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EFFECTS OF COGNITIVE TASK COMPLEXITY ON L2 WRITTEN OUTPUT

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Abstract

The question that which type of writing tasks learners exhibit their skills and improve their language proficiency receives different answers. Whether a language task, which requires attention, memory, reasoning, with low and high levels of syntactic complexity is likely to affect text quality, accuracy, grammar and vocabulary range is debated. The view that higher syntactic complexity for a task is likely to have learners produce more errors (Skehan & Foster, 2001) competes with the view that it will result in better, less flawed writing output (Robinson, 2001). To test the claims of the two views, the study reports on an experiment to investigate whether syntactic task complexity in writing performances is a predictor of text accuracy, syntactic complexity, lexical variation, text length and quality. The data were obtained from two homogenous groups, easy and complex, who were assigned easy and complex writing tasks. The findings reveal that manipulating levels of cognitive task complexity does not have overarching effects on the dependent variables investigated. Nonetheless, tasks requiring higher cognitive skills produced better results on the measures of accuracy and text quality

Key Words: cognitive task complexity, writing, accuracy, syntax, lexicon, length, quality.

İKİNCİ DİLDE KOMPOZİSYON YAZIMINDA BİLİŞSEL ZORLUĞUN ETKİLERİ

Öz

İngilizce öğrenenlerin hangi görev tanımlarında yazma becerilerini daha iyi sergiler ve mevcut dil seviyelerini nasıl geliştirirler sorusuna verilen cevaplar farklıdır. Dikkat, hafıza ve mantık yürütme yükünü yani az ve çok düşünmeyi (yazıda istenen unsur sayısı) gerektiren bir yazma görevinin, yazı kalitesi, hedefe göre yazma,

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metin uzunluğu, gramerdeki hata sayısı ve kelime yelpazesi hususlarını etkileyip etkilemediği tartışılagelmektedir. Görevi zorlaştırılmasının öğrenciyi daha çok hataya yönelteceği görüşü (Skehan & Foster, 2001) ile zorlaştırmanın daha iyi kompozisyon ürünü çıkarabileceğini iddia eden görüş (Robinson, 2001b) yarışmaktadır. Yazma becerisinin gelişiminde bu iki görüşün hangisinin daha isabetli olduğunu anlamaya çalışan bu araştırma, grameri farklı seviyelerde kompozisyon yazması istenen bir öğrenci kompozisyonunun metin tutarlılığının, gramer seviyesinin, geniş yelpazede kelime kullanımını, metin uzunluğunu ve kalitesini belirleyip belirlemeyeceğini inceler. Veri, birbirine benzer iki gruba verilen kolay ve zor kompozisyon yazma görevinden çıkan yazılardan elde edilmiştir. Bulgular, bilişsel görev zorluğunu bilişsel seviyede azaltıp artırmanın bağımlı değişkenler üzerinde ciddi etkileri olmadığını göstermektedir. Ancak, bilişsel görev zorluğu yüksek görev konuya bağımlı kalarak yazma (isabet) ve metin kalitesi ölçütlerinde artış gözlenmiştir.
Anahtar Terimler: bilişsel görev zorluğu, yazma, isabet, sözdizimi, kelime haznesi, uzunluk, kalite

Introduction

In recent decades, many researchers, syllabus designers, and educationalists have called for a stronger emphasis on task-based approaches to language teaching[1]. Task-Based Language Teaching (TBLT), an offshoot of Communicative Language Teaching, refers to a language teaching method that aims at providing a natural context for language use and thus learning through language tasks[2]. Tasks are activities that involve real life-like challenges that require language use for their completion. If both language used to complete the task and the task itself are meaningful and relevant for the learners' overall objective of learning, a positive and dynamic atmosphere is anticipated in the learning/teaching process. In an ambiance formed in this spirit, it is

[1] e.g. D. Nunan, *Designing Tasks for the Communicative Classroom*, Cambridge 1989; M.H. Long- G. Crookes, "Three approaches to task-based syllabus design", *TESOL Quarterly*, 26 (1989), pp. 27-56; G. Crookes- S. Gass, *Tasks in a Pedagogical Context*, Clevedon 1993.

[2] D. Larsen-Freeman, *Techniques and Principles in Language Teaching*, Oxford 2000.

claimed that language instruction underpinning task-based approach is conducive to learning, and learning will be relatively permanent[3].

One primary concern in the application of tasks by teachers appears to be the suitability of tasks for various proficiency levels. Skehan and Foster[4] point out the importance of task choice and the task conditions in which a task is to be completed. Involvement in tasks leads to restructuring of interlanguage and thus improvement during language learning process. This view is also supported by Robinson[5], who emphasizes the importance of task choice and task conditions, and asserts that they are the most powerful vehicles affecting students' achievement and progress in language production. Robinson[6] suggests that units of analysis in TBLT should be "pedagogic tasks or gradual approximations to real world target tasks" such as serving meals in a restaurant, finding a reference book in the library, or taking part in a sports discussion. Achievement in the TBLT is therefore performance-based, not system-referenced and thus it is based on whether and to what degree learners can successfully perform the pedagogic and target tasks that are the focus of instruction[7]. Given the importance of using tasks and arranging the optimum conditions for their execution, teachers need to regularly draw upon the findings from the task

[3] P. Skehan-P. Foster, "Cognition and tasks", *Cognition and second language instruction,* In P. Robinson (Ed.), Cambridge 2001, pp. 183-205.
[4] *İ.b.i.d.,2001.*
[5] "Task complexity, cognitive resources, and syllabus design: A triadic framework for examining task influences on SLA", *Cognition and second language instruction,* In P. Robinson (Ed.), Cambridge 2001a, "Cognitive complexity and task sequencing: Studies in a componential framework for second language task design", *International Review of Applied Linguistics,* 43 (2005), p. 287.
[6] *İ.b.i.d.*, 2001a, p. 289
[7] Robinson, *İ.b.i.d.,* 2001a.

literature so that they keep up with the recent trends concerning the choice of tasks and task conditions to maximize the chances of pedagogically desired level of progress.

1) Task Complexity and Its Cognitive Dimensions

In the cognitive approach to TBLT[8], decisions about sequencing based on the relative complexity of pedagogic task content are key elements in the delivery of task-based instruction. Cognitive task complexity refers to the amount of cognitive processing that is needed for a learner to perform a task[9]. In this sense, task complexity refers to the intrinsic cognitive demands of a task which can be manipulated during task design[10]. It may also be interpreted as the result of the attentional, memory, reasoning, and other information processing demands imposed by the task structure on the part of the language learner[11]. Such an insight is expected to enable teachers to take more pedagogical decisions in the execution of task based teaching.

[8] P. Skehan, "Tasks and language performance assessment", *Researching pedagogic tasks: Second language learning, teaching, and testing*, In Bygate, M., Skehan, P. and Swain, M. (Eds), Harlow UK, 2001; P. Skehan, "Task-based instruction", *Language Teaching,* 36 (2003); Robinson, *İ.b.i.d*, 2001a, P. Robinson, "Task complexity, task difficulty, and task production: exploring interactions in a componential framework", *Applied Linguistics* 22/1 (2001b).

[9] M. Michel,- F. Kuiken, - I. Vedder, "The influence of complexity in monologic versus dialogic tasks in Dutch L2", *IRAL, International Review of Applied Linguistics in Language Teaching*, 45/3 (2007).

[10] P. Robinson,"The cognition hypothesis, task design, and adult task-based language learning", *Second Language Studies*, 21/2 (2003).

[11] Robinson, *İ.b.i.d*, 2001b.

Many researchers[12] investigating the effects of task manipulations in second/foreign language acquisition have been searching for the ways language learners use their attentional resources while dealing with tasks in the target language. Particularly three researchers, Robinson[13] and Skehan & Foster[14], have identified a number of task design factors which can be manipulated so as to achieve different levels of task complexity. Two models have emerged: Cognition Hypothesis[15] and Limited Attentional Capacity Model[16]. What both models have in common is the crucial role of attention and the way attentional resources are used during task completion. They however differ in terms of the way they perceive the quantity of attentional resources (e.g. single or multi-resources) that learners have. Furthermore, their predictions of the effects of increasing task complexity on linguistic performance are quite different. In what

[12] Kuiken - I. Vedder, "Task complexity and measures of linguistic performance in L2 writing", *IRAL,* 45 (2007a); Kuiken-Vedder, "Cognitive task complexity and linguistic performance in French L2 writing", *Investigating tasks in formal language learning,* In Garcia Mayo (ed.), Clevedon UK, 2007b; Kuiken-Vedder, "Cognitive task complexity and written output in Italian and French as a foreign language", *Journal of Second Language Writing,* 17 (2008a); Kuiken-Vedder, "The influence of task complexity on linguistic performance in L2 writing and speaking: The effect of mode", Paper presented at the *32nd Laud Symposium March 10-13*, Germany 2008b; Robinson, *İ.b.i.d*, 2001a; *İ.b.i.d*, 2005; *İ.b.i.d*, 2007; P. Robinson - R. Gilabert, "Task complexity, the Cognition Hypothesis and second language learning and performance", *IRAL, International Review of Applied Linguistics in Language Teaching,* 45/3 (2007); P. Robinson,- J. J. Lim, "Cognitive Load and the Route-marked Map Task Unpublished Data", University of Hawai'I at Manoa, Department of ESL, Honolulu 1993; P. Skehan, "A framework for the implementation of task-based instruction", *Applied Linguistics*, 17 (1996); Skehan & Foster, *İ.b.i.d.,* 2001.

[13] *İ.b.i.d*, 2001a.

[14] *İ.b.i.d.,* 2001.

[15] Robinson, *İ.b.i.d*, 2001a.

[16] Skehan-Foster, *İ.b.i.d., 2001,* p. 168.

follows, these two competing models are reviewed as they have formed the theoretical framework for the present study. The findings of the study will also be discussed in relation to these models.

1.1) Limited Attentional Capacity Model

Various studies carried out by Skehan and his associates have helped pave the way for a model to account for the conditions under which task based learning occurs[17]. The Limited Attentional Capacity Model is based on the conception that attentional resources of learners are limited and thus any increase in the cognitive complexity of tasks and their components reduces the normally available attention capacity to attend to task requirements. In such cases, in which learners' attentional limits are reached or exhausted, they have to prioritize processing for meaning over language form. Skehan & Foster[18] claim that an increase in the cognitive complexity level of a language task will push learners to give much more importance to the content of the output, so the performance – be it oral or written - will be less accurate, since they do not have any attentional resource left to use for the form of the output. The claims of this model have also been supported by van B. Van Patten[19], who was initially

[17] e.g. P. Skehan, *A cognitive approach to language learning*, Oxford 1998a; Skehan-Foster, *İ.b.i.d., 2001;* Skehan-Foster, *İ.b.i.d., 2003*; Skehan-Foster, *İ.b.i.d.,* 2001.
[18] *İ.b.i.d., 2001.*
[19] "Attending to form and content in the input", *Studies in Second Language Acquisition,* 12 (1990).

motivated by the perspective in cognitive psychology that "attention is effortful and [that] humans have limited capacity to deal with stimuli"[20].

Furthermore, Skehan and Foster[21] advocate the idea that successful elicitation of learner language is a product of three main factors: the task, the individual learner, and the situation in which the task is carried out. Therefore, the cognitive factors specified for task complexity cannot predict exactly the actual performance of the individual learner. They identify three sets of factors contributing to the complexity of a task: code complexity, cognitive complexity, and communicative stress. In this frame, 'code complexity' refers to the syntactic and lexical difficulty of language input, while 'cognitive complexity' refers to the processing demands of the task and availability of relevant schematic knowledge, whereas 'communicative stress' is in relation to the result of differentials in time pressure, the modality of task performance, and the scale or number of participants involved.

1.2) Cognition Hypothesis

The second hypothesis, called Cognition Hypothesis[22], is a model which asserts that dimensions of cognitive task complexity belong to different attentional resource pools and thus, an increase in task complexity does not necessarily degrade linguistic output, but instead, it may result in

[20] R. Dekeyser-R. Salaberry-P. Robinson-M. Harrington, "What gets processed in the processing Instruction? A commentary on Bill VanPatten's 'Processing Instruction: An Update", *Language Learning,* 52/4 (2002), p. 806.
[21] *İ.b.i.d., 2001.*
[22] Robinson, *İ.b.i.d*., 2001a; Robinson, *İ.b.i.d*., 2005; Robinson, "Criteria for classifying and sequencing pedagogic tasks" In *Investigating Tasks in Formal Language Learning*, Maria del Pilar García Mayo (ed.), Clevedon 2007.

higher structural complexity and greater accuracy of learner output. Robinson proposes that an increase in the cognitive demands of the task might direct learners' attentional resources to the language form rather than meaning, and in this way, input may be processed more deeply and elaborately. Robinson asserts that learners do not have limited attentional capacity, but instead, there are different attentional resource pools which can be used during task performance. Namely, when the cognitive complexity level of a task is increased, it does not mean that learners will make use of a single resource for completing the task; conversely, they will activate different attentional pools, and thus all these attentional resources will be there for serving to the form of the output as well as meaning. This triadic componential framework makes task classification according to three factors: task complexity, task condition and task difficulty.

Another feature of Cognition Hypothesis is that cognitive factors, interactive factors, and learner factors should all be taken into account while sequencing and grading tasks. In addition to the task complexity and task difficulty explained earlier, Robinson[23] places emphasis on task conditions since participation and participant factors are also highly important during task performance. However, he persistently states that it is the task complexity to be manipulated and used mainly for instructional purposes since interactive and learner factors are difficult or sometimes impossible to be predicted and worked on in advance.

[23] *İ.b.i.d*, 2001a.

In fact, R. Schmidt's Noticing Hypothesis[24] is regarded as the inspiring idea being influential on the formation of such a model since it advocates the position that cognitive task demands are strongly related to what is noticed by the learner. Noticing Hypothesis takes noticing as the first step in language building. In addition, Schmidt's[25] contention that not only comprehensible input and communicative opportunity[26] but also cognitive effort on the part of the learner is required, as L2 learning and development is one of the key components in Robinson's model[27]. Similarly, Robinson[28] assumes that some factors of task demands direct learners' attention to the language form because attention is crucial in L2 learning, since "SLA is largely driven by what learners pay attention to"[29]. For this reason, Robinson assigns an important role to the dimensions of task complexity that can be manipulated systematically during task design with beneficial impacts on L2 performance[30]. In accordance with this model, it is predicted that if task complexity is increased particularly through resource-directing dimensions (i.e. few elements, here-and-now, no reasoning demands), the L2 performance will be more accurate, syntactically more complex, and lexically more varied. In this way,

[24] "Attention", *Cognition and second language instruction*, In P. Robinson (Ed.), Cambridge 2001.
[25] *İ.b.i.d.*, 2001.
[26] M. H., Long "Task, group, and task-group interactions", *University of Hawai'i Working Papers in ESL* 8, 1989, p. 1-26.
[27] *İ.b.i.d*, 2001a.
[28] *İ.b.i.d.*, 2005.
[29] Schmidt, *İ.b.i.d.*, 2001, p. 3.
[30] M. Michel,- F. Kuiken, - I. Vedder, *İ.b.i.d.*

Robinson[31] rejects the idea of "trade-off" effects that Skehan and Foster[32] claim will appear due to the limited attentional capacity of learners.

At first glance, the Cognition Hypothesis and the Limited Attentional Capacity Model seem to be entirely contradictory due to the role they assign to attention and the use of attentional resources during task performance. A closer look at the two models, however, reveals that their conflicting predictions on L2 performance mainly concern the so-called resource-directing dimensions of task complexity[33]. With regard to the resource-dispersing/depleting dimensions, both models agree that attentional resources are limited.

1.3) Written L2 Performance

Second language acquisition literature includes a number of studies related to the effects of task complexity on reading[34] and on oral L2 production[35] However, the number of studies is fewer examining the effects of task manipulations on written L2 performance[36]. Of these,

[31] *İ.b.i.d.*, 2005.
[32] *İ.b.i.d., 2001.*
[33] Kuiken-Vedder, *İ.b.i.d*, 2007b.
[34] e.g. E. Peters, "L2 vocabulary acquisition and reading comprehension: the influence of task complexity", *Investigating tasks in formal language learning*, In Garcia Mayo (ed.), Clevedon UK, 2007.
[35] e.g. R. Gilabert, "The simultaneous manipulation of task complexity along planning time and +/-Here-and-Now: Effects on oral production", *In Investigating Tasks in Formal Language Learning*, Maria del Pilar García Mayo (ed.), Clevedon 2007; Michel et al., *İ.b.i.d.,* 2007; Robinson, *İ.b.i.d*, 2001b; A. RÉVÉSZ, "Task complexity, focus on form, and second language development", *SSLA, Sydney Society of Literature and Aesthetics*, 31 (2009).
[36] (e.g. N. Gökgöz– D. Atay, "The effects of task complexity on measures of accuracy and lexical variety in EFL writing", Paper presented at *the Third Biennial on Task-Based Language Teaching*: *Tasks: content purpose and use.* Lancaster UK, 2009; L.

Kuiken & Vedder[37] and Gökgöz & Atay[38] were examined below, for they have direct relevance to this study.

Kuiken & Vedder[39] conducted a study which involved 84 Dutch learners of Italian and 75 Dutch learners of French, all with Dutch as their first language. Two writing tasks in which cognitive task complexity was manipulated were assigned to the participants that required them to write a letter to a friend regarding the choice of a holiday destination out of five alternatives. Each participant wrote two letters both for the complex and the easy (i.e. non-complex) versions of the task. The researchers tried to find out 1) whether task complexity has an effect on accuracy in terms of task types such as appropriateness errors, grammar errors, lexicon errors, orthography, and so forth, 2) whether task complexity is influential on lexical variation in terms of word frequency, and 3) whether the influence of task complexity on accuracy and lexical variation differ according to the level of L2 proficiency. The results of the study showed that both students of Italian and French produced fewer lexical errors in the complex tasks. That is, the overall increase in accuracy in the complex condition is due to the decrease of lexical errors. Moreover, the students of Italian used significantly higher frequent words in the complex condition whereas the situation is the reverse for the students of French. All this means that

Hamp-Lyons- S. P. Mathias, "Examining expert judgments of task difficulty on essay tests", *Journal of Second Language Writing*, 3 (1994); Kuiken - I. Vedder, *İ.b.i.d,* 2007a; Kuiken - I. Vedder, *İ.b.i.d,* 2007b; Kuiken - I. Vedder, *İ.b.i.d,* 2008a; Kuiken - I. Vedder, *İ.b.i.d,* 2008b.

[37] *İ.b.i.d,* 2007a; *İ.b.i.d,* 2007b; *İ.b.i.d,* 2008a.

[38] *İ.b.i.d.,* 2009.

[39] *İ.b.i.d,* 2007a.

Cognition Hypothesis is valid for the findings of Italian learners while Limited Attentional Capacity predicts the findings for the French learners. Another finding was that the level of L2 proficiency does not bring about a difference in terms of the effects of task complexity on accuracy and lexical variation.

Gökgöz & Atay[40] replicated Kuiken and Vedder's[41] study with 125 Turkish learners of English, freshmen at a university in Turkey. They arrived at similar conclusions: there is an effect of task complexity on accuracy only in terms of appropriateness errors. In addition, although there is not a significant result concerning lexical variation, the researchers have concluded that findings favor the Limited Attentional Capacity Model, which claims that cognitively less complex task results in lexical richness. However, an unexpected result with regard to the level of L2 proficiency was detected. Students at higher proficiency level produced more errors than the students at lower proficiency level did, on which neither Cognition Hypothesis nor Limited Attentional Capacity Model has specific predictions.

Kuiken and Vedder[42] took one step further and included the effects of task complexity on syntactic complexity as well as whether the influence of task complexity on written output is the same for different proficiency levels, besides accuracy and lexical variation, which had been

[40] *İ.b.i.d.,* 2009.
[41] *İ.b.i.d,* 2007a.
[42] *İ.b.i.d,* 2007b.

examined in Kuiken & Vedder[43]. 76 university students learning French participated in the study. According to the results of the study, Skehan and Foster's Limited Attentional Capacity Model predicted a better performance on the less complex task, while Robinson's Cognition Hypothesis was a better predictor of the performance on the more complex task. More specifically, fewer errors were found in the texts produced for the complex task. However, no significant result was identified concerning lexical variation and syntactic complexity. In fact, type-token-ratio was calculated[44] for lexical variation, but since the result of TTR2 (type-token-ratio which does not take text length into account) was not significant, it was concluded that cognitive task complexity does not have an effect on the written L2 performance. Finally, the repeated research question concerning the effects of L2 proficiency was again seen to have failed.

In a study on the effects of planned discourse on the oral and written production, R. Ellis[45] found that increased planning time leads to higher accuracy of rule-based language (i.e. past tense forms of the regular verbs) while unplanned discourse is more lexically varied. Namely, giving planning time leads learners to avoid problematic forms and narrow their productive repertoire to "tried and trusted forms during planning phase"[46] On the other hand, in another study on oral L2 production, Skehan and

[43] *İ.b.i.d,* 2007a.
[44] K. Wolfe-Quintero,- S. Inagaki - H. Kim "Second Language Development in Writing: Measures of Fluency, Accuracy and Complexity", Hawai'i University of Hawai'I at Manoa, Honolulu 1998.
[45] *SLA Research and Language Teaching*, Oxford 1987.
[46] Robinson, *İ.b.i.d.*, 2001b, p. 37.

Foster[47] have shown that planning time contributes learners to produce more fluent speeches including more complex structures. However, they have also expressed that there are "trade-off" effects between complexity and accuracy particularly with narrative tasks since accuracy suffers from the amount of attention devoted to complexity in such kinds of tasks.

The facilitating effect of *+/- prior knowledge* on task performance has received support from the researchers studying on L1 and L2 speech production. As an example, D. A. Good and B. Butterworth[48] found that prior knowledge of a route (i.e. familiar type) resulted in significantly more fluent L1 speech production on a route description task than no prior knowledge (i.e. unfamiliar route). Similarly, in a small-scale study of six Taiwanese learners of English, Y. F. Chang[49] has noticed that a single task including task familiarity led to significantly greater fluency in L2 speech production, but no significant effect was observed on accuracy.

In a study of Robinson and Lim[50], students were asked to describe a route orally to a partner. In the single task condition, speakers were required to give directions from point A to B on a map to a partner and the route was marked on the map for the speaker. However, in the dual task condition, the route was not marked which pushed speaker to think up the

[47] *İ.b.i.d., 2001.*
[48] "Hesitancy as a conversational resource: Some methodological implications", *Temporal Variables in Speech Production,* In H. Dechert and M. Raupach (eds.), Mouton 1980.
[49] "Discourse Topics and Interlanguage Variation", *Representation and Process: Proceedings of the 3rd Pacific Second Language Research Forum,* In P. Robinson (ed.), 1, Tokyo 1999.
[50] *İ.b.i.d.*, 1993.

route first and then describe it to the partner. At the end of the study, no significant results were found concerning accuracy and syntactic complexity; however, the route-not-marked map task was less fluent than on the route-marked task.

In a study on narratives, P. Robinson[51] manipulated the *here-and-now* feature of a task and asked one group of learners to narrate a comic strip in the present tense while looking at it whereas the second group was asked to complete the task in past tense without looking at the strip. The results revealed that the *here-and-now* condition led to more accurate speech, more lexical complexity, less fluency, and no significant result for syntactic complexity compared to the *there-and-then* version of the task. A similar study by M. Rahimpour[52] too aimed at identifying the effects of manipulation in *here-and now* feature on the oral production and came up with a result that complex version of the task (i.e. *there-and-then*) resulted in less fluent and lexically less varied, but more accurate oral production. Again no significant result was found concerning structural complexity.

The last study to be reviewed here was conducted by Kuiken and Vedder[53] with 91 Dutch learners of Italian and 76 Dutch learners of French. The participants were given directions in their L1 (i.e. Dutch) to write a text regarding the choice of a holiday destination out of five options. In the task, some requirements concerning the choice were given, which were

[51] "Review Article: Attention, memory and the 'noticing' hypothesis" *Language Learning* 45 (1995).
[52] "Task condition, task complexity and variation in L2 discourse", *Unpublished PhD dissertation*, University of Queensland, 1997.
[53] *İ.b.i.d,* 2008b.

three for the non-complex version, six for the complex version. The researchers wanted to find evidence regarding the effect of manipulating cognitive task complexity 1) on syntactic complexity, lexical variation, and accuracy of learner output, and 2) on the output of low-and-high-proficient learners. A cloze test was given to the students so as to gather data about their level of L2 proficiency. The data analysis techniques used by Wolfe-Quintero, Inagaki & Kim[54] were used in Kuiken and Vedder[55]. For the students of Italian, the results concerning Error Type-1 and Error Type-2 were found to be significant. It means that there are fewer errors in the texts produced for the complex task. However, in terms of serious language errors, there was not any significant difference. With regard to syntactic complexity, total number of clauses and the number of main and subordinate clauses in the texts were calculated, but no effect of task complexity on syntactic complexity was evidenced. Finally, lexical variation was examined through TTR1 and TTR2. However, although the lexical variation in the complex task measured by type-token-ratio (TTR1) was significantly greater than those in the non-complex one, this finding was not confirmed by TTR2 which takes text length into account. Since participants wrote texts of minimum 150 words, it was TTR2 that should be significant for a reliable and valid result. Thus, the fact that the effects of cognitive task complexity are not related to language proficiency was confirmed once more. In brief, Robinson's Cognition Hypothesis was found to be partially a good predictor in terms of accuracy since increasing

[54] *İ.b.i.d.*, 1998.
[55] *İ.b.i.d,* 2007b.

task complexity led learners to pay more attention to linguistic form and thus make fewer errors (only Error Type-1 and Error Type-2) in their written performance. However, it has noted that neither Cognition Hypothesis nor Limited Attentional Capacity Model is a good predictor of the effects of task manipulations on syntactic complexity and lexical variation.

2) Method

2.1) Study Design

A writing task used by Kuiken and Vedder[56] was chosen for the present study. The authors redesigned it to come up with two versions of it: one easy, the other complex. This was done using the criteria proposed by Robinson[57] for the complexity level of writing task. Easy and complex versions are randomly assigned to the homogenous groups. The writing tasks were administered to the learners under the same conditions and the written output were analyzed in a way to reflect students' use of their attentional resources while completing a given writing task.

2.2) Participants

The general English proficiency students at English Preparatory Unit at Hacettepe University, Turkey, took part in the study. These students need to pass the proficiency exam (equivalent of upper intermediate level) to be able to continue to their designated undergraduate courses such as economics and engineering. While choosing the

[56] *İ.b.i.d,* 2008a.
[57] *İ.b.i.d*, 2001a.

participants, convenience sampling method was employed, which involves the sample being drawn from that part of the population which is close to hand[58]. That is, a sample population is selected because it is readily available and convenient. Since the researcher herself is an instructor at this institution and the students were already determined to be intermediate level learners of English according to the placement exam of School of Foreign Languages, two classes were chosen: one in which one of the authors taught, and the other was a colleague's class, which also included intermediate level learners of English. Sample population included 23 males and 17 females with an age range of 18 to 21. Participants' 7 to 11 years of language learning experience has been limited to classroom use, typical of foreign language settings.

2.3) Instruments

Five writing tasks were pre-selected to work on and decide which one of them was the most appropriate one for the purposes of this study. Four of them were taken from the books *Writing Interactions 1*[59] and *Writing Interactions 2*[60], while the final writing task was taken from a previously conducted study[61]. Having determined that they were all communicative and real-life topics, they were manipulated according to the criteria put forward by Robinson[62]. Taking the criteria into account,

[58] F. J. Gravetter– L. B. Forzano, *Research Methods for Behavioral Sciences*, US, 2009.
[59] C. Pavlik– M. Segal, *Interactions 1-Writing Students Book*, US 2006a.
[60] C. Pavlik– M. Segal, *Interactions 2-Writing Students Book*, US 2006b.
[61] Kuiken - I. Vedder, *İ.b.i.d,* 20078a.
[62] *İ.b.i.d*, 2001a.

one cognitively easier and one cognitively more complex versions for each writing task were designed by the authors. Three independent raters, each experienced in teaching writing, were asked to judge, using a checklist, all five tasks in terms of easiness and complexity. The stipulated easy and complex versions of the fifth task, the one used by Kuiken & Vedder[63], were unanimously agreed upon by all the raters, and so this was the task administered to the participants. The tasks required that the participants write argumentative letters of at least 150 words in which they had to convince a friend regarding the choice of a holiday destination out of five possibilities. In the easy version of the task, learners were expected to choose one of the five holiday destinations given in the task sheet and convince a friend that it would be the best choice for their holiday plans. However, the complex version of the task required learners to take into account a varying number of criteria for their choice such as the presence of a garden, a quiet location, the proximity to the city center, the possibility of doing physical exercise, swimming facilities, and the availability of breakfast.

A pilot study on four randomly selected students was conducted to ensure that participants could easily understand what the task required them to do, that instructions were of their level of understanding, and finally that participants could produce rich enough data on the task. Based on data obtained for easy and complex versions, two colleagues together with the researchers decided the three criteria (above) set were met. And

[63] *İ.b.i.d,* 2008a.

so, the authors proceeded to collect data from the two groups for the experiment.

2.4) Data Collection Procedure

Both the researchers and the class instructor cooperated fully and willingly. Since the researcher and the instructor of the other class would simultaneously collect data in different classes, the researchers gave the class instructor some information concerning the administration of the tasks. She was reminded that all participants would be asked to volunteer for this activity and then she would start to assign the task. Furthermore, the instructor was informed that she would repeat the task instruction in Turkish so as to make sure that all participants knew what they were expected to do. In the selected classes, the participants were asked to volunteer to take part in this writing activity in class. Further assurance was given that their written performance would be kept confidential. Participants were asked no to write any personal information on the writing task sheets (name, number, class, etc.). The group that received the complex task was not given any time for planning before writing and they were asked to start immediately to complete the task in 40 minutes, whereas the group that received the easy measure was given five minutes of preparation.

2.5) Data Analysis

To identify error types, clause types, and complex words, a coding system consisting of symbols was utilized. This coding system helped researchers to group and classify the data in order to answer the first research question on accuracy, syntactic complexity, and lexical variation,

respectively. In what follows, procedures followed for data analysis are explained.

Error types are classified according to the seriousness of the errors in terms of their communicative function. Namely, if an error makes the sentence incomprehensible, difficult to understand, or create ambiguity, these kinds of errors are called as Error Type 1 (E1). For example, "*I am sure they are probably delicious and healthy*" (taken from a student's text). This kind of error is an example of inconsistency creating ambiguity. If an error does not fully make the text incomprehensible or one that is not expected from an intermediate level learner, then it is called as Error Type 2 (E2). The sentence "*So we can relax in there*" can be a good example for this type of an error. Errors relating to spelling and punctuation are called as Error Type 3 (E3). The sentence "*I think Bed and **Brakfast** Hotel Migani Spiaggia is the most suitable for us*" can be given as an example.

Next, in order to investigate the level of syntactic complexity, the number of clauses was calculated for each text. Here, the aim was to find out whether students preferred different sentence types in accordance with the complexity level of the given writing task. That is, the researchers tried to understand whether the complexity of a given task pushed learners to produce more complex sentences and students dealing with easy version of the task preferred to form simple sentences while writing their texts. The researcher divided the clauses into two groups as main clause and subordinate clause since the number of subordinate clauses would particularly reflect that those texts including more subordinate clauses

were syntactically more complex than the ones with fewer subordinate clauses.

Thirdly, a list of 1.000 frequently used English words[64] was taken as a reference while determining whether a word used in the text was a complex or an easy one. Namely, the level of lexical variation in a given text was ascertained according to this criterion: absence or presence of a word in the list of 1.000 frequently used English words. While analyzing the data, each word which did not exist in the given list was accepted as a complex one.

On the other hand, a holistic rubric prepared by PALS (2004) - Performance Assessment for Language Students - was used in order to measure the quality of the produced texts. To be able to answer the second research question, the writing task scoring sheet "Level 1" by PALS[65] was decided to be the appropriate one with the help of a colleague who has been teaching academic writing for several years. Since there would be the possibility that the researchers might be familiar with the produced texts since they would be working on them for a long time, the assessment of the texts according to this writing task scoring sheet made by an outside rater so as to ensure objectivity. Then, the scores given for each text were evaluated in accordance with the holistic rubric provided by PALS[66].

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[64] E. B. Fry,- J. E. Kress, - D. L. Fountoukidis, *The Reading Teacher's Book of Lists*, New Jersey, 2000.

[65] Performance Assessment for Language Students. Foreign Language Program of Studies. Fairfax County Public Schools. Retrieved December 5, 2009 from http://www.fcps.edu/DIS/OHSICS/forlang/PALS/rubrics/

[66] Pals, *i.b.i.d., 2004.*

Finally, so as to find an answer to the second part of the second research question, that is text length, the number of words included in each produced text was calculated and then the averages both for easy and complex versions of the task were compared. During the analysis part, the calculations mentioned above were all estimated to 100 so as to have validity and reliability. Since the instruction on the writing task says “at least 150 words”, some of the participants might write more than 150 words. Data were analyzed with SPSS 13.

3) Results

Our first research question concerns the effects of task manipulations on accuracy, syntactic complexity and lexical variation on the written output of the students. It has been found that cognitive task complexity affects various aspects of linguistic performance to different degrees. Results are presented in Table 5.

Descriptive statistics reveal that the complex group made fewer errors on Error Type 1 and 2, but more on Type 3. Overall, complex task writers produced more accurate output, which is an important finding. Keep in mind that Error Type 3 is more of an academic challenge than a linguistic one. However, independent samples t-tests failed to produce any significant demarcation between the accuracy levels of the easy and complex writers. Nonetheless, the difference between the groups on Error Type 1 ($p< 0.052$) came extremely close to qualify for meaningful difference, only missing by a tiny margin: 0.002. Given the great difference between the means for both groups (Complex Error M= 1.66

and Easy Error Mean = 2.40), we would like to consider this a significant difference.

Table 5 Performance comparisons between easy and complex tasks

Measure Type	Measure	Complex		Easy		*t*	d.f.	*Sig. (2-tailed)*
		Mean	S.D.	Mean	S.D.			
Accuracy	E_{tot}	9.54	4.57	10.23	4.99	.457	38	.650
	E1	2.39	1.66	3.71	2.40	2.009	38	.052
	E2	2.49	1.85	2.91	1.54	.782	38	.439
	E3	4.55	2.68	3.64	1.95	-1.220	38	.230
Syntactic Complexity	C_{tot}	14.52	3.05	13.60	2.26	-1.083	38	.286
	MC	10.37	2.33	9.85	2.27	-.715	38	.479
	SC	4.14	2.03	3.75	1.68	-.674	38	.504
Lexical Variation	CW	18.03	4.07	20.19	5.45	1.417	38	.165

On syntactic complexity, complex task writers used more Subordinating Clauses than the easy task writers, as average mean figures reveal: M=4.14 and M=3.75, respectively. This difference is not a significant one. As for the lexical richness that might occur under the impact of the task, interestingly, it was the easy task group that used more complex words (i.e.

words that are not found in the 1.000 word list): M = 20.19, as opposed to M = 18.03 of the complex task writers.

To answer the second research question on text quality and length, students' written performance was evaluated out of 24 points by an outside rater by means of a holistic writing rubric. As seen in Table 6, the difference in text quality is statistically significant. Namely, the written texts produced for the complex task were found to be of higher quality than the ones written for the easy task.

Table 6 Performance comparison on text quality and length

Measure Type	Measure	Complex		Easy		*t*	d.f.	*Sig. (2-tailed)*
		Mean	S.D.	Mean	S.D.			
Text Quality	TQ	86.57	7.70	74.04	10.16	-.4.31	38	.000*
Text Lenght	WN	187.85	52.13	201.70	60.37	.776	38	.442

* $p < .05$

On the other hand, when the average numbers of words in student texts were compared for easy and complex tasks, it was seen that the difference in text length in written output is not statistically significant. That is, the effects of cognitive task complexity are not related to the length of the produced texts.

In the holistic rubric, a number of aspects were graded such as task completion, comprehensibility level of discourse, vocabulary, language control, and mechanics. The average grade given to the texts written for easy task is 74.05 whereas it is 86.57 for the complex task. These numbers equal to two different ranges (74% - 83%, meaning "*almost meet expectations*" and 84% - 93%, meaning "*meets expectations*") according to the criteria determined by the testing unit at Fairfax County Public Schools. Texts written for the easy task belong to the first range (74% - 83%) since the average given to these papers is 74.05. This means that the texts produced for the easy task "almost meet the expectations" since the texts include undeveloped ideas, and thus force the reader to make interpretations in an effort to understand the content, they are full of repetitive sentences, spelling, punctuation, and capitalization mistakes, and incorrect use of vocabulary items. In addition, the sentence structures used in those texts are at the basic level. On the other hand, the texts written for the complex task belong to the second range (84% - 93%) since the average given to these papers is 86.57. In this respect, the same table above indicates that the texts produced for the complex task exactly "meet the expectations" since these texts include ideas which are adequately developed, require minimal interpretation on the part of the reader, they are full of various sentence structures and some cohesive devices, the vocabulary items are used accurately, and there are fewer spelling, punctuation, and capitalization mistakes.

4) Discussion

4.1) Accuracy, Syntactic Complexity, Lexical Variation

The first research question asked: "What is the effect of manipulating cognitive task complexity on accuracy, syntactic complexity, and lexical variation of learners' written output?" No significant difference was located between the texts written for easy and complex writing tasks in terms of total number of errors, Error Type 2, and Error Type 3; however, the difference concerning Error Type 1 (the errors which make the text almost incomprehensible) came very close to the significance level (p = 0.052). If we consider the difference on Error Type 1 significant, one of the predictions of the Cognition Hypothesis appears to have come true: Cognitively more complex, demanding and challenging tasks force writers to take on the task more seriously and thus make fewer errors. Such a finding supports the proposition that increasing task complexity along resource-directing and resource-dispersing variables leads learners to pay more attention to linguistic form; it in turn makes the written output become more accurate. An alternative conclusion might be that increasing cognitive task complexity does not result in a better written performance and linguistic development, but it leads learners to have more control over their existing interlanguage systems and thus make fewer mistakes. The fact that increased complexity has no significant positive effect on syntactic complexity and lexical variation but a little effect in accuracy also shows that an increase in cognitive task complexity may lead learners to produce a text which is correct but not necessarily more syntactically and lexically varied.

These results largely echo the findings of Kuiken & Vedder[67], and Kuiken & Vedder[68]. In their study on the effects of task manipulation on the linguistic performance of French L2 writing, Kuiken and Vedder[69] found that cognitive task complexity has an impact in terms of Error Type 1. However, they also found out that it made a difference in terms of total number of errors and Error Type 2. Even though the current study too shows that the averages of total number of errors and Error Type 2 are more in easy task than those in the complex version, these differences are not statistically significant. This may be the direct result of the fact that the number of participants in the current study is limited to 40 students. Therefore, this number may not be enough to make the statistical differences significant for the components of accuracy except for Error Type 1. Namely, if the number of participants had been more than 40, as was the case in[70], which involved 167 Dutch university students taking French or Italian as a second language, the differences concerning accuracy in the written output could be more significant right now.

When viewed from this aspect, it may reflect that in line with the predictions of Cognition Hypothesis, cognitive task complexity may have an impact on the written output in terms of important language errors, which make the texts almost incomprehensible. In this case, it means that increasing task complexity along resource-directing and resource-dispersing variables leads learners to pay more attention to the linguistic

[67] *İ.b.i.d,* 2007b.
[68] *İ.b.i.d,* 2008a.
[69] *İ.b.i.d,* 2007b.
[70] Kuiken - I. Vedder, *İ.b.i.d,* 2007b.

form; it in turn makes the written output become more accurate. An alternative conclusion might be that increasing cognitive task complexity does not result in a better written performance and linguistic development, but it leads learners to have more control over their existing interlanguage systems and thus make fewer mistakes.

When the written performances of the learners were evaluated in terms of the syntactic complexity, there is not a significant difference between cognitively more demanding and less demanding tasks in terms of total number of clauses (p = .230, that is, $p > 0.05$), main clauses (p = .479, that is, $p > 0.05$), and subordinate clauses (p = .504, that is, $p > 0.05$). Literature is also in line with these results[71]. Clearly, syntactic complexity in foreign language writing cannot be explained either by Cognition Hypothesis or Limited Attentional Capacity Model since there is not any indication of difference between the texts written for the two task types. In fact, the averages concerning the total number of clauses, main clauses, and subordinate clauses for the complex task are higher than those of easy task, and thus it seems as if Robinson's Cognition Hypothesis was proven to be true; however, these differences cannot be regarded as significant in terms of statistics. Perhaps, the number of participants may also be influential again. With a larger population under investigation, these differences might turn out to be more significant.

As far as lexical variation is concerned, a different method was used in the previous studies concerning the effects of cognitive

[71] Kuiken - I. Vedder, *İ.b.i.d,* 2007b; Kuiken - I. Vedder, *İ.b.i.d,* 2008b; Kuiken – I. Vedder, 2005.

complexity[72]. The researchers preferred to calculate type-token ratio for each text; that is, they find the frequency of each word used in a text (token) and the total number of different words used in the text (type) and their ratio is used as an indication of lexical variety. However, since researchers could not find a statistically significant difference in the previous studies, another method for analyzing lexical variation was used in the current study and each word in the texts were checked whether they belong to the most frequently used 1000 English words or not. Yet, even this change in organization did not result in a significant difference considering lexical variation and no difference was found in students' written performances since $p = .165$, that is, $p > 0.05$.

This may also be interpreted as the direct result of students' attitudes who were dealing with both task types. While analyzing the texts written for easy and complex tasks, it was realized that almost all students had a tendency towards copying certain phrases and expressions from the task sheets which had been given as extra information about the hotels offered in the tasks. Since most of them used similar or sometimes the same expressions or phrases in the task sheets, it is quite normal that the results related to lexical variety are almost the same for both task types.

Given that no significant difference was found between easy and complex tasks with regard to syntactic complexity and lexical variation, findings do not provide any evidence in support of the predictions made by Skehan & Foster's Limited Attentional Capacity Model and only

[72] Kuiken - I. Vedder, *İ.b.i.d,* 2007b; Kuiken - I. Vedder, *İ.b.i.d,* 2008b.

partially support those made by Robinson's Cognition Hypothesis. Considering the previous studies carried out by Kuiken & Vedder[73], the researcher had thought that assigning different versions of the same task to the same population at different times was not logical since there was the risk of being familiar with the topic, expressions, and so forth on the students' behalf, and this might be the explanation of why they could not come up with a statistically significant difference. For this reason, in the current study, the target populations were taken as two different groups who were equal in terms of their proficiency level. However, even this change in organization could not reveal a significant difference. So it is clear that there is not a direct impact of task complexity on written L2 performance. Of course, this does not mean that we should completely refuse Robinson's Cognition Hypothesis and Skehan and Foster's Limited Attentional Capacity Model. It would be premature to totally reject them; however, it would be better that task complexity should not be taken as the only predictor of written performance but it should also be supported with learner factors and other affective factors so as to see a clearer view concerning this issue.

The fact that it has no effect in syntactic complexity and lexical variation but a little in accuracy also shows that an increase in cognitive task complexity may lead learners to produce a text which is correct but not necessarily more syntactically and lexically varied. In line with these results, the first research question "What is the effect of manipulating

[73] *İ.b.i.d,* 2008a; *İ.b.i.d,* 2007b.

cognitive task complexity on accuracy, syntactic complexity, and lexical variation of learners' written output?" was answered and thus the first hypothesis in the study -the manipulations in the cognitive task complexity lead to greater syntactic complexity, more lexical variation, and greater accuracy in the written output- is proven not to be totally true. Only partially, considering the findings for error type 1 in accuracy, it can be interpreted as true.

4.2) Text Quality and Length

According to the statistical analysis of text quality grading, it was found that $p = .000$, that is, $p < 0.05$. Hence, it has been proven that there is a statistically significant difference between the texts written for easy and complex tasks. That is to say, the texts written for the complex version of the task were found to be in better quality compared to the ones produced for the easy version of the task.

When the lengths of the texts written for the easy and the complex versions of the task were compared through the independent samples t-test, the result was not statistically significant ($p = .442$, that is, $p > 0.05$). As a result, it can be stated that task manipulations do not affect the length of the produced text. However, there is another point which may contribute to the understanding why task manipulations are not effective in text length. While analyzing the collected data, it was revealed that some of the students could not produce a text of minimum 150 words. This incompetence may also indicate that cognitive task complexity might be in relation with the level of second language writing proficiency as could be

expected on the basis of the Threshold Hypothesis[74]. In accordance with this hypothesis, J. Cummins[75] claims that a child needs to achieve a certain level of proficiency or competence in the first of second language and a minimum threshold needs to be achieved in order to remove the negative consequences concerning a specific language skill. In the current study, even though all participants in the study were determined to be intermediate level English learners, their L2 writing proficiency or even L1 writing proficiency may differ. In this case, it is quite normal that some of them are not competent enough to produce a text of minimum 150 words.

Within the scope of the second research question, the effects of cognitive task complexity on the quality and the length of the produced texts were evaluated. The statistical analyses have put forward that more demanding writing tasks (complex tasks) which require the use of more attentional resources lead learners to produce better quality texts in terms of task completion, comprehensibility, level of discourse, vocabulary, language control, and mechanics.

However, the results also illustrate that these task manipulations do not necessarily mean that students who are dealing with complex writing task will produce longer texts compared to the ones who are assigned the easy version of the task. As explained above, this may be in relation with the L1 or L2 writing proficiency levels of the students which could be

[74] "Cognitive/academic language proficiency, linguistic independence, the optimum age question and some other matters", *Working Papers in Bilingualism,* 19 (1979).
[75] *İ.b.i.d.*, 1979.

supported with the ideas developed within the Threshold Hypothesis by Cummins[76]. Although this hypothesis needs to be verified by some other studies and thus cannot be regarded as the sole explanation of the results found for text length, it is clear that cognitive task complexity does not have a significant impact on the written output in terms of text length; however, it should not be disregarded that the number of participants is also worth considering. With larger population under investigation, different results concerning the effects of task complexity as for the text length may be obtained.

In this respect, the second hypothesis "Cognitive task complexity pushes learners to show better quality written performance and produce longer texts compared to the easy tasks" is proven to be partially true since it is found in the current study that students produce better quality texts when they are assigned cognitively more demanding tasks; however, this challenge does not necessarily force them to produce longer texts in comparison to the ones who are assigned the easy version of the writing task.

4.3) Suggestions for Further Research

In future studies on the effects of task manipulations on written performance, the variable 'text quality' might be divided into subgroups and the written performances might be analyzed for each subgroup so as to see exactly in which aspects the written output becomes better or worse. Furthermore, since writing ability is in close relationship with a number of

[76] *İ.b.i.d.*, 1979.

other factors and this study is cross-sectional in nature, it may not be enough to come up with solid results and make generalizations concerning the relationship between task manipulations and L2 written performance. An investigation of the effects of task complexity by means of a longitudinal design where a continuous treatment which involves gradually increased cognitive complexity of tasks is applied may contribute more to the understanding of the effects of the variables. In addition, it would be logical that possible interactions between learner type and task manipulation should also be paid attention since some learners might benefit more from such manipulations than others. Moreover, there are some other aspects of written performance worth considering. For example, in this study no attention was paid to the actual content or argumentative force of the text. No assessment was made so as to see the effects of task complexity on these aspects or other higher-order writing skills such as cohesion or coherence of the produced text. Perhaps the real difference in terms of task complexity between easy and complex tasks lies behind higher order writing skills. Therefore, future studies might incorporate these aspects.

Conclusion

In the current study, the achievement in foreign language writing was analyzed through five variables: accuracy, syntactic complexity, lexical variation, text quality, and text length. In both models mentioned above, the researchers make certain predictions specifically for accuracy,

syntactic complexity, and lexical variation. While Robinson[77] asserts that cognitively more demanding tasks lead learners to produce more accurate, syntactically more complex, and lexically more varied texts, Skehan & Foster[78] disagree with this idea because they believe in the existence of limited resources for learners to use during language production. Therefore, they think that if the task is easier, students feel safer and show more accurate, syntactically more complex, and lexically more varied written performance. When the research findings are considered, there is almost no evidence for the predictions of the both models. Only very few findings related to the accuracy of the text (specifically related to Error Type 1) seems to support the assertions of Robinson's[79] Cognition Hypothesis similar to the other studies carried out on foreign/second language writing[80]. This means that neither Cognition Hypothesis nor Limited Attentional Capacity Model is a better predictor of achievement in foreign language writing.

On the other hand, these two models do not make any predictions specifically on text quality and text length. However; accuracy, syntactic complexity, and lexical variation are also included within the holistic rubric used for evaluating text quality (in the form of different subtitles such as task completion, comprehensibility, level of discourse, vocabulary, language control, and mechanics), and since a significant positive result was found regarding the relationship between cognitive task complexity

[77] *İ.b.i.d*, 2001a.
[78] *İ.b.i.d., 2001.*
[79] *İ.b.i.d*, 2001a.
[80] Kuiken - I. Vedder, *İ.b.i.d,* 2007b; Kuiken et al, *İ.b.i.d*., 2005.

and the quality of the written text, it can be proposed that the findings related to text quality are in parallel with the ideas underlying Robinson's[81] Cognition Hypothesis. In this respect, although none of the models above exactly predicts the effects on task complexity on written output, Robinson's[82] Cognition Hypothesis is a better predictor of student achievement in foreign language writing as the variable "text quality" in a way includes accuracy, syntactic complexity, and lexical variation in the written texts. Findings may help syllabus designers, text book writers and teachers include appropriate writing tasks for learners as well as sequence and grade writing tasks from a cognitive perspective.

[81] *İ.b.i.d*, 2001a.
[82] *İ.b.i.d*, 2001a.

References

1) Yayımlanmış Kaynaklar

CHANG, Y. F., "Discourse Topics and Interlanguage Variation", *Representation and Process: Proceedings of the 3rd Pacific Second Language Research Forum,* In P. Robinson (ed.), 1, Tokyo 1999, 235-241.

CROOKES, G. - S. Gass (eds.), *Tasks in a Pedagogical Context*, Multilingual Matters, Clevedon 1993.

CUMMINS, J., "Cognitive/academic language proficiency, linguistic independence, the optimum age question and some other matters", *Working Papers in Bilingualism*, 19 (1979), 197-205.

DEKEYSER, R.-R. Salaberry-P. Robinson-M. Harrington, "What gets processed in the processing Instruction? A commentary on Bill VanPatten's 'Processing Instruction: An Update", *Language Learning,* 52/4 (2002), 805-823.

ELLIS, R., *SLA Research and Language Teaching*, Oxford University Press, Oxford 1987.

FRY, E. B.- J. E. Kress, - D. L. Fountoukidis, *The Reading Teacher's Book of Lists*, Prentice Hall, New Jersey, 2000.

GILABERT, R., "The simultaneous manipulation of task complexity along planning time and +/-Here-and-Now: Effects on oral production", *In Investigating Tasks in Formal Language Learning*, Maria del Pilar García Mayo (ed.), Multilingual Matters, Clevedon 2007, 44–68.

GÖKGÖZ, N. – D. Atay, "The effects of task complexity on measures of accuracy and lexical variety in EFL writing", Paper presented at *the Third Biennial on Task-Based Language Teaching*: *Tasks: content purpose and use.* Lancaster UK, 2009.

GOOD, D. A - B. Butterworth, “Hesitancy as a conversational resource: Some methodological implications”, *Temporal Variables in Speech Production,* In H. Dechert and M. Raupach (eds.), The Hague: Mouton, 1980.

GRAVETTER, F. J. – L. B. Forzano, *Research Methods for Behavioral Sciences*, Cengage Learning Inc, US, 2009.

HAMP-LYONS, L.- S. P. Mathias, “Examining expert judgments of task difficulty on essay tests”, *Journal of Second Language Writing*, 3 (1994), 49–68.

KUIKEN, F.- I. Vedder, “Cognitive task complexity and linguistic performance in French L2 writing”, *Investigating tasks in formal language learning*, In Garcia Mayo (ed.), Multilingual Matters, Clevedon UK, 2007b.

_____, “Cognitive task complexity and written output in Italian and French as a foreign language”, *Journal of Second Language Writing,* 17 (2008a), 48-60.

_____, “Task complexity and measures of linguistic performance in L2 writing”, *IRAL,* 45 (2007a), 261-284.

_____, “The influence of task complexity on linguistic performance in L2 writing and speaking: The effect of mode”, Paper presented at the *32nd Laud Symposium March 10-13*, Germany 2008b.

LARSEN-FREEMAN, D. *Techniques and Principles in Language Teaching,* Oxford University Press, Oxford 2000.

LONG, M. H. - G. Crookes, “Three approaches to task-based syllabus design”, *TESOL Quarterly,* 26 (1989), 27–56.

LONG, M. H., “Task, group, and task-group interactions”, *University of Hawai’i Working Papers in ESL* 8 (1989), 1-26.

MICHEL, M.- F. Kuiken, - I. Vedder, “The influence of complexity in monologic versus dialogic tasks in Dutch L2”, *IRAL, International Review of Applied Linguistics in Language Teaching*, 45/3 (2007), 241.

NUNAN, D. *Designing Tasks for the Communicative Classroom*, Cambridge University Press, Cambridge 1989.

PAVLIK, C. – M. Segal, *Interactions 1-Writing Students Book*, McGraw-Hill, US 2006a.

PAVLIK, C. – M. Segal, *Interactions 2-Writing Students Book*, McGraw-Hill, US 2006b.

PETERS, E., “L2 vocabulary acquisition and reading comprehension: the influence of task complexity”, *Investigating tasks in formal language learning*, In Garcia Mayo (ed.), Multilingual Matters, Clevedon UK, 2007.

RAHIMPOUR, M., “Task condition, task complexity and variation in L2 discourse”, *Unpublished PhD dissertation*, University of Queensland, 1997.

RÉVÉSZ, A., “Task complexity, focus on form, and second language development”, *SSLA, Sydney Society of Literature and Aesthetics,* 31 (2009), 437-470.

ROBINSON, P. - J. J. Lim, “Cognitive Load and the Route-marked Map Task Unpublished Data”, University of Hawai’I at Manoa, Department of ESL, Honolulu 1993.

ROBINSON, P. - R. Gilabert, “Task complexity, the Cognition Hypothesis and second language learning and performance”, *IRAL, International Review of Applied Linguistics in Language Teaching*, 45/3 (2007), 161.

ROBINSON, P., “Cognitive complexity and task sequencing: Studies in a componential framework for second language task design”, *International Review of Applied Linguistics,* 43 (2005), 1-32.

ROBINSON, P., "Criteria for classifying and sequencing pedagogic tasks" In *Investigating Tasks in Formal Language Learning*, Maria del Pilar García Mayo (ed.), Multilingual Matters, Clevedon 2007, 7–26.

ROBINSON, P., "Review Article: Attention, memory and the 'noticing' hypothesis" *Language Learning* 45 (1995), 285-331.

ROBINSON, P., "Task complexity, cognitive resources, and syllabus design: A triadic framework for examining task influences on SLA", *Cognition and second language instruction*, In P. Robinson (Ed.), Cambridge University Press, Cambridge 2001a, 287–318.

ROBINSON, P., "Task complexity, task difficulty, and task production: exploring interactions in a componential framework", *Applied Linguistics* 22/1 (2001b), 27-5.

ROBINSON, P., "The cognition hypothesis, task design, and adult task-based language learning", *Second Language Studies*, 21/2 (2003), 45-105.

SCHMIDT, R., "Attention", *Cognition and second language instruction*, In P. Robinson (Ed.), Cambridge University Press, Cambridge 2001, 3-32.

SKEHAN, P., "A framework for the implementation of task-based instruction", *Applied Linguistics*, Oxford University Press, 17 (1996), 38-62.

SKEHAN, P., "Task-based instruction", *Language Teaching*, 36 (2003), 1-14.

SKEHAN, P., "Tasks and language performance assessment", *Researching pedagogic tasks: Second language learning, teaching, and testing*, In Bygate, M., Skehan, P. and Swain, M. (Eds), Pearson Education, Harlow UK, 2001, 167-185.

SKEHAN, P., *A cognitive approach to language learning*, Oxford University Press, Oxford 1998a.

SKEHAN, P.-P. Foster, “Cognition and tasks”, *Cognition and second language instruction*, In P. Robinson (Ed.), Cambridge University Press, Cambridge 2001, 183-205.

VAN PATTEN, B., “Attending to form and content in the input”, *Studies in Second Language Acquisition*, 12 (1990), 287-301.

WOLFE-QUINTERO, K.- S. Inagaki - H. Kim “Second Language Development in Writing: Measures of Fluency, Accuracy and Complexity”, Hawai’i University of Hawai’I at Manoa, Honolulu 1998.

2) İnternet Kaynakları

PALS (2004). Performance Assessment for Language Students. Foreign Language Program of Studies. Fairfax County Public Schools. Retrieved December 5, 2009 from http://www.fcps.edu/DIS/OHSICS/forlang/PALS/rubrics/