintero, Ingaki, and kim (1998) defined fluency "as the rapid production of language", accuracy "as error-free production", and complexity "as the use of varied and sophisticated structures and vocabulary" (Wolfe-Quintero, Ingaki, and kim, 1998, P. 117)

According to Ellis (2003), Skehan (1998) made a distinction between three notions: "1) fluency, the capacity of the learner to mobilize his/her system to communicate meaning in real time; 2) accuracy, the ability of the learner to handle whatever level of interlanguage complexity he/she has currently achieved; and 3) complexity, the utilization of interlanguage structure that are 'cutting edge', elaborate, and structured" (Ellis, 2003, p. 113).

Some measures have been suggested in order to describe linguistic performance. Kuiken and Vedder (2007) stated that Wolfe-Quintero, Inagaki, and kim (1998) used some measures in order to assess linguistic performance in relation to accuracy and syntactic complexity. According to Wolfe-Quintero, Inagaki, and kim (1998) accuracy is measured as "the number of error-free T-units, error-free T-units per T-unit, and the number of errors per T-unit" and syntactic complexity is assessed as

"the number of clauses per T-unit and the number of dependant clauses per total number of clauses" (Kuiken & Vedder, 2007, pp. 266-267).

Robinson (2001) used some measures to assess learners' performance in relation to syntactic complexity, accuracy, and fluency. He described syntactic complexity as "a measure of subordination, clauses per C-unit", accuracy as "the measure of error free C-units", and fluency as "a measure of the number of words per C-unit" (Robinson, 2001, p. 40)

## Writing Skill

As pointed out by Brown (2001), Elbow (1973, pp. 14-16) stated that "The common sense, conventional understanding of writing is as follows. Writing is two-step process. First you figure out your meaning, then you put it into language". He mentioned that "writing is, in fact, a transaction with words whereby you free yourself from what you presently think, feel, and perceive".

Brown (2001) expressed that "writing is a composing process" (p. 347) and "written products are often the result of thinking, drafting, and revising procedures that require specialized skills, skills that not every speaker develops naturally" (p. 335).

## Proficiency

Clark (1972) defined language proficiency as the language learners' ability . . . to use language for real-life purposes without regard to the manner in which that competence was acquired. Thus, in proficiency testing, the frame of reference . . . shifts from the classroom to the actual situation in which the language is used (Clark, 1972, p. 5).

Stern (1983, p. 341) defined proficiency as: "the actual performance of given individual learners or groups of learners" and argued that it involves:

1. The intuitive mastery of the *forms* of language
2. The intuitive mastery of linguistics, cognitive, affective and sociocultural *meanings*, expressed by language forms.

3. The capacity to use the language with maximum attention to *communication* and minimum attention to form
4. The *creativity* of language use

Bachman (1990) stated that traditionally proficiency was defined by assessing language skills (listening, speaking, reading, and writing), and (grammar, vocabulary, phonology, and graphology). Afterward, following the suggestion of the context of discourse and sociocultural factors, proficiency was measured as learners' ability to use language along with making interaction between all these characteristics. Birjandi, Bagheridoust, and Mosallanejad (2000, p. 15) defined proficiency as "the learners' ability to use a language in the real-situation regardless of the way language is learned".

## **1.5.2. Operational Definitions**

### **Task**

In order to conduct this study, six writing activities are used to elicit the learners' writing performance. The first two activities are related to the information-gap tasks in which participants are involved in the process of transmitting information from one part to another, the next two activities are the opinion-gap tasks in which participants have to state their own solutions and thoughts, and the last two ones are the reasoning-gap tasks in which participants have to draw inferences to complete the tasks.

### **Task Complexity**

Increasing the number of elements included in the tasks that make them more complex tasks refers to task complexity. In this study, task complexity is at two levels: simple task and complex task. Tasks with more elements are complex tasks and tasks with few elements are simple tasks.

### **Time Pressure**

In this study, the amount of time given to participants to complete the tasks refers to time pressure. In one group, normal time is given, in the second group, extra time is provided, and in the last group the tasks are completed within lower time than normal time needed for task implementation.

## **Accuracy, Complexity, and Fluency**

In the current study, accuracy is measured as the number of errors per T-unit, syntactic complexity is assessed as the number of clauses per T-unit and, and fluency refers to the number of words per T-unit.

## **Writing Skill**

Written products that participants make as a result of task implementation refer to written performance in this study.

## **Proficiency**

With respect to the score that participants get in Oxford Quick Placement Test (Oxford University Press, 2001), participants' proficiency levels are determined. As a result, proficiency levels refer to the score that participants get in Oxford Quick Placement Test. Since low-intermediate and high-intermediate levels are considered in the current study, those learners who get 30-39 are defined as low intermediates and those who get 40-47 are defined as high intermediates.

### **1.6. Limitations of the Study**

First, the number of L2 learners participated in this study is 60. Because of the small number of the participants, it may seem that the results of this study cannot be generalized to other situations. Second, due to the practicality of the research, the number of tasks completed by the participants is small. Third, in order to do this study, the researcher had to put some delimitations on research. Since