Task Complexity and

Students' Narrative Writing

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Abstract

This article is a theoretical review writing. It explores some studies on the effects of task complexity on written narrative production under different task complexity conditions by EFL learners at different proficiency levels. Task complexity was manipulated along Robinson's (2001b) proposed task complexity dimension of Here-and-Now (simple) vs. There-and-Then (complex) in. Accordingly, three specific measures of the written narratives were targeted, i.e. complexity, accuracy and fluency (CAF). The results of some experts' research indicated that with respect to complexity and accuracy, the effects of both task complexity and language proficiency were found significant. More complexity and accuracy were found in the complex task with high-proficiency learners. However, no significant effect of task complexity and language proficiency on fluency was found. The pedagogical implications are discussed with reference to the influence of task complexity and language proficiency on text quality.
Keywords: task, complexity, fluency, accuracy, narrative writing.

Introduction

A central issue in task-based language learning concerns the influence of task complexity on linguistic performance. Several studies have investigated the effect of task complexity on different aspects of linguistic performance at different levels of L2 proficiency (e.g., Robinson 1995; Robinson 2001; Skehan & Foster 1999; Rahimpour 1997; Yuan & Ellis 2003; Gilabert 2005). Most of these studies have focused, however, on oral proficiency. There have only been few studies that have considered the question of how the complexity of a writing task might influence the quality of the text resulting from this task. In the literature on both L1 and L2 writing, it has been suggested that some task types result in lower test scores than others (Hamp-Lyons & Mathias 1994); however,

the relationship between task complexity and writing performance is by no means clear. Task complexity "is the result of the attentional, memory, reasoning, and other information processing demands imposed by the structure of the task on the language learner" (Robinson 2001: 28). One pedagogical challenge is then how teachers, dealing with both task complexity and language proficiency variables, can adjust their online pedagogical interventions. Therefore, developing the empirical knowledge base for this difficult pedagogical decision making is no doubt valuable.

Kuiken (2008) attempted to examine the effects of task complexity manipulation and language proficiency level on L2 written task performance. A well-known model of task complexity was put to the test, i.e. the 'Triadic Componential Framework' known as 'Cognition Hypothesis' proposed by Robinson (2001). Cognition hypothesis claims that if dimensions of cognitive task complexity belong to different attentional resource pools (e.g., memory and attention), increases in task complexity along the so-called resource directing variables (e.g., +/- few elements, +/- Here and Now, +/- reasoning demand) lead to higher complexity and greater accuracy of learner's output. More specifically, the research tries to examine the extent to which complexity, accuracy, and fluency (CAF) of written output by EFL learners at different proficiency levels are influenced by manipulating the complexity of the task. Accordingly, the effect of manipulating complexity of tasks along the resource-directing variable of +/- Here-and-Now on narrative written production in English was examined. The findings of this study can help us indicate how the three dimensions of production (CAF) compete for attention during L2 task performance across two levels of task complexity (Here-and-Now vs. There-and-Then) and two levels of proficiency (High vs. Low), and their possible interactions simultaneously.

Task difficulty, a dimension which is lacking in the Limited Attentional Capacity Model, comprises learners' perceptions of the demands made by the task and is determined by the abilities (intelligence, working memory, language aptitude) and affective responses (anxiety, motivation, confidence) that learners bring to the task. Both the Limited Attentional Capacity Model and the Triadic Componential Framework distinguish a number of dimensions and variables by which task complexity is determined (see Table 1).

Table 1. *The Limited Attentional Capacity Model vs. the Triadic Componential Framework (adapted from Kuiken & Vedder 2007: 264)*

Limited Attentional Capacity Model

1. Code complexity
• Vocabulary load and variety
• Redundancy and density
2. *Cognitive complexity*
Cognitive familiarity

• Familiarity of topic and its predictability
• Familiarity of discourse genre
• Familiarity of task
Cognitive processing

• Information organization
• Amount of computation
• Clarity and sufficiency of information given
• Information type
3. Communicative stress

• Time limits and pressure
• Speed of presentation
• Number of participants
• Length of text used
• Type of response
• Opportunities to control interaction

Triadic Componential Framework

1. Task complexity
Resource-directing
• +/-Few elements
• +/- Here-and-Now
• +/- No reasoning demands
Resource-dispersing
• +/- Planning
• +/- Single task
• +/- Prior Knowledge
2. Task conditions
Participation variables, e.g.,
• Open/ closed
• One-way/ two-way
• Convergent/ divergent

Participant variables, e.g.,
• Same/ different gender
• Familiar/ unfamiliar
• Power/ solidarity
3. Task difficulty
Affective variables, e.g.,
• Motivation
• Anxiety
• Confidence
Ability variables, e.g.,
• Working memory
• Intelligence
• Aptitude

Complexity, Accuracy, Fluency (CAF), and Language Proficiency

Following Wolfe-Quintero, Inagaki, & Kim (1998), Larsen- Freeman (2006) states that most of the measures that have been used in developmental studies consist of intuitive operationalizations of complexity, accuracy and fluency. The underlying assumption is that these indices develop in tandem, i.e. as learners become more

proficient, they write more fluently, more accurately and the texts they produce are more grammatically and lexically complex.

Kuiken, Mos and Vedder (2005) manipulated task complexity by varying the number of elements to be considered in a writing task. Specifically, they asked Dutch learners of Italian with high and low proficiency levels to write a recommendation letter to a friend about where to visit for a holiday. Five

destination choices were given and the participants were required to choose only one based on a varying number of criteria (i.e., three in the simple and six in the complex task). They examined three categories of L2 production measures: syntactic complexity; lexical variation; accuracy. Their results showed that there were no task complexity effects on lexical and syntactic complexity. In contrast, analyses on accuracy data yielded significant interactions between task complexity and proficiency; namely, greater written accuracy was observed when task complexity and proficiency were both high. The low proficiency group was generally unaffected by varying the degree of task complexity. Similarly, Kuiken & Vedder (2007) conducted a study on L2 proficiency in writing among 84 Dutch university students of Italian and 75 students of French. In their study, task complexity was manipulated along two variables of Robinson's Triadic Componential Framework, the number of elements which have to be taken into account and the reasoning demands posed by the task. Accuracy, syntactic complexity and lexical variation measures were used to analyze linguistic performance. Two writing tasks were assigned to the learners in which cognitive complexity was manipulated. Students were grouped according to their proficiency level as established by their cloze scores. The Italian and French students were divided into low and high proficiency groups. The participants were required to write a letter to a friend regarding the choice of a holiday destination out of five options. In the letter a varying number of requirements had to be taken into account, six in the complex and three in the non-complex condition. A minimum of 150 words was set as the criterion. They found a main effect for task complexity on lexical errors, i.e. both students of Italian and French produced fewer lexical errors in the complex task. This means that the overall increase of accuracy in the complex condition is mainly due to a decrease of lexical errors. The students of Italian used significantly more high frequent words in the complex task (and hence more infrequent words in the noncomplex task), whereas for the students

of French they noticed more infrequent words in the complex task. Further, no interaction effect between task complexity and

proficiency level was found.

Kuiken & Vedder (2008) conducted another study similar to their study in 2007 in which 91 Dutch university students of Italian and 76 students of French performed two writing tasks with prompts of differing cognitive complexity. The Italian and French students were divided into low- and high-proficiency groups. Linguistic performance was operationalized in terms of syntactic complexity, lexical variation, and accuracy. The study provided support for the Cognition Hypothesis insofar as the written products of the cognitively more demanding task turned out to be more accurate, with significantly lower error ratios per T-unit than those of the cognitively less demanding task. They concluded that (a) with regard to syntactic complexity and lexical variation, hardly any significant differences were found between the complex and non-complex tasks; (b) no interaction of task type and proficiency level could be observed. This result was in contrast with an earlier finding that the effect of task complexity on accuracy measures was stronger for high-proficiency learners (Kuiken, Mos & Vedder, 2005); and (c) that manipulation of

task complexity affects accuracy but not syntactic complexity and lexical variation.

Moreover, Kawauchi (2005) investigated the effect of strategic planning and language proficiency on L2 oral narrative production by Japanese college students. The participants of her study constituted three different proficiency groups: Low EFL, High EFL, and Advanced ESL. Using a within-subject experimental design, she

compared L2 oral narrative production under unplanned and planned conditions. Analyses were conducted using four categories of production measures: accuracy; structural complexity; lexical variation; fluency. The main findings of her study were that regarding structural complexity and lexical

variation, High EFL learners received the greatest benefits, whereas Low EFL learners gained the most in accuracy terms.

Further, Ishikawa (2006) examined the effects of task complexity and language proficiency on L2 written narrative production based on the analyses of 52 written narratives produced by Japanese high school students under different task complexity conditions. Both lowand high-proficiency groups were formed in each task complexity condition. That is, to investigate the effects of task complexity and proficiency on written task performance, four modes of production metrics were employed as dependent variables: accuracy, structural complexity, lexical complexity and fluency. The results showed that the low-proficiency learners seemed to receive greater benefits when task complexity was manipulated from HERE and NOW (HN) to THERE and THEN (TT). Of particular significance were the consistent results that the four aspects of the low-proficiency learners' performance in the TT condition were by no means inferior to the high-proficiency learners' in the HN condition. Furthermore, the results of the analysis of target-like use of English articles showed that the low-proficiency learners received approximately doubled benefits compared to the high-proficiency learners when task complexity was manipulated from HN to TT (approximate growths of 12 % vs. 6 %).

Tasks which differ along the Here-and-Now/There-and-Then dimension clearly require the participants to distinguish between the temporality of reference (present versus past), and to use distinct deictic expressions (*this*, *that*, *here*, *there*) to indicate immediately present, versus absent objects. As Cromer (1974) and others have noted, this sequence of conceptual and linguistic development takes place in L1 acquisition of English. Children first make reference to the Here-and-Now [simple] and at a later point to the There-and-Then [complex], and a similar sequence of linguistic development has been observed in L2 acquisition (Robinson, 2005: 5).

Through writing the narrative task, one of the proposed task complexity

dimensions "Here-and-Now (HN) (simple)" versus "There-and-Then (TT) (complex)" was operationalized. The participants of the two groups of HP-HN and LP-HN were presented with a prompt in present tense and the participants of the two groups of HP-TT and LP-TT were presented with a prompt in past tense.

Kuiken (2008) stated that the effects of task complexity and language proficiency on various aspects of writing performance were investigated. Regarding the first research question, the ratio of clauses per T-unit (complexity) was significantly higher in the complex condition than in the simple one; on the other hand, the high-proficiency participants produced more complex written narratives and outperformed the low proficiency participants in a statistically significant manner.

With respect to the accuracy of L2 written narratives, the ratio of error-free T-units per total T-unit (accuracy) was significantly higher in the complex task than in the simple one. Moreover, the high proficiency participants' written narratives were significantly more accurate than the low-proficiency participants'.

The findings on the two measures of complexity and accuracy confirm Robinson's (2001) Triadic Componential Framework (Cognition Hypothesis) in the sense that an effect of increasing task complexity on complexity, and accuracy was found. This means that increasing task complexity along resource-directing variables (e.g., ± few elements, ± Here-and-Now, ± no reasoning demands) leads learners to pay more attention to complexity and form in their written outputs. In other words, making a writing task more complex leads to a greater degree of complexity and higher accuracy of the written text. Both the depend ant variables of complexity and accuracy were affected positively by manipulating the complexity of the narrative writing task.

This finding is in line with Robinson's (2007) 'multi resources' view of attention in that learners' attention could be directed positively to both

complexity and accuracy at the same time and without any trade-off effects. To make it clear, the multiple resources model proposes that learners can access multiple noninterfering cognitive resources simultaneously (e.g., verbal and spatial-figural working memory, working memory used for coordination and supervision, working memory used for storage) and can, therefore, keep focused on both accuracy and complexity while performing a task. The greater the cognitive demands of a task, the more they engage multiple cognitive resources (attention and memory), which lead to more incorporation of forms in the input and modification of problematic forms in the output. Accordingly, the participants performed in a significantly improved fashion in terms of complexity and accuracy on the There-and-Then (complex) task.

Furthermore, the observed increase in the written complexity of narrative outputs in the There-and-Then condition may be ascribable to the increased conceptual activation during the output planning stage, or what Berman & Slobin (1994, cited in Ishikawa, 2006: 208) call "relating events in narrative." In other words, as learners in the TT condition need to memorize and retrieve the storyline and details, and subsequently produce a coherent narrative, they may be pushed to ruminate on the storyline, to infer the relationships between events, and to create larger informational chunks to facilitate memory encoding, storage and retrieval. This is similar to Bartlett's (1932, cited in Ishikawa, 2006, p.200) conception of "effort after meaning," which helps to establish elaborated semantic representations prior to task performance. Thus, task demands in the TT condition may encourage deeper semantic processing than those in the HN condition, which may establish more elaborated output plans, out of which more complex language can emerge.

As for the role of language proficiency, the results showed that the high proficiency learners received greater benefits in terms of higher accuracy and complexity indices in doing writing tasks than the low proficiency learners (Wolfe-Quintero et al. 1998; Larsen-Freeman 2006). Similarly, Cummins (1979,

cited in Sercu, DeWachter, Peters, Kuiken, & Vedder, 2006) found no significant effect of task complexity for low proficiency participants. It seems likely that for low proficiency participants, who still have to deal with basic formulation processes, even the simple task is already extending their inter language to its maximum. As a consequence, the high-proficient participants outperformed the low-proficient participants.

Finally, regarding fluency, no significant effect from the independent variables was found. This does not support Robinson's cognition hypothesis that increasing complexity along There-and-Then condition affects fluency negatively. Robinson (1995) claimed that during TT task performance, learners need to recall the events at the same time that they code the stories propositionally (i.e. at the same time that they access propositional knowledge, organize it, and code it), and establish transitions between events. When narrating displaced events, in the past and without contextual support, learners need to build semantic schema about the whole narrative which is not present before them; therefore, attention is devoted to achieving inter propositional coherence, which slows down fluency considerably. Moreover, with respect to fluency, the results do not confirm Ishikawa (2006) in that participants produced more words per T-unit in the complex (TT) task. One explanation for this discrepancy could be that fluency does not require attention in the same way that complexity and accuracy do. In other words, "higher fluency is not the consequence of attention allocation policies, as complexity and accuracy would be, but the consequence of more efficient message planning and faster lexical access and selection" (Gilabert 2005: 332).

Conclusion

The results of the research generally show the significant effects of increasing task complexity and language proficiency on complexity and accuracy. The overall results seemed compatible with Robinson's Cognition Hypothesis which indicates that not only L2 learner's attentional capacity limits

is not a necessary cause of decrements in performance on complex tasks, also it claims that learner's attention could be directed to both complexity and accuracy simultaneously without trade-off effects.

The other thing found that task complexity manipulations and second language proficiency accounted for large but distinctly separate portions of the variance in the qualities of the narratives participants produced in their second language writing task performance. As there were no significant interactions between the two factors, these analyses indicate that task complexity and second language proficiency each makes quite different impacts on the processes and products of writing in a second language.

In addition, it can be implied that the complexity of tasks can be manipulated during task design to target some specific dimensions of production. In other words, by manipulating the tasks along certain task complexity variables (e.g., +/- resource-directing, +/- resource dispersing), a significant degree of greater complexity and accuracy or higher fluency may be observed. Moreover, it is safe to propose that carefully controlling task complexity during task design may contribute to the balanced development of the different dimensions of L2 production (i.e. complexity, accuracy, and fluency).

The results of some studies imply that the skills involved in writing are highly complex, and therefore L2 writers need to be proficient in a variety of skills in order to write effectively (Wolfe Quitero et al., 1998, Richards, & Renandya, 2002). In particular, they have to pay attention to the "higher level skills of planning and organizing as well as the lower level skills of spelling, punctuation, word choice, and so on. Accordingly, syllabus designers in their efforts to make the syllabuses (particularly syllabuses for writing courses) more flexible need to include different types of tasks for different higher-level and lower-level skills and sub-skills. Such syllabus es can be of a mainly task-based or task-supported type. This study presents additional evidence for the view that task complexity manipulation is a useful form of pedagogical practice in motivating the learner to produce more advanced forms of their L2 (Long & Crookes 1992; Robinson 2003, 2007). According to Robinson (2001a), when task complexity is increased along the resource-directing dimensions, the demands on language use can be met by the specific aspects of the linguistic system. Such processes, directing learners' attentional and memory resources to the way the L2 structures and codes concepts, can lead to inter language development'

Commonly the researchers suggested that the future studies need to take task-performer variables such as motivation, learner style, and other individual

learner differences into account, which may constitute important indicators of task performance. The study of L2 task-based strategies and the choice of strategies when the learner faces various types of task demands should be a point of focus. Such studies would help develop a more comprehensive model of task complexity.

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