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Effects of task complexity on the fluency and lexical complexity in EFL students' argumentative writing

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Abstract

Based on Robinson's (2001a,b, 2003) Cognition Hypothesis and Skehan's (1998) Limited Attentional Capacity Model, this study explored the effects of task complexity on the fluency and lexical complexity of 108 EFL students' argumentative writing. Task complexity was manipulated using three factors: (1) availability of planning time; (2) provision of ideas and macro-structure; and (3) draft availability. All participants were randomly assigned to the above three factors in which the availability of the planning time factor had 4 levels (extended pre-task, pre-task, free-writing, and control); the provision of the ideas and macro-structure factor had 3 levels (topic, ideas, and macro-structure given; topic and ideas given; and topic given); and the draft availability factor had 2 levels (draft available vs. draft unavailable) using their writing task proficiency scores as a measure. Results showed that: (1) increasing task complexity, with respect to the planning time continuum, produced significantly greater fluency II (mean number of words produced per minute of the total time spent on the task) and lexical complexity; (2) increasing task complexity, through the provision of ideas and macro-structure, produced significantly greater lexical complexity but no effect on fluency I (mean number of words produced per minute of transcription) or fluency II; and (3) increasing task complexity, through draft availability, produced no significant differences in fluency and lexical complexity. Implications of these findings are discussed.

Keywords: Task complexity; Cognitive processing; L2 writing quality; Fluency; Accuracy; Lexical complexity; Chinese EFL student writers

Introduction

Much has been discussed about task complexity in second language acquisition (SLA) research, particularly regarding how tasks hold a place in SLA research and language pedagogy (see Bygate, 1999; Ellis, 2003; Robinson, 2003, 2005; Schmidt, 1993; Skehan & Foster, 2001; Tavakoli & Foster, 2008). However, the question of how task-based research relates to writing theory, research, or pedagogy has yet to be answered given that most task-based research has focused on oral language production.

From a theoretical perspective, a review of several existing writing models such as Flower and Hayes (1980), Bereiter and Scardamalia (1987), and Kellogg (1996) showed that these models made no predictions with regard to the manipulation of cognitive processes (such as planning, transcribing, and revising) on writing quality. This gap in writing research could be partially filled by task-based research, given its focus on the effects of the manipulation of task factors on task performance. More precisely, we believe that task-based research can shed light on what learners allocate their limited attentional and memory resources to, how task manipulation affects the cognitive processing of

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writers, and how this manner of resource allocation may impact the resulting text in terms of writing quality, which are crucial concerns in L1 and L2 writing research. In this respect, the writing models mentioned above posit that writing processes, such as planning, transcribing, and revising, occur in short term memory (Bereiter & Scardamalia, 1987; Flower & Hayes, 1980) or working memory (Hayes & Nash, 1996; Kellogg, 1996). It is also suggested that there is always a control or monitoring of processes component, for example, the ''monitor'' in Flower and Hayes (1980) and the ''central executive'' in Kellogg (1996). However, to date it is far from clear what exactly happens in the central executive during task execution, a gap in research that can be partially filled by task-based research.

The study presented here is framed within current SLA theories of task complexity and it constitutes one further attempt to investigate the effects of manipulating several task factors on task performance in a single experimental study. In order to situate our research, we first review the two recent competing theoretical frameworks on task complexity in task-based SLA research: Robinson's Cognition Hypothesis (2001a, 2001b, 2003, 2005, 2007) and Skehan's Limited Attentional Capacity Model (Skehan & Foster, 1999, 2001).

According to Robinson (2001a, 2001b, 2005, 2007), task complexity refers to the cognitive task features which can be manipulated either to increase or decrease cognitive demands placed on the learners when they perform a task. In Robinson's (2001b) definition, ''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'' (p. 29). Robinson (2001b, 2005, 2007; see also Robinson & Gilabert, 2007) identified the features of tasks contributing to task complexity in his Triadic Componential Framework. His Cognition Hypothesis is based on information processing theories proposed by Long (1996), Schmidt (2001), and Wickens (1989, 1992). Task complexity in this Triadic Componential Framework encompasses two key dimensions, resource-directing and resource-dispersing, which are thought to impact task performance and learning differently. The resource-directing dimensions make conceptual demands whilst the resource-dispersing dimensions make procedural demands on learners. In his task complexity framework (Robinson, 2003, 2005), the resource-directing dimensions include whether the task requires learners to make reference to events in the past or events in the present, whether the task requires learners to make reference to few or many elements, and whether the task requires learners to use spatial reasoning. The resource-dispersing dimensions include whether or not planning time is given to learners, whether or not prior knowledge is provided in the task, and whether a single task or multiple tasks are carried out concurrently by learners.

Robinson (2001a, 2005, 2007) claims that an increase in task complexity with respect to the resource-directing dimensions (e.g., ± here and now, ± reasoning demands, ± few elements) will lead to more accurate and complex oral production as learners have to attend to the conceptual or functional demands of the task, but will lead to a lower fluency, as learners have to deliberately and explicitly process language. In contrast, it is posited that an increase in task complexity with respect to the resource-dispersing dimensions (e.g., ± planning, ± prior knowledge, and ± single task) will lead to less fluent, accurate, and complex oral production because learners' attention will not be directed to any particular aspects of the linguistic system to meet the increased task demands. Instead, learners are expected to automatically access their already established interlanguage system (Bialystok, 1991, 1994; Robinson, 2005, 2007). It is argued that increasing task demands with respect to the resource-dispersing dimension will constrain the attentional and working memory resources of learners and divert them away from focusing on critical aspects of solving the task. This will not only lead to a depletion of learners' attentional and memory resources, but also result in deteriorated task performance (Gilabert, 2007; Michel, Kuiken, & Vedder, 2007; Robinson, 2003, 2005; Robinson & Gilabert, 2007).

Skehan's (1998, 2001, 2003) Limited Attentional Capacity Model is based on theories of working memory proposed by Carter (1998) and Gathercole and Baddeley (1993). The basic assumption of this model is that humans have a limited information processing capacity and that more demanding tasks require more attentional resources from learners, thus resulting in trade-off effects among the three aspects of language production: accuracy, fluency, and complexity (Skehan & Foster, 1999, 2001, 2005). Skehan (1998) claims that an increase in cognitive task complexity will divert learners' attention to the development of the content of the task, instead of focusing their attention on the complexity and accuracy of their language production. In a similar vein, VanPatten (1990) notes that, as learners' working memory is limited, they may have difficulty in attending to both form and meaning concurrently and, accordingly, learners will prioritize content over form. These researchers argue that content will be traded off for accuracy and complexity, and vice versa (Foster & Skehan, 1996; Skehan & Foster, 1997; VanPatten, 1990). However, the accumulation of task-based research studies over the years has pointed to contradictions on which aspects of language production are being traded off (see Yuan & Ellis, 2003, pp. 3–4).