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The Impact of Task Complexity along Single Task Dimension on Iranian EFL Learners' Writing Production

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***Abstract*—This study was designed to explore the manipulation of cognitive task complexity along +/- single task dimension (a resource dispersing dimension in Robinson's triadic framework) on the Iranian EFL learners' writing production in terms of accuracy, fluency, lexical complexity, and syntactic complexity, and put two different views (Skehan's [1998] limited attentional capacity model and Robinson's [2005] cognition hypothesis) into test in the Iranian context. Based on the results of the writing test of TOFEL (2004), 48 learners were selected and assigned into two groups, simple task group (STG, n=24) and complex task group (CTG, n=24). The participants in the STG were given an eight-frame picture arranged in the correct sequence (+ single task). The participants in the CTG were given all the eight frames in scrambled order. These participants were required to order the frames in the right sequence first (- single task). Four independent sample t-tests were run. The results indicated that the participants' output in the complex task were significantly more fluent, more lexically and structurally complex. However, their performance on the accuracy measure decreased in the complex task. Based on the findings, at least in the Iranian context, Skehan's (1998) predictions are more convincing.**

***Index Terms*—triadic componential framework, cognitive task complexity, +/- single task dimension, accuracy, fluency, lexical complexity structural complexity**

I. Introduction

Task-Based Language Teaching (TBLT) has directed many researchers, language teachers, material developers, and syllabus designers' attention to itself. The main strong claim of this approach is that this approach can activate the cognitive and acquisitional processes while learners are busy performing tasks and accomplishing its goal (Skehan, 2003). However, the compelling point is that the developmental and acquisitional processes are involved in the development of both form and meaning simultaneously, while TBLT primarily concerns meaning conveyance; therefore, how can the attention be directed to form as well?

Tasks are nowadays "the potential building blocks of second language instruction" (Richards & Rodgers, 2001, p. 223), and knowing their exact nature is of paramount importance. Various definitions have been proposed by different experts (such as Bachman & Palmer, 1996; Breen, 1989; Bygate, Skehan, & Swain, 2001; Lee, 2000; Long, 1985; Nunan, 1989; Skehan, 1996, 1998; Swales, 1990). Skehan (1996) defines a task as "an activity in which meaning [rather than form] is primary, [and] there is some sort of relationship to real-world activities, task completion has some priority, and assessment of task performance is in terms of task outcome" (Skehan, 1996, p. 38) "not in terms of language display" (Skehan & Foster, 1999, p. 94). Tasks also can enhance the cognitive processes required for the development and acquisition of L2 (Robinson, 2003).

The most challenging question is that what the best criterion for sequencing tasks is. Cognitive approaches, whose focus is on the information processes occurring inside the mind while learner tries to learn L2 (Skehan, 1998), introduce cognitive task complexity as the criterion, due to the fact that learners generate an internal syllabus which is developed heedless of the instruction they receive and the best instruction and syllabus are the one which is compatible with this internal cognitive syllabus (Corder, 1981). Cognitive task complexity is defined as the inherent cognitive demands of the tasks imposed on the learners by the structure of the tasks (Robinson, 2001a). Generally, based on this definition, there are two types of tasks, namely, the simple task which imposes low cognitive processing demands and the complex task which requires more cognitive processing to be accomplished (Ellis, 2003). Therefore, the present study was designed to shed more light on this issue by focusing on one of the dimensions, in the Robinson's (2005) triadic framework, which has not been fully investigated, i.e., +/-single task, and its role on the written performance of the learners in terms of fluency, accuracy, and complexity.

II. Review of Literature

Tasks, as the main units of TBLT, are strongly claimed to be graded in syllabi based on their various characteristics (Robinson, 2001a, 2005, 2007a; Skehan, 1998, 2003). Gilabert (2004) and Robinson (2005) declare that the best criterion for such sequencing in a principled way is cognitive task complexity which is "the result of intentional, memory, reasoning, and other information processing demands imposed by the structure of the task on language learner (Robinson, 2001a, p, 29).Therefore, it pertains to the degree of cognitive demands that the task imposes on the learners while doing the task (Ellis, 2003). Robinson (2005) states "pedagogical tasks [should] be sequenced for learners on the basis of increases in their cognitive complexity" (p. 1) and strongly recommends cognitive complexity as the "theoretically motivated, empirically substantiable, and pedagogically feasible sequencing criteria" (Robinson, 2001a, p. 27) for the purpose of assisting learners in developing a balanced interlanguage regarding accuracy, fluency, and complexity. Many experts (Ellis, 2003, 2008; Robinson, 2005, 2007a, 2007b; Schmidt, 2001; Skehan, 1996, 1998, 2003; VanPatten, 1996, 2007; Wickens, 2007) in cognitive issues referred to *memory* and *attention* as the most important factors in cognitive processes.

A. Attention in Cognitive Processes

Attention is "a cognitive process involving the ability to select and focus on particular stimuli from the environment while ignoring others" (VanPatten & Benati, 2010, p. 65). Two models of attention are propounded:

1. *Single-resource model of attention*: The assumption of this model is that the whole processing capacity is "a *single* 'pool' of resource" (Wickens, 2007, p. 185); therefore, it can be stated that human beings can deal with just one task at a time, and attending to more than one task would be very awkward and sometimes impossible for them. As a result, when they face a challenging task, more attentional capacity of this single resource would be occupied and consumed for the accomplishment of that, and greater pressure would be imposed on attentional capacity. Regarding language learning, while producing language, learners cannot focus on all three aspects of language production, namely, accuracy, fluency, and complexity (Skehan & Foster, 1999). As VanPatten (1996, 2007) declares, while doing some tasks, learners' first attention is on the meaning and content words in input processing, or as Skehan (1998) articulates, on the retrieval of words from the exemplar-based system in language production. So, the dominant focus would be on fluency, while learners are doing a task, at the expense of other aspects of production. This is due to the learners' controlled processing, unlike the native speaker whose processing is mostly automatic, which can overwhelm their attentional resources (Skehan & Foster, 2001). This model of attention is mostly advocated by VanPatten (1990, 2002, & 2007) and Skehan (1996, 1998).

2. *Multiple-resource model of attention*: The other, different, view of attention, being supported by Robinson (1995a, 2001a, 2001b, 2005, 2007a, & 2007b) and Wickens (1980, 2002, 2007), is that attentional capacity is not a container with one single resource, but it is comprised of multiple resources, and depending on resource demands, resource similarity, and allocation policy between the two tasks (Wickens, 2007), human beings utilize one or more than one resources without any interference occurs.

B. Models of Task Complexity

Two different models have been propounded regarding the effect of task complexity on the learners' performance:

1. *Skehan's Limited Attentional Capacity Model*: In this model, Skehan, advocating the single-resource model of attention and proposing dual-mode of processing in which the learners activate both rule-based and exemplar-based systems to different degrees based on the requirements of the tasks, it is claimed "learners cannot attend to everything equally" (Skehan & Foster, 1999, p. 96) and concurrently. As a result, based on the demands of the present context, they prioritize one aspect (for example, the exemplar-based system) over another dimension (such as the rule-based system

According to their model, tasks are meaning based activities; therefore, the dominant attention would be devoted to the fluency and rapid retrieval of ready-made chunks from exemplar-based system. When learners feel they cannot solve the problem just through the exemplar-based system, they utilize their rule-based system; hence, due to various reasons such as task conditions, personal characteristics, or learning and cognitive styles, the remaining attention would be devoted to increase the accuracy or complexity of their production. To put it in other terms, when the cognitive complexity of the task is increased, it is more probable that the learners call even more attention to the meaning conveyance and enhancing their fluency for the purpose of accomplishing the task goal successfully. Since the attentional capacity is limited and is a single pool with the dominant space occupied by the fluency, the leftover attention can be devoted to either accuracy or complexity, so, just one of them can be improved at the expense of the other, meaning that, there is a intra-form tradeoff between retrieving their existing structural features (i.e., accuracy) or constructing new forms based on their existing linguistic features and hypotheses (complexity). On the whole, this model predicts that boosting the complexity of the task would bring about greater fluency along with either greater accuracy or complexity (+fluency, -accuracy, +complexity or +fluency, +accuracy, -complexity).

2. *Robinson's Cognition Hypothesis*: Robinson (2001a, 2005, 2007a, & 2007b), like Wickens (1980, 2002, 2007), advocates the multiple resources model of attention. In his model, he argues that attention can be allocated to various tasks if they do not belong to the same domain. According to this model, there are various resource pools, rather than just one resource pool, and there is no general limitation on utilizing the pools simultaneously; hence, what occurs is switching attention from one resource pool to another, not prioritizing attention; to put it in Robinson's (2001b) terms, it

is "an executive/action control problem" (p. 307), not a "capacity problem" (p. 307). He declares models of attention no longer focus on its limited capacity. In his model, what Robinson (2001a, 2005) pin points is that the augmentation of the task complexity would increase the processing load and this processing would lead to less fluent language; however, this can be compensated by "using specific features of the language code" (Robinson, 2001a, p. 31). To put it simply, the increase in the cognitive complexity of the task would result in the learners' spending substantial attention on the syntactic aspects of their performance, i.e., accuracy and complexity, on the other hand, in the learners' drawing less attention to the meaning and fluency of their language. To sum up, according to cognition hypothesis, if the complexity of the task boosts, based on the procedure of complexification, two different results would come up: either -fluency, +accuracy, +complexity, or -fluency, -accuracy, -complexity.

C. Robinson's Triadic Componential Framework

Based on the cognition hypothesis, Robinson (2001b) introduces a framework consisting of three dimensions, namely, task complexity, task difficulty, and task condition. Table 1 indicates this triadic framework.

TABLE 1.
ROBINSON'S (2005, P. 5) TRIADIC COMPONENTIAL FRAMEWORK

Task complexity (Cognitive factors)	*Task conditions* (Interactional factors)	*Task difficulty* (Learner factors)
(a) resource-directing variables	(a) participation variables	(a) affective variables
e.g., ±few elements	e.g., open/closed	e.g., motivation
±Here-and-Now	one-way/two-way	anxiety
±no reasoning demands	convergent/divergent	confidence
(b) resource-dispersing	(b) participant variables	(b) Ability variables
e.g., ±planning	e.g., same/different gender	e.g., working memory
±single task	familiar/unfamiliar	intelligence
±prior knowledge	power/solidarity	aptitude

Note. "Cognitive complexity and task sequencing: Studies in a componential framework for second language task design," by P. Robinson, P., 2005, IRAL, 43.

As Table 1 presents, one of the dimension is task conditions under which the tasks are accomplished. This concerns the interactive demands of accomplishing tasks. It is comprised of two subparts: participation variables regarding the information-flow (e.g. one-way vs. two-way) and participant variables with respect to familiarity or gender.

The other dimension is task difficulty which is "learners' perceptions of the demands of the task, and is dependent on differences between learners in the cognitive factors (e.g., aptitude, working memory) and affective variables (e.g., anxiety, confidence) that distinguish one leaner from another" (Robinson, 2003, p. 56). This aspect pertains to the learner factors and the way learners perceive the difficulty of the task (Robinson, 2001a, p. 31); therefore, it is an inter-learner variable.

The other major dimension in this framework is task complexity which is defined as "the intrinsic cognitive demands of the task which can be manipulated during task design" (Robinson, 2003, p. 55). These processing demands are imposed by the structure of the tasks on the learners (Robinson, 2001a); therefore, through empirical investigation, it is possible to determine the specific structure of the tasks and predict their potential effect on the learners' performance beforehand. This dimension is an intra-learner variable. Robinson (2001a, 2001b, 2005) predicts increasing the complexity along the Resource-directing variables would bring about less fluency and great complexity and accuracy, i.e., -fluency, +accuracy, +complexity since these dimensions would direct learners' attentional and memory resources to L2 system in order to understand and convey the functional complexity, as a result, their attention to L2 grammaticisation (i.e., accuracy and complexity) in those conceptual domains would increase (Robinson, 2007b) to the detriment of fluency. On the other hand, tasks manipulated along the resource-dispersing dimensions do not "direct learners to any particular aspects of language code" (Robinson, 2005, p. 22) and would give rise to less fluency, accuracy, and complexity, i.e., -fluency, -accuracy, -complexity.

D. Studies into Cognitive Task Complexity

Various studies have been conducted to examine the different dimensions of task complexity. Investigating the role of +/- planning dimension (i.e., the amount of planning time allowed), Ellis (1987) observed that the less the planning time, the less accurately past tense, the regular past, the irregular past, and the copula were utilized. Inspecting the role of planning (pre-task and on-line planning) on L2 oral performance, Yuan and Ellis (2003) formed three groups: 1) group with no pre-task planning time, 2) group with 10 minutes planning time, and 3) group with no pre-task planning time but 'on-line' planning time. The on-line planning time group generated greater structural complexity and more error-free clauses. Structural complexity and lexical complexity of the group with pre-task planning augmented. No significant effect was found for accuracy measures. It seemed that the available time before the task directed the participants' attention towards the fluency and meaning conveyance, while the time available during the task provided opportunities for them to call their attention towards accuracy and monitoring their output.

Gilabert (2007) explored the effect of +/- planning time and +/- Here-and-Now dimensions on oral narratives via using four strips. Based on the findings, In terms of +/- Here-and-Now dimensions, higher accuracy, less lexical complexity, less fluency was observed for - Here-and-Now dimensions. Planning opportunity was found to improve the fluency, lexical complexity, and accuracy of the production. However, no significant effect was reported for the measures of structural complexity.

As is clear, some of the elements in Robinson's (2005, 2007) framework have been investigated to a great extent, such as +/- planning dimension (such as Ellis & Yuan, 2004; Foster & Skehan, 1996, 1999; Skehan & Foster, 1997; Wigglesworth, 2001; Yuan & Ellis, 2003) and +/- Here-and-Now dimension (Berwick, 1993; Ishikawa, 2007; Skehan & Foster, 1999.However, one of the dimensions under the resource- depleting feature, namely +/- single task (i.e., the number of tasks that have to be performed simultaneously), has been somehow unnoticed. Therefore, this study was designed to scrutinize this dimension and find out its effect on the dimensions of written language production (fluency, accuracy, structural complexity and lexical complexity).

III. Null Hypotheses

The present study was designed to investigate the following null hypotheses:

H01. Manipulation of task complexity along single task dimension does not affect the written production of Iranian EFL learners regarding accuracy.

H02. Manipulation of task complexity along single task dimension does not affect the written production of Iranian EFL learners regarding fluency.

H03. Manipulation of task complexity along single task dimension does not affect the written production of Iranian EFL learners regarding lexical complexity.

H04. Manipulation of task complexity along single task dimension does not affect the written production of Iranian EFL learners regarding structural complexity.

IV. Method

A. Participants

The participants of this study will be Iranian EFL learners studying at Ayandegra Institute, in Zanjan.They were selected among both males and females, approximately aged from 16 to 25. The participants were chosen among the learners who had been placed at the upper-intermediate level based on the institute's placement test. While the data were gathered, they studied Summit 1A book and attended their English classes three times a week.

Seventy two Iranian learners took Writing Proficiency section of TOFEL (Educational Teaching Service, 2004). Among them, the scores of 48 students were located one standard deviation below and above the mean (+/-1 SD), and consequently, were considered to be roughly at the same writing proficiency level and participated in this study. These selected participants were assigned to two groups, namely, simple task group (STG) (n=24) and complex task group (CTG) (n=24).

B. Instruments

Three instruments were used in this study. The Test of English as a Foreign Language (TOEFL, EST, 2004), as a renowned standardized language proficiency test, was the first instrument utilized at the beginning of the study to check the homogeneity of their writing proficiency level. However, just the writing section was used, since in this study the researcher's focus was on the writing ability of the students. Just the writing section was used since, as Cooper (1984) argued, if the purpose is to explore the learners' writing abilities, it is required to focus on this skill exclusively, and general proficiency tests is not good indicators of this skill since they more concern recognition and comprehension than production and generation, and comprehension process can be partly detached from the underlying syntactic system and from production" (Skehan, 1998, p. 15).

In this pretest, the participants were asked to write about the following topic in 35 minutes.

Do you agree or disagree with the following statement? Use reasons and examples to support your opinion.

"Universities should give the same amount of money to their students' sports activities as they give to their university libraries"

Next instrument was a narrative task. It is an eight-frame picture (Appendix A), and taken from Yule (1997). It was used in both the simple and complex narrative tasks but in different manners. Narrating stories are tasks "supported by visual material, but which require some degree of organization of material to tell a story effectively" (Skehan & Foster, 1999, p. 98). The learners were asked to narrate the picture using at least 150 words.The picture set was available for them at the time of performing the task, hence, both tasks used in the present study were deemed as contextual embedded (Cummins, 1983, cited in Ellis, 2003, p. 92) and immediate (Skehan, 1998), *Here-and-Now* orientation (Robinson, 2005).

The story was as follows: a woman goes to a supermarket. In the supermarket, she runs into her friend who was shopping with her little son. She starts talking with her. They get so engrossed in talking that they overlook the child. The child is very naughty. He stretches out his hand, takes a bottle, and puts it in the other woman's bag. Two women

say good-bye and separate. The poor lady who does not know what is going on does not pay for the bottle. Therefore, one of the workers sees the bottle in her bag and accuses her of stealing; as a result, she was taken into custody.

The scoring profile (Appendix A) devised by Jacobs, Zinkgraf, Wormuth, Hartfeil, and Hughey's (1981, cited in Weigle, 2002) was the third instrument. It was used to score the participants' written output in the pretest.It is comprised of five components including content, vocabulary, language, organization, and mechanics. According to the profile, the score ranges from 34 to 100.

C. Procedure

Initially, the homogeneity of the participants' writing proficiency was checked. To this end, the writing section of the TOEFL (2004) was administered to the EFL Iranian learners (n=72) as a pre-writing test. Their written performance was rated based on Jacobs et al.'s (1981) scoring profile (Appendix B), which consists of five sub-parts, i.e., content, vocabulary, language, organization, and mechanics (cited in Weigle, 2002) by two skillful teachers. Based on the results, those participants whose scores were between one SD above and below the mean (i.e., between 66.15 and 75.71) (n=48) were deemed to be roughly at the same level of writing proficiency and took part in this study as the main participants.

Then, they were randomly assigned into two groups: simple-task Group (STG) (n=24) and complex-task Group (CTG) (n=24). The participants in the STG were given the whole picture (Appendix A).The frames of this picture had been arranged in the correct sequence before its administration to the participants of this group (+ single task). The participants in the CTG were given all the frames of the picture; however, the frames were not arranged in their correct order; therefore, these participants were first asked to order the frames in the right sequence, and then to start writing about it (- single task= double task).

The participants in both groups were asked to write a story of at least 150 words based on the picture. In both groups, the participants could see the pictures while writing about it (+ Here-and-Now dimension). The picture was administered by their normal teacher, and he or she did not give any special guidance with respect to formal features, organizational points, or the content.

V. Results

The main independent variable of this study was task complexity with two levels (simple task vs. complex task), and the dependent variables were four dimensions of language production, namely, fluency, accuracy, structural complexity and lexical complexity.

The measures used in this study to encode the production dimensions are taken from Larsen-Freeman (2006, p. 597) and are as follows: "the proportion of error-free t-units to t-units" for accuracy, "average number of words per t-unit" for fluency, "average number of clauses per t-unit" for structural complexity, and "word types per square root of two times the words" for lexical complexity.

For the purpose of nullifying or verifying the null hypotheses, four one-independent sample t-tests were conducted. However, before that, eight one-sample Kolmogorov-Smirnov tests and Shapiro-Wilk tests were run to check the normality of the data statistically. The results are shown in Table 2.

TABLE 2.
ONE-SAMPLE KOLMOGOROV-SMIRNOV TESTS AND SHAPIRO-WILK TESTS OF THE PARTICIPANTS' PERFORMANCE ON THE PRODUCTION DIMENSIONS

Production dimensions		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Accuracy	STG	.157	24	**.128**	.913	24	**.071**
	CTG	.152	24	**.155**	.804	24	**.066**
Fluency	STG	.159	24	**.121**	.936	24	**.134**
	CTG	.197	24	**.086**	.922	24	**.064**
Lexical Complexity	STG	.173	24	**.062**	.963	24	**.503**
	CTG	.119	24	**.200**	.955	24	**.349**
Structural Complexity	STG	.109	24	**.200**	.964	24	**.527**
	CTG	.109	24	**.172**	.882	24	**.089**

As seen in Table 2, statistically speaking, the data was normally distributed since all the levels of significance were more than.05 (bold numbers in table2). Table 3 reports the descriptive statistics of participants' performance in the simple and complex tasks regarding the production dimensions.

TABLE 3.
DESCRIPTIVE STATISTICS OF PARTICIPANTS' PERFORMANCE IN TERMS OF FOUR PRODUCTION DIMENSIONS

Production dimensions		N	Minimum	Maximum	Mean	Std. Deviation	Variance
Accuracy	STG	24	.70	.91	.8062	.07158	.005
	CTG	24	.25	.80	.5962	.17984	.032
Fluency	STG	24	6.65	11.35	8.8622	1.48069	2.192
	CTG	24	7.82	20.33	14.0945	4.06084	16.490
Lexical Complexity	STG	24	3.32	5.42	4.2596	.54650	.299
	CTG	24	4.08	6.04	5.0456	.56777	.322
Structural Complexity	STG	24	1.38	2.06	1.6872	.19077	.036
	CTG	24	1.76	4.33	2.7924	.86896	.755

As seen in Table3, regarding accuracy, the means of the data obtained from the simple and complex task groups were .806 and .596 respectively. Regarding fluency, the means of the data obtained from the simple and complex task groups were 8.86 and 14.09 respectively. Concerning lexical complexity, the means of the data obtained from the simple and complex task groups were 4.25 and 5.04 respectively. With respect to structural complexity, the means of the data obtained from the simple and complex task groups were 1.68 and 2.79 respectively.

In order to find out whether these differences between the means of the data in each set were statistically significant or not, four independent samples t-test were run. Table 4 presents the results.

TABLE 4.
THE INDEPENDENT SAMPLES T-TESTS FOR TASK COMPLEXITY ALONG PRODUCTION DIMENSIONS

Production Dimensions		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Accuracy	Equal variances assumed	19.3	.000	5.31	46	.000	.209	.039	.130	.289
	Equal variances not assumed			5.31	30	.000	.209	.039	.129	.290
Fluency	Equal variances assumed	36.615	.00	-5.92	45	.000	-5.31904	.89733	-7.126	-3.51
	Equal variances not assumed			-5.82	27.35	.000	-5.31904	.91253	-7.190	-3.44
Lexical Complexity	Equal variances assumed	.543	.46	-3.2	46	.002	-.55017	.17128	-.8949	-.205
	Equal variances not assumed			-3.2	45.6	.002	-.55017	.17128	-.8950	-.205
Structural Complexity	Equal variances assumed	29.640	.00	-6.0	46	.000	-1.10522	.18160	-1.47	-.739
	Equal variances not assumed			-6.0	25.2	.000	-1.10522	.18160	-1.47	-.731

Table 4 indicates that regarding the accuracy measure, the variance of the groups is not equal; therefore, the second line must be reported, i.e., $t(30) = 5.31$, $p < 0.05$. Since the level of significance is less than .05, it can be stated that the difference between the means of the STG and CTG was statistically significant. Hence, based on the results, the first null hypothesis was nullified.

Regarding fluency, the variance of the groups is not equal; therefore, the second line must be reported, i.e., $t(27.35) = -5.82$, $p < 0.05$. Since the level of significance is less than .05, it can be stated that the difference between the means of the STG and CTG in terms of fluency was statistically significant. Hence, based on the results, the second null hypothesis was nullified.

In terms of lexical complexity, the variance of the groups is equal; therefore, the first line must be reported, i.e., $t(46) = -3.212$, $p < 0.05$. Since the level of significance is less than .05, it can be stated that the difference between the means of the STG and CTG in terms of lexical complexity was statistically significant. Hence, based on the results, the third null hypothesis was nullified.

Regarding structural complexity, the variance of the groups is equal; therefore, the first line must be reported, i.e., $t(25.2) = -6.0$, $p < 0.05$. Since the level of significance is less than .05, it can be stated that the difference between the means of the STG and CTG in terms of structural complexity was statistically significant. Hence, based on the results, the fourth null hypothesis was nullified.

VI. DISCUSSION

Regarding accuracy, the results revealed that the Iranian EFL learners significantly generated less error-free clauses in the complex task. Therefore, it can be declared that +single task can enhance the accuracy of the written production. In this study, in the simple task, there was no substantial cognitive load on the participants, since the frames of the picture had been ordered beforehand (+single task) and the plot of the story had a clear beginning, middle, and end On contrary, in the complex task, they spent some time on figuring out the content of the story which increased the cognitive load of the task. The content was not lucid and they had to make sure of its accurate order. This engagement

in this double task needed even more attentional capacity to be devoted to the content, meaning, and fluency, which lessened their attention to the accuracy of their language and left little capacity for generating more error free units.

The findings can also be explicable through the Levelt's (1989) production stages (i.e., conceptualization, formulation, articulation, and monitoring). In the simple task, the learners had a clear story line before them, and as soon as they received the picture, they could pass the conceptualization stage very easily and go through the formulation stage.

These findings are also in line with the findings of some studies. Reporting less accurate production for the more complex task (the abstract task), Brown et al. (1984) argued that the less the cognitive load was, the more accurate the learners' production was. Crookes (1989) also claimed that more structural errors could be found in the learners' production when more complex tasks were employed. Ellis (1987) declared the preplanning time mostly spent on the conceptualization, and it provided more time for the learners to deal with the accuracy of their production during the task execution, which led to greater generation of grammatical forms.

Task complexity exerted a significant positive influence on fluency.Those in the simple task group produced greater dysfluencies in comparison with those in the complex task. In other words, - single task seems to facilitate the fluency of their output. This result can be explained in terms of Skehan's (1998) limited attentional capacity model. Since meaning is of paramount importance and is a primary goal of a task (Bygate et al., 2001; Lee, 2000; Nunan, 1989; Prabhu, 1987; Skehan, 1996, 1998; Swales, 1990), while performing a task, the learners drew their dominant attention to complete the task successfully. In order to do it as best as they could, they activated their exemplar-based system, which provided opportunities for rapid retrieval of the ready-made chunks (Skehan, 1998). When they could not accomplish the task just by tapping into the exemplar-based system, they utilized their rule-based system (another reason why accuracy lagged behind the fluency). With the increase of the complexity of the task, even more attentional capacity was devoted to the meaning conveyance and content, which, according to Skehan's (1998) predictions, brought about greater fluency.

It can also be stated that in the complex task, while the learners were engaged in ordering the picture frames, more items were activated in their exemplar-based system since they had to make sense of the order. Finding reasons why one frame had to be put after another, they might get a broader view of the story, which helped them generate greater number of words.

Concerning lexical complexity, the participants could produce greater types of words in the complex task, and -single task could have a significant positive effect on lexical complexity. This finding indicates that when the participants were engaged putting the pictures in their correct order in the complex task, they carried out deeper semantic processing in order to find the reasonable order, which might lead to the better activation of their exemplar-based system and made them browse it more deeply. This brought about the retrieval of a greater variety of words from this system at the time of task accomplishment. Ultimately, all of these enhanced the lexical complexity of the output.

This finding is in line with the results reported in Berwick's (1993), Robinson's (1995b), and Yuan and Ellis' (2003) studies. They found the participants in the most complex task generated greater number of words. Robinson (1995b) attributed this finding to the more cognitive load of the task, which gave rise to the retrieval of more items from the memory.

The last research question concerned the effect of manipulating cognitive task complexity on the measure of syntactic complexity. The results indicated that the participants significantly produced a greater number of clauses in t-units while performing the complex task. Therefore, -single task had an obvious impact on the enhancement of the structural complexity.

One possible explanation for this finding is the greater processing load imposed by the complex task on the learners who were struggling to find out the relation among the frames of the picture. Long (1985) claims the utilization of more cognitively demanding tasks would help learners to go beyond their existing interlanguage and extend it as much as they can. As Ishikawa (2007) declares, the imposition of such semantic processing would lead to the complexification of the output in order to overcome and represent this cognitive load in the best possible way. The participants in this study seem to draw their attention towards such complexification and produce more syntactically complex output.

The results of some studies were in consonant with the findings of the present study, such as Gilabert (2007), Iwashita et al. (2001), and Robinson (1995b), Berwick (1993). Almost all of these studies ascribed the greater syntactic complexity to the greater memory demands of the complex task which propelled the learners to think more deeply and to generate larger units of information so as to mitigate the processes of encoding, storing, and retrieving the information from memory.

VII. Conclusion

The present study indicated that the provision of task complexity along +/-single task dimension significantly affected Iranian EFL Learners' written performance qualitatively and quantitatively. Regarding the quantitative aspect, this dimension led to greater fluency gains, and in terms of qualitative aspects, both lexical and syntactic complexity increased due to the manipulation of task complexity. However, the measure of accuracy decreased through the use of a more complex task. The obtained results seem to be more compatible with the limited attentional capacity model (Skehan, 1998, 2003) which declares that the attentional capacity is limited and while doing a task, especially a

cognitively demanding task; learners draw their attention towards to meaning than to formal aspects. Since in this model, the attentional capacity is believed to be a single resource, learners, based on the specific characteristic of the task, can only prioritize accuracy or complexity not both of them, in other words, there is a trade-off between accuracy and complexity, with no detrimental impact on fluency. In the present study, generation of greater complex language in the complex task accompanied with the production of greater fluent language, not greater accurate language.

The findings of this study can shed light on the selection and gradation of the tasks in TBLT syllabi. It shows that via the manipulation of different degrees of the task complexity, teachers can selectively direct learners' attention towards the production dimension in which the learners have problems. This is of great importance because tasks are prone to lead learners' attention to the meaning and fluency; therefore, if there is no way to channel their attention, they would develop unbalanced interlanguage in which accuracy or complexity may lag behind. Enhancing accuracy at the proper time is also very important. The recovery stage (the third stage of learning L2) (Brown, 2000) is a stage in which learners must overcome the culture shock and culture stress, and master the accurate version of L2. If they pass this stage without internalizing the target-like form of L2, such forms will stabilize in their mind and their destabilization will be difficult, if not impossible. Therefore, according to the results of this study, via using more simple tasks, it is possible to draw learners' attention to generating more accurate language.

Although many task-based studies have been undertaken so far, there are still numerous baffling challenges waiting to be solved via future research. Regarding task complexity, a longitudinal research can be conducted in order to explore the ability of the learners in transferring their enhanced ability due to the task manipulation to other contexts and tasks. In order to gain rich description, post-task interviews, questionnaires, retrospective and introspective measures can also be utilized. Future research can evolve around other types of tasks being manipulated along different task features. Even individual differences regarding the learners' learning style, learning strategies can also be taken into account in future research.

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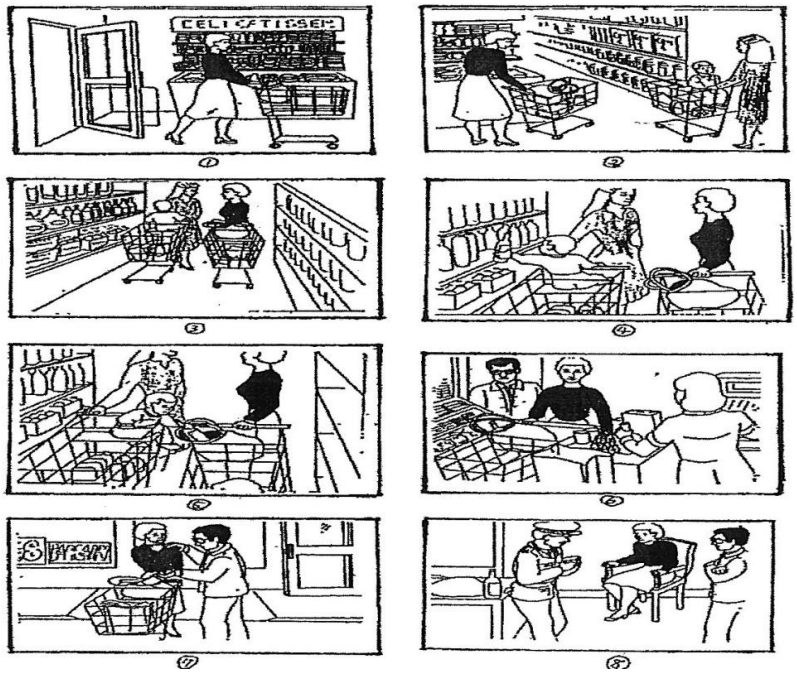
APPENDIX A

Prompt for the simple writing task, taken from Yule (1997)

Begin the story like this: Today, a woman goes to the supermarket…



APPENDIX B

Jacobs, Zinkgraf, Wormuth, Hartfeil, and Hughey's (1981) scoring profile

ESL COMPOSITION PROFILE

STUDENT DATE TOPIC

SCORE	LEVEL	CRITERIA	COMMENTS
CONTENT	30-27	EXCELLENT TO VERY GOOD: knowledgeable • substantive • thorough development of thesis • relevant to assigned topic	
	26-22	GOOD TO AVERAGE: some knowledge of subject • adequate range • limited development of thesis • mostly relevant to topic, but lacks detail	
	21-17	FAIR TO POOR: limited knowledge of subject • little substance • inadequate development of topic	
	16-13	VERY POOR: does not show knowledge of subject • non-substantive • not pertinent • OR not enough to evaluate	
ORGANIZATION	20-18	EXCELLENT TO VERY GOOD: fluent expression • ideas clearly stated/supported • succinct • well-organized • logical sequencing • cohesive	
	17-14	GOOD TO AVERAGE: somewhat choppy • loosely organized but main ideas stand out • limited support • logical but incomplete sequencing	
	13-10	FAIR TO POOR: non-fluent • ideas confused or disconnected • lacks logical sequencing and development	
	9-7	VERY POOR: does not communicate • no organization • OR not enough to evaluate	
VOCABULARY	20-18	EXCELLENT TO VERY GOOD: sophisticated range • effective word/idiom choice and usage • word form mastery • appropriate register	
	17-14	GOOD TO AVERAGE: adequate range • occasional errors of word/idiom form, choice, usage *but meaning not obscured*	
	13-10	FAIR TO POOR: limited range • frequent errors of word/idiom form, choice, usage • *meaning confused or obscured*	
	9-7	VERY POOR: essentially translation • little knowledge of English vocabulary, idioms, word form • OR not enough to evaluate	
LANGUAGE USE	25-22	EXCELLENT TO VERY GOOD: effective complex constructions • few errors of agreement, tense, number, word order/function, articles, pronouns, prepositions	
	21-18	GOOD TO AVERAGE: effective but simple constructions • minor problems in complex constructions • several errors of agreement, tense, number, word order/function, articles, pronouns, prepositions *but meaning seldom obscured*	
	17-11	FAIR TO POOR: major problems in simple/complex constructions • frequent errors of negation, agreement, tense, number, word order/function, articles, pronouns, prepositions and/or fragments, run-ons, deletions • *meaning confused or obscured*	
	10-5	VERY POOR: virtually no mastery of sentence construction rules • dominated by errors • does not communicate • OR not enough to evaluate	
MECHANICS	5	EXCELLENT TO VERY GOOD: demonstrates mastery of conventions • few errors of spelling, punctuation, capitalization, paragraphing	
	4	GOOD TO AVERAGE: occasional errors of spelling, punctuation, capitalization, paragraphing *but meaning not obscured*	
	3	FAIR TO POOR: frequent errors of spelling. punctuation, capitalization, paragraphing • poor.handwriting • *meaning confused or obscured*	
	2	VERY POOR: no mastery of conventions • dominated by errors of spelling, punctuation, capitalization, paragraphing • handwriting illegible • OR not enough to evaluate	

TOTAL SCORE READER COMMENTS

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