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Effects of Task Complexity and Planning on L2 Spoken Performance and Attentional Allocation to Meaning and Form of Korean High School Students
Effects of Task Complexity and Planning on L2 Spoken Performance and Attentional Allocation to Meaning and Form of Korean High School Students

by

JISU RYU

A Thesis Submitted to the Department of Foreign Language Education in Partial Fulfillment of the Requirements for the Degree of Master of Arts in Education

At the Graduate School of Seoul National University

February 2017
The present thesis explored combined effects of task complexity (controlled through +/- here-and-now) and planning on performances of Korean high school students with low-intermediate L2 speaking proficiency in two areas: spoken performances in terms of complexity, accuracy and fluency (CAF) and cognitive psychological performances of attentional allocation to linguistic aspects during planning.

In this study, 40 eleventh-grade Korean high school students with low-intermediate English speaking proficiency completed four sets of picture description tasks in different conditions: simple no planning (SN), complex no planning (CN), simple planning (SP) and complex planning (CP). In order to investigate the students’ planning processes, the learners were instructed to complete the questionnaires after the planned conditions (SP and CP).

According to the results of the study, task complexity and planning were shown to influence diverse aspects of CAF; that is, task complexity positively influenced syntactic complexity and accuracy with solely syntactic complexity reaching a significance level, while negatively influencing lexical complexity and fluency with solely the decrease in lexical complexity being statistically significant. With respect to planning, syntactic complexity and fluency were considerably higher, whereas accuracy and lexical complexity were slightly negatively affected. Along with the individual effects of the two IVs, interaction effects on lexical complexity and accuracy were observed; that is, learners’
productions were positively influenced on these aspects to a substantial degree, while neither of the two factors solely had a significant impact in the two aspects.

In addition to the learners’ performance scores (i.e., CAF), individual learners’ responses to the questionnaires in SP and CP provided evidence of visible changes in learners’ attentional allocation depending on tasks differing in complexity; despite their predisposition towards meaning in planned conditions, particularly in the simple planned condition (SP), learners’ attention—which was likely employed inefficiently—was successfully directed to formal aspects in the complex planned condition (CP) given the combined effects of resource-directing (i.e., +/-here-and-now) and resource-dispersing (i.e., strategic planning) dimensions in CP.

The findings of the present study suggest the following pedagogical implications: a) various pedagogical goals may be obtainable through differential manipulation of resource-directing and/or dispersing dimensions; b) learners should be encouraged to adopt a positive attitude toward planning to maximize the potential benefits of planning; and c) an awareness about the nature of learners’ L2 speaking performances needs to be developed to encompass multiple factors in accounting for their observed performances.

Key Words: cognition hypothesis, trade-off hypothesis, speaking task design, manipulation of task complexity, simultaneous manipulation of resource-directing and resource-dispersing dimensions.

Student Number: 2015-21846
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CHAPTER 1.
INTRODUCTION

This chapter introduces the current research by stating the purpose of the study in Section 1.1. Definition of terms, research questions and the overall structure of the research are presented in Sections 1.2, 1.3, and 1.4 respectively.

1.1 Purpose of the Study

Over the past two decades, Task-based Language Teaching (TBLT) has received a significant amount of attention (Gass, 2013; Lantolf, 2000; Long, 1996, 2000; Long & Crookes, 1992; Long & Robinson, 1998; Swain, 1998; Swain & Lapkin, 2001). Despite its development from communicative language teaching (CLT), the major goals of TBLT are not solely to promote learners’ spontaneous and meaningful interaction in diverse contexts but also to shift their attention to formal aspects of the spoken language (Celce-Murcia, Dornyei, & Thurrell, 1997, p. 149).

Cognitive information processing approaches to TBLT, upon which this study is based, have investigated the effects of diverse task design factors identified such as task complexity or planning on several aspects of L2 spoken performance, i.e., complexity, accuracy, and fluency (CAF) (Ellis, 2005, 2009; Robinson, 2001a, 2001b, 2003a, 2005a, 2007a, 2007b; Skehan, 1996, 1998, 2001, 2003; Skehan & Foster, 1997, 1999, 2001). Researchers within this approach of
TBLT have the similar goal of cognitively manipulating tasks in a principled way that would lead to a balanced development of meaning and form in the learners’ L2 interlanguage system. However, the researchers in this field make different claims about the manner of manipulating tasks and competing predictions on the effects of the manipulation on CAF.

Based on the Limited Attentional Capacity Model, which claims that the efficiency with which tasks are tackled decreases as the number of tasks being handled increases due to limits to human information processing capacity, Skehan (1998, 2001, 2003, 2009) proposed the Trade-off Hypothesis, in which learners cannot attend to all aspects of the L2 language (such as a trade-off between complexity and accuracy)—particularly when performing cognitively more challenging tasks. In contrast, Robinson’s (2001a, 2001b, 2003a, 2005a, 2011) Cognition Hypothesis is theoretically predicated on the Multiple Resource Capacity in which Robinson claimed that performing diverse tasks does not automatically lead to a decrease in efficiency of the performance as long as these tasks draw on different pools of attention\(^1\). Robinson put forward the Cognition Hypothesis, one of whose main claims is that increasing demands on conceptualizing the message to convey (i.e., more exacting tasks) triggers sophisticated syntactic and lexical processing as well as more accurate delivery of the message with a slight decrease in fluency—therefore simultaneous increase in accuracy and complexity is achievable (2001a, 2001b, 2003a).

\(^1\) Robinson stated that there are three separate resource pools: processing stages, modality, and codes of processing (2001a, 2001b, 2003a) following Wickens (1980, 1981).
A number of studies under either of these two contradicting frameworks have been undertaken on the task complexity and planning, the two independent variables of this study (Ishikawa, 2006, 2008; Kormos, 2006, 2011a, 2011b; Kuiken & Vedder, 2007a, 2007b, 2008; Revesz, 2009, 2011; Robinson, 2001b, 2005a, 2007a, 2007b, 2011; Skehan, 1996, 1998, 2001, 2009 for task complexity; Ahamadian, 2012; Ellis, 1987, 2005, 2009; Foster & Skehan, 1996; Yuan & Ellis 2003 for planning) with very few studies based on two models together (Iwashita, MacNamara, & Elder, 2001). Nevertheless, the manner of controlling the complexity of tasks is not conclusive with conflicting findings in task complexity and planning research.

The findings of the previous studies have been used to support or disapprove either of the frameworks. Researchers explored a more stable and persuasive model of task complexity and planning, based upon the fluctuation of the CAF in learners’ productions performing cognitively loaded tasks.

One of the ways to fill missing gaps in these areas, this study proposes, involves reconsideration of the two models suggested by Skehan and Robinson. As an attempt to assure that learners attend to form as well as meaning, Skehan (1998) and Robinson (2001a) have conflicting approaches presumably due to different focuses, driven by separate psychological foundations being employed: Skehan’s focus on assuring enough attentional resources vs. Robinson’s focus on directing learners’ purportedly dominant attention on meaning toward form. Skehan emphasized the significance of making a task less challenging as complicated tasks take up the majority of attentional resources with less remaining
resources that can be allocated to form while Robinson viewed exacting tasks as essential for increasing functional/communicative demands that would lead to a rise of attention to form. Both of these two aspects (i.e., attentional resources and directing attention), are arguably vital in improving learners’ performance scores, whose complementariness can be observed through simultaneously controlling resource-directing variables and resource-dispersing variables in Robinson’s Triadic Componential Framework (TCF)².

Despite its pedagogical and theoretical significance (Kormos, 2011a; Robinson, 2001a), very few studies have dealt with the joint effects of resource-directing and resource-dispersing variables (Alavi, 2012; Gilabert, 2005, 2007; Kim, 2016; Ong & Zhang, 2010). Additionally, there are several methodological issues in this line of research to investigate the interaction of task complexity and planning on L2 oral performance: different channels of the language (Kim, 2016; Ong & Zhang, 2010 for written productions), exclusion of some parts of CAF (Alavi, 2012; Kim, 2016) and statistical analyses used (Gilabert, 2007).

Since Ortega (1999) pointed out that planning process of the learners must be investigated to account for the mixed results in planning studies, several researchers have observed how learners used their planning time (Guara-Tavares,

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² Task complexity in Robinson’s Triadic Componential Framework (TCF)—“an attempt to provide” an operational taxonomy of “task characteristics that can be used by task and syllabus designers, to classify and sequence a ‘progression’ of pedagogic tasks increasing in complexity (Robinson, 2011, p. 12)”—is further divided into resource-directing and dispersing dimensions, each with different demands on learners: resource-directing variables making cognitive/conceptual demands vs. resource-dispersing variables making performative/procedural demands. Particularly, resource-directing variables direct learners’ attention to form. More in-depth explanations on these dimensions in the TCF are presented in the next chapter.
2008; Kawauchi, 2005; Sangarun, 2005; Tajima, 2003) and identified individual differences as potential factors to influence planning process. They also discovered learners’ tendency to employ temporal advantage for conceptualizing the message to convey rather than encoding the message linguistically.

Nevertheless, there is a lack of study, to date, delving into the planning processes between complex vs. simple tasks. This is critical in order to comprehend the possible changes in the planning processes learners undergo between tasks differing in cognitive complexity manipulated through resource-directing variables (i.e., task complexity in this study). In other words, the results would present learners’ predisposition and the feasibility of *shifting* their preoccupation to the desirable aspects of the language specific to the pedagogic aims, particularly formal aspects of the language, given the potential of resource-directing variables to channel learners’ attention to formal aspects.

1.2 Definition of Terms

*Task complexity:* Following Robinson (2001b), task complexity is operationally defined as “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). In this study, *task complexity* is controlled by +/-here-and-now in the resource-directing dimension; that is, simple conditions are manipulated by +here-and-now while complex conditions are manipulated by –
here-and-now\(^3\).

*Planning:* +/-planning time is one of the resource-dispersing variables that make performative demands on oral performance. In the current study, *planning* is controlled by strategic planning which is operationally defined as “planning what content to express and what language to use but without the opportunity to rehearse the complete task” (p. 474) following Ellis’ (2009) definition.

**1.3 Research Questions**

The focus of the present study is to investigate the interaction effects of manipulating task complexity through resource-directing (controlled by +/-here-and-now – henceforth task complexity for short) and resource-dispersing dimensions (controlled by strategic planning – planning for short). The two variables have been extensively researched in isolation but not in consort (Gilabert, 2007). Another motivation behind the present research is to examine two purportedly irreconcilable attentional models from which different predictions are derived as to the effects of manipulating the cognitive burden. Lastly, this study aims to explore planning processes in tasks differing in task complexity. This study, therefore, seeks to answer the following research questions:

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\(^3\) In the +here-and-now tasks, learners are required to retell the stories that are happening ‘here’ and ‘now’ in the present tense while looking at the picture sets whereas in the –here-and-now (or there-and-then) tasks, they are told to describe the stories that happened in the past without viewing the pictures.
questions:

1. How does task complexity and planning affect the complexity, accuracy and fluency (CAF) of Korean EFL learners?

2. How does task complexity affect planning processes?

1.4 Organization of the Thesis

The present study consists of six chapters. Chapter 1 introduces the purpose of the study and presents the two general research questions. Chapter 2 provides an overview of the literature review relevant to the current study. Chapter 3 describes the methodology employed in the study. In Chapter 4, analyses of the data gathered from the experiment and discussions for each research question relating the results are presented. Finally, Chapter 5 concludes the research with a summary of the significant findings, pedagogical implications, limitations and suggestions for further research.
CHAPTER 2.
LITERATURE REVIEW

This chapter presents the literature review relevant to the focus of the current thesis—the effects of task complexity and planning. Section 2.1 discusses conceptual and theoretical background in the exploration of manipulating the complexity of L2 oral tasks. Section 2.2 deals with psychological speech production models, which are theoretical frameworks for task complexity and planning—the IVs of the study. Section 2.3 reviews Skehan’s (1998) and Robinson’s (2001a) frameworks, upon which a number of studies in task manipulation were based, along with previous studies based on these two models.

2.1 Focus on Form in Task-based Language Teaching

According to Skehan and Foster (2011), language operates in spite of the imperfection in its functional systems (Skehan & Foster, 2011), through contextual and discourse knowledge (Anderson & Lynch, 1988), and a series of communicative strategies (Kasper & Kellerman, 1997) for extracting meaning.

A number of studies (Corder, 1973; Harley, Allen, Cummins & Swain 1990; Schmidt & Frota, 1986; Schumann, 1978; Selinker, 1972; Swain & Lapkin, 1982, for assessing Canadian Immersion program) indicate that redundancy inherent in syntactic aspects of language has been warning signs for exclusive focus on meaning. As learners tend to focus on meaning, left to their own devices (VanPatten, 1990), the issue of channeling learners’ attention to formal aspects
(e.g., complexity and accuracy) has been extensively discussed (Robinson, 2001ab, 2003a, 2005a, 2007ab; Skehan, 1996, 1998, 2001, 2003).

Several approaches to task-based language teaching (TBLT) aimed to design syllabus with “a focus on meaning with a timely focus on linguistic forms consistent with the learners’ internal syllabus” (Révész, 2009, p. 438), through balancing the tension between communication-driven approaches (e.g., Long, 1988) and structure-oriented approaches⁴ (e.g., Fotos & Ellis, 1991; Loschky & Bley-Vroman, 1993): communication-driven approaches subject to fossilization and slower progress (Long, 1988) due to lack of consideration in the role of formal aspects and structure-oriented approaches criticized by its artificiality (Skehan, 1998).

Cognitive information processing approaches to TBLT (Ellis, 2005, 2009; Robinson, 2001ab, 2003ab, 2005a, 2007ab, 2011; Skehan, 1996, 1998, 2001, 2003; Skehan & Foster, 1997, 1999, 2001), which the current thesis is based on, stem from learners’ cognitive processing and allocation of attention while engaging in tasks (Kuiken & Vedder, 2007a). This line of research led to identification of various task design factors (e.g., task complexity and difficulty) through which syllabus designers can manipulate tasks, with the widening knowledge of cognitive processes and attentional allocation (Foster & Skehan, 1996; Robinson, 2001a; Skehan, 1998).

Task complexity and task difficulty have been the focus of investigating task

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⁴ Structure-oriented approaches put a great emphasis on formal linguistic aspects to the detriment of meaning (Skehan, 1998).
design factors given their “selective-channeling rationale for tasks” (Skehan 1998, p. 97), which emphasizes the significance of linking desirable aspects in L2 performance with design factors influencing the performance (Kim, 2016). Conflicting projections made by Skehan and Robinson of the effects of task complexity or difficulty on spoken productions in terms of complexity, accuracy and fluency (CAF) triggered discussions as to which model is more stable and consistent to guide syllabus designs. However, mixed findings in task complexity and difficulty have rendered the debate inconclusive (Gilabert, 2007)⁵.

2.2 Psycholinguistic Speech Production Models

The most cited and influential models of psycholinguistic language production are Levelt’s (1989) for native speakers and de Bot’s (1992) for bilinguals. These models provided theoretical foundation to account for the effects of manipulated tasks on CAF, regarding differential attentional allocation to different stages of speech production (Kim, 2016).

Levelt (1989) distinguished three essential components comprising of language production: first, language users plan messages to convey and monitor the whole process of their utterances before and after actual speaking in conceptualizer; second, the preverbal messages undergo linguistic encoding process in terms of syntactic, lexical, and phonological aspects in formulator; and

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⁵ For a more in-depth review on the findings in task complexity and planning, see Section 2.3.2.
third, the information obtained from the previous stages is transferred to *articulator* in charge of actual utterances.

As the systems of *formulator* and *articulator* have been automatized (Levelt, 1989), L1 users pay the majority of their attention to plan and monitor their messages in *conceptualizer*. *Conceptualization* and *monitoring* in *conceptualizer* operate under ‘controlled processing,’ which means conscious attention has to be paid to conceptualization and monitoring. Therefore, tasks inducing complex concepts, which require a number of attentional resources to conceptualization with lower availability in monitoring their utterances, are likely to result in a decrease in accuracy or slower production; on the other hand, lexical and syntactic complexity—operating under automatic processing—do not decrease with increasing conceptual demands (Levelt, 1989).

Another speech production model was proposed by de Bot (1992) specifically designed for explaining L2 speech production with some revisions to Levelt’s (1989) based on the observation of noticeable differences in language production between L1 and L2: L2 learners’ unique characteristics such as cross-linguistic influences and limited proficiency (Kormos, 2006, 2011b). Without the fundamental difference in stages of processing—*conceptualizer*, *formulator*, and *articulator*—one of the major contrasts lies in the differential allocation of attention in which *formulator* and *articulator* require explicit attention as well as *conceptualizer* in L2 processing. Therefore, learners, particularly with limited proficiency, must decide to which aspects they will pay attention, “prioritizing content over form, lexis, or grammar, or vice versa” (Kormos, 2006, p. 173).
Kormos (2011) emphasized the significance of linking task-based language teaching (TBLT) studies with the psycholinguistic speech production models (e.g., considering psycholinguistic mechanisms being involved in carrying out tasks). Particularly, Kormos gave validity to claims of Robinson’s Cognition Hypothesis relying on psycholinguistics of speech processing; that is, Kormos (2011) demonstrated how increasing task complexity through resource-directing variables can enhance L2 development “through the extension of the L2 conceptual system, which in turn triggers lexical, syntactic, and morphological development by driving learners to make new form-meaning connections” (p. 39). In the same vein, research in task complexity and planning (e.g., Robinson, 2001; Skehan, 1998) is fundamentally predicated on the well-established psycholinguistic speech production models (Kormos, 2006; Levelt, 1989, 1999), supporting relevant hypotheses and claims (e.g., Skehan’s Trade-off Hypothesis).

2.3 Task Complexity

Research in task complexity and task difficulty—the most discussed task features in the literature—proposed by Robinson (2001a) and Skehan (1998) was motivated by the shared interest of how learners allocate their attention and of manipulating tasks (Robinson, 2001a, 2001b). Nevertheless, these two scholars formulated competing hypotheses regarding the effects of manipulating tasks on

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6 Task complexity here is an encompassing term referring to one of the design factors including task complexity, task difficulty, planning, etc.
2.3.1 Two Theoretical Frameworks of Information Processing Models

A major difference between Robinson’s and Skehan’s frameworks, among other things, is the different psychological foundation employed, based upon which various differing claims were made.

2.3.1.1 Skehan’s Limited Attentional Capacity Model

Skehan advanced the Trade-off Hypothesis (2001), which states that L2 learners cannot attend to every aspect of CAF simultaneously when performing more difficult tasks. For example, insufficient time given for task completion would pressure learners to select some aspects of CAF, and therefore they may give heed to fluency in some tasks, whereas they may prioritize more complex and accurate performance in others.

Skehan developed the Trade-off Hypothesis and arguments theoretically based on Limited Attentional Capacity Model (1998, 2001, 2003, 2009) in which more challenging tasks “consume more attentional resources simply for transaction, with the result that less attention is available for focus on form” due to limited resources in humans’ attention (Skehan, 1998, p. 97). This is because learners tend to be preoccupied with meaning (VanPatten, 1990, 1996; Schmidt, 1990), which implies that when engaging in cognitively loaded tasks, learners with limited proficiency take up too much of their attention in meaning with the
consequential decrease in remaining resources that can be allocated to forms (Schmidt, 1990).

In order for focus on form to occur for second language learners, noticing must be “contrived” in a certain way (Skehan, 1998, p. 152). Demanding tasks may lower the occurrence rate of noticing as a consequence of overloading the limited capacity system (Schmidt, 1990). Skehan (1998) stated “if the appropriate level of task difficulty is chosen, there is much greater likelihood that noticing will occur, that balanced language performance will result, and that spare attentional capacity can be channeled effectively” (p. 134).

Skehan (1997) put forward recommendations that tasks be chosen of an ‘appropriate level of task complexity,’ as affected by the three identified elements: code complexity, cognitive complexity and communicative stress. Each element deals with linguistic, cognitive, and performative demands of task respectively. Task designers and teachers can employ these task design items with which to manipulate tasks in such a manner that tasks can “orient learners away from simply focusing on meaning, but also push them to extending and at the same time achieving greater control over the language” (Skehan, 2002, p. 293).

Under Skehan’s framework, planning in communicative stress factor—the focus of this thesis—has been extensively studied (Crookes, 1989; Ellis & Yuan, 2004; Guara-Tavares, 2008; Skehan & Foster, 1997) as a compensating factor to limited capacity of attention with the potential to positively influence CAF, although the trade-off between accuracy and complexity has been frequently reported in studies—this component will be reviewed in greater detail in Section
2.3.1.2 Robinson’s Multiple Resource Capacity Model

Robinson (2001a, 2001b, 2003a, 2005a, 2007, 2011) shared a view with Skehan (1998, 2001, 2003, 2009) that Focus on Form (FonF) is closely associated with the degree to which attentional resources are allocated to conceptualizing the message to convey. However, Robinson (2011) held that exacting tasks require the heightened effort in conceptualizing more complicated concepts, and these intricacies bring about sophisticated syntactic encoding processing to express the complex pre-verbal message constructed in conceptualizer, which is contrary to Skehan’s Trade-off Hypothesis.

Robinson (2001a, 2001b, 2003a, 2005a, 2007, 2011) states that the complexity of tasks is determined by three design factors: Task Complexity (the cognitive complexity inherent in tasks), Task Condition (interactive factors) and Task Difficulty (concerned with learner factors including affective and proficiency variables) as illustrated in his Triadic Componential Framework (TCF)—“an attempt to provide” an operational taxonomy of “task characteristics that can be used by task and syllabus designers, to classify and sequence a ‘progression’ of pedagogic tasks increasing in complexity” (Robinson, 2011, p. 12).

Even though Robinson acknowledges the role of Task Condition and Difficulty on on-line or extemporaneous decision making in actual implementation of tasks in classrooms, he proposed that Task Complexity, the
cognitive demands inherent in tasks, be the sole factor in making a ‘priori’ sequencing decisions (2001a) given the stability and consistency with which Task Complexity affects learner performance.

Robinson (2003a) further distinguished between resource-directing and resource-dispersing variables in Task Complexity. Increasing the complexity of tasks through resource-directing dimensions demands more cognitive resources on the part of the learner with the potential for directing learners’ resources to linguistic aspects relevant to the task simultaneously. Resource-directing dimensions include here-and-now/there-and-then, few/many elements, and with/without reasoning. For example, making a task more challenging by –here-and-now or there-and-then (i.e., learners are required to talk about what happened in the past), the task requires greater effort at conceptualization and needs greater demands of memory, which directs learners’ resources to using past tense to retelling stories having occurred in the past, compared with events happening in the present in a shared context in the case of +here-and-now. In other words, -here-and-now (or there-and-then) tasks are cognitively and conceptually more demanding rather than here-and-now in terms of resource-directing variables.

In the Cognition Hypothesis (Robinson, 2003b) based on SLA theory, functional and cognitive linguists (Givon, 1995, 2009; Tomasello, 2003), and developmental psychology (Cromer, 1991; Slobin, 1993), more complex tasks through resource-directing dimensions will impel L2 speakers to produce more complex and accurate language concurrently to “meet the consequently greater functional/communicative demands” (Robinson, 2011, p. 18) by adapting
Multiple Resource Capacity Model (Navon & Gopher, 1980; Wickens, 1989), which proposes that there are multiple resources of attention and accordingly, competition for attentional resources is not unavoidable in more complex tasks.

Speech production models (de Bot, 1992; Kormos, 2006, 2011b; Levelt, 1989) were employed to strengthen the link between greater cognitive complexity of tasks and the concurrent increase in accuracy and complexity. Complexity in preverbal message in conceptualizer is forwarded to formulator to encode the intricate concepts linguistically (Levelt, 1989). In other words, complicated concepts trigger enhancement in L2 syntactic and lexical performance as they have a tendency to “call on more sophisticated vocabulary and intricate relations among concepts, and these intricate relations among concepts will activate more complex syntactic encoding procedures” (Kormos, 2011a, p. 53). In the process, the intricacy of the content induces greater attention to the language production, triggering higher accuracy (Loschky & Bley-Vroman, 1993; Robinson, 2001a; Tarone & Parrish, 1988) through more frequent activation of monitoring system implemented to examine the processing of language production (Kormos, 2011a; Levelt, 1997).

On the other hand, resource-dispersing dimensions in the Task Complexity factor in TCF do not direct attentional resources to linguistic coding; increasing complexity in these dimensions disperses L2 learners’ attention to various non-linguistic aspects as well as linguistic ones (Robinson, 2003b). Resource-dispersing dimensions include with/without planning time, with/without prior knowledge, and single/dual task elements. For example, making a task more
performatively complex in these dimensions (e.g., no planning time) has an imperceptible impact on noticing of linguistic encoding or L2 interlanguage (IL) development of form-function relationships (Robinson, 2011). While no significant association between enhanced performance in formal aspects and performatively complex tasks is made (Robinson, 2003a), planning, for instance, in resource-dispersing dimensions can positively influence fluency of L2 learners’ interlanguage (Robinson, 2001a).

2.3.2 Previous Studies in Task Complexity and Planning

This section reviews previous studies in task complexity and planning in Sections 2.3.2.1 and 2.3.2.2 respectively.

2.3.2.1 Previous Studies in Task Complexity

Various studies have been conducted investigating the effects of manipulating task design characteristics in Skehan’s and Robinson’s frameworks on L2 oral performance, specifically CAF (e.g., Foster & Skehan, 1996; Foster and Tavakoli, 2009; Skehan & Foster, 1997; Tavakoli & Skehan, 2005 under Skehan’s framework, Gilabert, 2007; Gilabert, Baron & Levkina, 2011; Ishikawa, 2008; Michel, Kuiken & Vedder, 2012; Rahimpour, 1997; Robinson, 1995, 2001b under Robinson’s framework).

Previous studies in task complexity within the Limited Attentional Capacity Model mainly focused on task types and planning in cognitive complexity and
communicative stress in Skehan’s distinction of task difficulty (1998). General findings support this psychological model of attention as well as the Trade-off Hypothesis—specifically between oral complexity and accuracy. For example, the interlanguage (IL) of learners engaging in more demanding version of tasks (e.g., one vs. two storylines to describe in Foster & Tavakoli, 2009) was significantly more complex although not always accurate. Other studies (Skehan & Foster, 1997; Tavakoli & Skehan, 2005) also reported the trade-off relationship between complexity and accuracy.

Other researchers (e.g., Michel, Kuiken & Vedder, 2012), basing their theoretical foundation on the Multiple Attentional Capacity Model, investigated the effects of task complexity—controlled through resource-directing variables (e.g., +/-here-and-now in Robinson, 1995, +/-reasoning in Ishikawa, 2008 and +/-elements in Robinson, 2001b)—on L2 spoken performance, CAF. Robinson’s Cognition Hypothesis has not been fully supported by the findings in this line of research. For example, Robinson (1995) manipulated task complexity through +/-here-and-now variable in which L2 learners were asked to retell picture-cued narratives in the present tense while looking at the pictures in the simpler +here-and-now task, whereas they were not allowed to view the pictures while describing the narratives in the past tense in the more complex here-and-now task. The results showed that complex tasks induced lexically more complex language with a strong trend of higher accuracy and lower fluency without any statistical significance in terms of syntactic complexity. Reported findings were analogous in other studies (Gilabert, 2007; Gilabert, Baron & Levkina, 2011; Michel, Kuiken
& Vedder, 2012; Rahimpour, 1997; Robinson, 2001b) concerned with task manipulation within Robinson’s framework and Multiple Attentional Capacity Model. The findings of the majority of the studies on task complexity were in conflict with the Cognition Hypothesis.

Nevertheless, a couple of studies advocated the Cognition Hypothesis. In Ishikawa’s (2008) study, there were three versions of tasks differing in complexity: no reasoning, simple reasoning, and complex reasoning, with varying numbers of relationships which must be described. According to the results, no reasoning task, the simplest condition, induced greater fluency than the other tasks. The learners’ spoken performance in the simple reasoning task was more lexically and syntactically complex and more accurate than no reasoning task. However, no increase in oral complexity was found in complex reasoning task. Similarly, in Kim’s (2016) study, simultaneous increase in syntactic complexity and accuracy was observed in advanced learners’ written performance under a more complex task manipulated through +/-here-and-now although this concurrent enhancement of complexity and accuracy was not found in intermediate-level learners who produced more accurate IL but not complex, which is in line with Skehan’s Trade-off Hypothesis.

It is noteworthy that in both studies learners performing cognitively more demanding tasks improved their performance in complexity and accuracy in such a condition that they likely had enough attentional resources given the task difficulty in Ishikawa (2008) or higher proficiency in Kim (2016). For example, in Ishikawa’s (2008) study, he varied the degree of complexity rather than a
dichotomy of plus or minus specific dimensions (e.g., +/-reasoning). The findings showed learners’ oral complexity and accuracy improved solely in simpler reasoning task which suggests the possibility that failures of simultaneous increase in complexity and accuracy observed in previous studies could have been attributable to overly challenging tasks chosen for learners, when simple reasoning tasks might have been demanding enough and directed learners’ attentional resources to desirable aspects (as shown in Ishikawa’s).

The specific issues mentioned above combined with the possibility of a more dynamic interaction between resource-directing and resource-dispersing dimensions opens up the potential of the interaction between +/-here-and-now, for instance, in resource-directing dimensions and planning in resource-dispersing dimensions as a complement to the higher attentional resources required for complex tasks for learners with limited proficiency.

It was indeed pointed out that research was needed on the interaction effects of resource-directing and dispersing dimensions (Kormos, 2011a; Robinson, 2001a;) as “planning time is unlikely to have its effects on learners’ attempts to produce the L2 independently of other dimensions of the cognitive demands of tasks which they are engaged in planning to perform” (Robinson, 2011, p. 21).

Nonetheless, studies in combined effects of the two dimensions are sparse. To date, there remain methodological issues to investigate the interaction of task complexity and planning on L2 oral performance: a) different channels of the L2 (Kim, 2016; Ong & Zhang, 2010 for written productions), b) exclusion of some parts of CAF (Alavi, 2012; Kim, 2016) and c) statistical analyses used (Gilabert,
Gilabert (2007) did not separate individual effects of the two independent variables from interaction effects, employing one-way ANOVA.

### 2.3.2.2 Previous Studies in Planning

Planning studies were inspired by early findings of beneficial effects of planned speech versus non-planned speech on spoken language (Ochs, 1979). The majority of planning studies have focused on strategic planning among various types of planning thenceforth.

Ellis (2005) differentiated two types of planning used in TBLT: pre-task planning and within-task planning (otherwise known as on-line planning). These two types of planning differ in the phase when planning time is given. Pre-task planning occurs before the task is performed and entails learners’ preparation for the content they need to perform the task and how the content is delivered. Further division in pre-task planning was made between rehearsal and strategic planning—rehearsal defined as “planning” that “takes the form of an opportunity to perform the complete task once before performing it a second time” and strategic planning defined as “planning what content to express and what language to use but without the opportunity to rehearse the complete task” (Ellis, 2009, p. 474). Online planning, on the other hand, occurs while learners perform the task, and it is further divided into pressured and unpressured planning depending on whether planning time is limited.

Planning research is theoretically rooted in speech production models (Levelt,
1989, 1999 for L1; Kormos, 2006 for L2). Strategic planning aids conceptualization which leads to complicated concepts and enhanced fluency; when learners are provided with strategic planning, they allocate their attention to conceptualizing their messages more than encoding linguistic plans (Ellis, 2005). This view is congruent with VanPatten’s input processing model (1990) in which learners process meaning before form due to their limited information capacity.

Even when they were instructed or guided to draw form-focused planning, learners prefer to use the given time for organizing ideas and working out the semantic linkages (Ellis, 2005, 2008). For example, Foster and Skehan (1996) studied the effects of pre-task planning under three different conditions—no planning, unguided pre-task planning and guided pre-task planning—and three tasks—personal information, narrative, and decision-making. The findings showed that learners’ accurate performance was not significantly influenced by the instruction on focusing their attention to form during planning.

Most of the planning studies have been undertaken within Skehan’s Limited Attentional Resource Capacity Model, supporting his framework with the findings in which trade-off effects have been widely observed (Crookes, 1989; Ellis & Yuan, 2004; Guara-Tavares, 2008; Skehan & Foster, 1997). Skehan (1996) stated that humans’ limited processing capacity prohibits L2 learners from attending to every aspect of spoken language, producing trade-off effects between meaning and form, or syntactic complexity and accuracy. Wendel (1997), for example, asked learners with low-intermediate to intermediate proficiency to describe the storyline after watching a video under 1) no planning or 2) strategic
planning condition. Planned tasks promoted complexity and fluency while they failed to influence accuracy significantly. The seesaw effects between complexity and accuracy were reported by subsequent studies (Ellis & Yuan, 2004; Guara-Tavares, 2008).

There are, however, several anomalies in these general findings in planning research: improved fluency (Foster, 1996; Gilabert, 2007), greater complexity and accuracy (Guara-Tavares, 2008), higher CAF (Ortega, 1999; Tavakoli & Skehan, 2005). Individual differences, Ortega (1999) believed, may explain these differing, sometimes contradictory findings, followed by the exploration of planning process (Guara-Tavares, 2008; Kawauchi, 2005; Sangarun, 2005; Tajima, 2003). The general findings of these studies provided researchers with a clearer understanding of the manner in which learners utilize planning time: First, planning is subject to individual differences including the attitudes toward planning and the orientation toward meaning conveyance versus accurate delivery; and second, when given planning time, learners prefer to utilize the temporal advantage to formulate a conceptual plan of the message in lieu of encoding it linguistically.

To date, there is a shortage of research in effects of task complexity on planning process. In addition to the investigation of planning processes, there needs to be research in planning process under combined conditions of planning and task complexity factors to look into the possible changes in the planning process between tasks differing in cognitive complexity manipulated through resource-directing variables.
2.3.3 Two Theoretical Frameworks Revisited

Skehan and Robinson had a similar goal of manipulating tasks in such a well-grounded way that FonF occurs consistently and predictably. They employed different approaches based upon which different arguments were established.

Previous studies in task complexity and strategic planning have proved or disproved either of these two models based on fluctuations in CAF, in search of a model with more predictive power. However, critical review of Skehan’s and Robinson’s models revealed the potential complementarity of these two frameworks, which may explain mixed findings in the previous studies in task complexity and planning.

2.3.3.1 Skehan’s Limited Attentional Capacity Model Revisited

This section discusses Skehan’s Limited Attentional Capacity Model (1998, 2001, 2003, 2009) focusing on the point of interpreting failure of FonF.

Based on the belief that humans’ limited information processing capacity is the major reason that learners fail to attend to every aspect of L2 spoken performance, Skehan (1998) proposed that tasks of appropriate level of difficulty be chosen because cognitively loaded tasks “consume more attentional resources…., with the result that less attention is available for focus on form” (p. 97). However, the application of the reverse—simpler tasks, which do not demand many attentional resources, automatically lead to FonF, specifically, focus on
accuracy—is controversial.

A counterargument to the assumption that limited capacity is the sole obstacle to FonF is the natural predisposition towards meaning commonly found in L2 learners (Doughty, 1991; Fotos and Ellis; 1991; Fotos, 1993; Skehan & Foster, 2001; VanPatten, 1990). Skehan and Foster (2001), for example, argued that syntactic redundancy in language might drive learners to neglect FonF even with adequate attentional resources because FonF is not “sufficiently motivated” (p. 187). Furthermore, although the effects of planning on fluency have been consistent, a trade-off relationship between formal aspects, i.e., complexity and accuracy, remains. This implies that providing attentional resources might not assure that focus on form, particularly on accuracy, occurs.

In Mehnert’s (1998) study, the participants were provided with varying planning time of 1, 5, and 10 minutes. The results showed that complexity, lexical density, and fluency were highest in 10 minutes planning but no significant difference in accuracy was found between 1 and 10 minutes planning time. This implies that providing more time to plan—allowing more attentional resources—does not automatically lead to focus on accuracy.

A possible explanation for mixed results in terms of focus on accuracy is individual differences. Studies in planning process showed that learners’ attitude towards planning and orientation in L2 speaking have a seismic effect on whether they can benefit from planning time (Ortega, 1999; Sangarun, 2005; Tajima, 2003), which decreases the predictive power of Skehan’s model accordingly.
2.3.3.2 Robinson’s Multiple Resource Capacity Model Revisited

The current section revisits Robinson’s Multiple Resource Capacity Model (2001a, 2001b, 2003a, 2005a, 2007, 2011), dealing with two major points of perfect time sharing in Multiple Attentional Model and of the linkage between directing attention and improved performance in terms of formal aspects.

Robinson states that ‘directing’ learners’ attention towards formal aspects is crucial to the simultaneous development of oral complexity and accuracy, through manipulating task complexity along resource-directing dimensions (such as +/- here-and-now). This was theoretically based on Multiple Resource Capacity Model (Navon & Gopher, 1979; Wickens, 1980), which implies that the performance of more than one task will efficiently share time as long as these tasks demand separate resources (Wickens, 1981); in other words, the efficiency of performing more than one task will be as high as that of handling one task at a time.

There is a debatable assumption behind Robinson’s claims: separate resources are employed in oral complexity and accuracy and therefore, a concurrent increase is possible in these two aspects.

The first element for review is perfect time sharing in Multiple Attentional Model. Wickens (1981) stated that “perfect time-sharing results when the two tasks demand entirely non-overlapping sets of resources;” (p. 17) and “it is dubious that “perfect” time-sharing will ever be achieved (or objectively measurable) outside of the idealized laboratory conditions” (p. 31) with
implications that interference will occur in performing diverse tasks employing even partially overlapping resources.

The assumption—separate resources employed in oral complexity and accuracy—has yet to receive enough attention, leaving the concept of a resource pool loosely defined (Gilabert, 2007). For example, cases of efficient time sharing in cognitive psychology are fairly obvious and intuitive: driving and singing drawing on ‘manual’ and ‘vocal’ resource pools with no competition for attention. On the other hand, the issue of whether the resource pool drawn by oral complexity and the one drawn by oral accuracy are ‘entirely non-overlapping’ is less clear. In addition, the nature of complexity and accuracy dimensions is in need of clarification, regarding whether to view them as “two dimensions of a single task (i.e., speaking) that draw on a single pool of resources and therefore compete” for attention or as two tasks employing different resource pools (Gilabert, 2007, p. 65).

Even researchers in Multiple Resource Capacity models, however, such as Kormos (2000), drawing on Wickens’ (1989) model, have argued that diverse dimensions of spoken language employ the same resource pool: “upon processing their speech, L2 learners need to rely on the same verbal resource pool; therefore the various phases of speech production need to compete with each other for attentional resources” (p. 348).

Another notable point in the discussion drawing on these psychological models is the fact that Multiple Attentional capacity model as well as Limited Attentional Capacity model are part of Capacity models, subject to attentional
capacity which is limited. Wickens argued that there are not major differences between these two models after careful review; both of the models explain the differential efficiency with which time-sharing can occur and account for the decreasing efficiency in tasks drawing on similar structures (1991). Thus the limits of such capacity (Gilabert, 2007) and the independent and joint demands of oral complexity and accuracy specific to different tasks must be identified. However, few attempts have been made to estimate capacity limitations and joint demands of these aspects. Therefore, without preceding comprehension of types and amount of resources drawn by linguistic forms, interpretations exclusively relying on fluctuation of CAF have tended to be overly simplified.

The second element reviewed in this section is the relation between directing attentional resources to formal aspects and improved performance in these aspects. A number of task complexity studies in task complexity and strategic planning have tended to directly associate variation in CAF with psychological process. This assumes that directing naturally leads to improvement in performance scores. If there is an increase in accuracy under certain conditions, for example, vis-à-vis other conditions, it could be argued that learners’ attention was directed to the specific part. However, the legitimacy of the reverse—directing attention to accuracy leads to increase in accuracy—is disputable. A distinction may be made between ‘direction’—cognitive psychological process—and ‘increase’ in CAF—observed performance scores, as improved performance in certain areas is arguably a function of directing attentional resources and enough attentional capacity to accomplish a goal (as well as other factors). In other words, directing
might not necessarily lead to an increase in the directed aspect(s), presumably because of the limits of 1) linguistic resources or 2) attentional resources. Even though learners’ attention is direct{ed} to formal linguistic aspects, inadequate linguistic resources, such as deficient declarative knowledge of syntax, grammar or lexis, may restrict increase in these aspects (Ortega, 1999). This may explain mixed results concerning accuracy in planning studies employing target language norms to assess L2 spoken accuracy.

On the other hand, it was argued that learners engaging in cognitively loaded tasks are pushed to produce more complex and accurate language, or direct{ed} to complexity and accuracy during their performance, in order to meet the functional demands (Robinson, 2001a). However, if they lack attentional resources sufficient to complete the task, this will not necessarily lead to increase (see Ishikawa, 2008; Kim, 2016).

2.3.3.3 Summary

Skehan and Robinson proposed a framework, focusing on assuring enough attentional resources on one hand, and directing on the other. Little attempt has been made to consider the potential of the two models to account for different aspects of L2 production. Even though both Skehan’s and Robinson’s models acknowledge the role of individual differences on L2 performance (Ellis, 2009), it seems that Skehan’s framework is more subject to individual differences such as propensity for meaning or risk-tasking, or attitudes toward planning time, as he noted “pedagogic
decisions, if they are not to compromise naturalness of communication, can only be probabilistic in nature” (Skehan, 1998, p. 152).

Researchers (Alavi, 2012; Gilabert, 2005, 2007; Kim, 2016; Kormos, 2011; Ong & Zhang, 2010; Robinson, 2001a) postulate the potential of the interaction effects of resource-directing (e.g., +/-here-and-now) and dispersing dimensions (e.g., strategic planning) on L2 performance. The simultaneous manipulation of task complexity along these two dimensions has the potential of maximizing learners’ performance, through directing learners’ attention to desirable aspects specific to pedagogical goals (under Robinson’s framework) and providing them with enough attentional resources to achieve the goals (under Skehan’s framework).
CHAPTER 3.
METHODOLOGY

This chapter presents the methods used in this study. Section 3.1 introduces the research design. Section 3.2 discusses the participants. Section 3.3 provides details on the instruments regarding task materials and post-task questionnaire used. The treatment of the four conditions are explained in Section 3.4. The procedures of the study are described in Section 3.5. Section 3.6 describes the data analyses.

3.1 Research Design

The study was conducted with a 2x2 repeated-measures design. The participants completed all of the four tasks under four different conditions with headings—simple no planning (SN), complex no planning (CN), simple planning (SP), and complex planning (CP) (Table 3.1). There were two independent variables: 1) task complexity (+here-and-now [simple] and –here-and-now [complex]) and 2) planning (planning and no planning). Dependent variables were lexical complexity, syntactic complexity, accuracy and fluency.

Table 3.1 Experimental Design of the Study

<table>
<thead>
<tr>
<th>No planning</th>
<th>+here-and-now (simple)</th>
<th>-here-and-now (complex)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SN (n=40)</td>
<td>CN (n=40)</td>
</tr>
<tr>
<td>Planning</td>
<td>SP (n=40)</td>
<td>CP (n=40)</td>
</tr>
</tbody>
</table>
3.2 Participants

Data were collected from sixty-seven 11th grade students from one co-educational boy’s high school in Gumi, Gyeongsangbuk-do, South Korea. All the students have completed eight years of English education in elementary and secondary school. The two classes, which were divided from other classes based on the students’ scores on previous English tests in 10th grade, were chosen. All of their English test scores in 10th grade were over 90 out of 100.

Although their general English proficiency is believed to be not significantly different, the tests used did not measure the participants’ English speaking ability directly. The current study requires intermediate proficiency considering easier comparison among other planning studies employing intermediate learners (e.g. Kawauchi, 2005; Ortega, 1999; Skehan, 2005; Yuan & Ellis, 2003). Another preliminary test was administered to select the participants with intermediate English speaking proficiency for the main tasks. The test consisted of six sample questions open to the public by TOEIC Speaking\(^7\). Some of the questions were edited because of potential problems in background knowledge of the participants. The participants’ scores in the test showed that they had English proficiency of Level 2 to Level 6 according to the TOEIC Speaking score and level description (see Table 3.2)\(^8\). To assure homogeneity of the groups and enough samples for the

\(^7\) One question was used in each section and the scores were also adjusted according to the proportion of the number of the questions used.

\(^8\) The assessment results of TOEIC Speaking are represented as scores ranging from 0 to 200 and levels ranging from 1 to 8.
main study, solely the students with Level 5 (n=40) participated in the main tasks. They can be considered as intermediate low in comparison to the description of low intermediate proficiency in ACTFL guidelines.

The audio-recorded speaking test files were rated by the researcher and one English teacher with over twenty-year experiences of teaching English to elementary to high school students according to the scoring rubric made open by TOEIC Speaking. Half of the samples were rated by both assessors. After confirming the inter-rater reliability (Pearson correlation coefficient: .948), the rest of the samples were rated by the researcher.

<table>
<thead>
<tr>
<th>Level</th>
<th>Score</th>
<th>Level description</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>40~50</td>
<td>Typically, test takers at level 2 cannot state an opinion or support it. They either do not respond to complicated requests or the response is not at all relevant.</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>60~70</td>
<td>Typically, test takers at level 3 can, with some difficulty, state an opinion, but they cannot support the opinion. Any response to a complicated request is severely limited.</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>80~100</td>
<td>Typically, test takers at level 4 are unsuccessful when attempting to explain an opinion or respond to a complicated request. The response may be limited to a single sentence or part of a sentence.</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>110~120</td>
<td>Typically, test takers at level 5 have limited success at expressing an opinion or responding to a complicated request.</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>130~150</td>
<td>Typically, test takers at level 6 are able to create a relevant response when asked to express an opinion or respond to a complicated request.</td>
<td>3</td>
</tr>
</tbody>
</table>

Information regarding the scores and level descriptions can be retrieved from http://exam.ybmnet.co.kr/toeicswt/introduce/result.asp.
3.3 Instruments

This section details the instruments implemented in the study, i.e., picture sets and post-task questionnaires.

3.3.1 Picture sets

Four spoken narrative tasks were assigned to all participants in the orders specified in Section 3.3. All of the four tasks were stories produced in a chronological order of events based on six pictures. Previous studies on oral production tasks validate the use of picture-based narrative tasks given their potential to stretch students’ linguistic resources while performing the task with their interpretation of the photos (Ellis & Yuan, 2004; Skean & Foster, 1999). The line of studies in task complexity/difficulty or planning (Ellis, 1987; Ellis & Yuan, 2004; Ishikawa, 2006; Piri, Barati, & Ketabi, 2012; Yuan, 2001) preferred this type of tasks over others; therefore, using narrative tasks would make the comparison among the studies reliable. Picture-cued narrative tasks are monologic in nature, less subject to interactional variables (Yuan & Ellis, 2003).

To attribute differences in learners’ performance scores (i.e., CAF) in the four tasks to the conditions under which tasks were conducted rather than any inconsistency inherent in the stories, diverse potential factors affecting L2 performances were controlled in a similar fashion under all the tasks; that is, all four tasks involve a story consisting of six pictures happening around school with
similar development of plots, all containing the protagonist’s noticing of the events, reactions, and the consequences. In addition, under the same theme of school, learners’ language is expected to be produced within a certain range of vocabulary. While tasks used for previous studies in task complexity and strategic planning may be socio-culturally unfamiliar to the learners of this study (e.g., Gilarbert, 2007), which therefore may potentially pose a bias against the participants without background knowledge of the certain content areas (Bachman, 1990), the contents of the stories used for the current study are likely familiar to all the students (high school students) and accordingly the possibility of tasks differentially affecting certain group of the learners may be avoided (see Appendix 1). Additionally, one Korean EFL learner with intermediate English speaking proficiency, who is not part of the study, responded that he perceived no discernible differences in the difficulty among the picture sets after completing all the tasks.

3.3.2 Post-task Questionnaires

After completing the tasks under planned conditions, learners were asked to respond to the retrospective questionnaire adapted and revised from Park, 2009 consisting of six\(^{10}\) questions, some of which are in Likert-scale form or open ended ones (see Appendix 2). The questions mainly dealt with degree of attention

\(^{10}\) The questionnaire was originally composed of 7 questions with sub-items. The last question irrelevant to the current study was not used.
towards different aspects of spoken English during the planning time, degree of perceived priority, perceived difficulty, and perceived effectiveness of planning. The comparison of the individual learners’ responses to two separate questionnaires of each planned conditions would show the change of their allotted attention to different aspects, perceived priority, difficulty and effectiveness of planning. The learners were provided with the questionnaires translated into their L1, Korean.

3.4 Treatment

In each condition, the treatments given to the learners differed in the time allowed to plan before speaking (50 seconds/10 minutes) and in the tense required in the description (present/past) with or without an visual aid.

3.4.1 +/-here-and-now condition

In the simple +here-and-now tasks, learners were instructed to view the six series of pictures for the time given differentially depending on the planning conditions and to describe them in the present tense with a visual aid (i.e., viewing the picture sets was allowed during the description). On the other hand, in the complex –here-and-now (or there-and-then) tasks, no visual aid was given to learners after the first time for 50 seconds or 10 minutes to plan their performances and they were instructed to describe the picture sets in the past tense as if they
were retelling the story that had happened in the past. The tense requirement was explicitly written on the monitor screen.

3.4.2 Planning condition

In the planning tasks, the participants were provided with ten minutes of planning time before retelling the picture sets. The ten-minute strategic planning has become the standard and has been used in various planning studies after Mehnert’s (1998) study in which she varied the length of planning time. Planning notes were distributed to each individual and they were encouraged to use the notes in their own ways in their preferred language, either in Korean or English. They were also informed that the assistant would collect the planning notes after the planning time so that they could not refer to their notes while speaking. After the participants completed the main task in planned conditions, they were instructed to fill out the questionnaire. Conversely, in the no planning tasks, learners were instructed to describe the pictures immediately after receiving fifty seconds to understand the storyline following previous planning studies (Foster & Skehan, 1996; Mehnert, 1998; Ortega, 1999; Skehan & Foster, 1997).

3.5 Procedure

The whole process was composed of three sessions that took place in July 2016: the TOEIC speaking test before the main tasks, first two tasks and second
two tasks. The research was conducted in a multimedia room at the high school under the guidance of the researcher with the help of one English teacher of Korean nationality, one tech support representative of the school, and one assistant for supervising the process. All main tasks including the preliminary speaking test were conducted during some portion of regular English classes. All the participants (n=67) took the TOEIC speaking test which lasted for approximately 40 mins and one week later, solely the participants with intermediate low proficiency (n=40) participated in the main tasks (tasks under planned conditions, i.e., SP and CP lasted for approximately 30 mins including the post-task questionnaires while tasks without planning, i.e., SN and CN lasted for approximately 10 mins).

Before the main task, an orientation was held in each session to explain and answer questions about the details on the process of the experiment, including how to record their performances, check the remaining time, and what the participants were required to do. After the orientation session, the researcher handed out earplugs and headsets to the learners and instructed them to follow the instructions on the screen. They were given 50 seconds or 10 minutes to prepare depending on the conditions while looking at the photo sets before retelling the stories. After the allotted time was over, they began to recount the picture sets until the researcher announced the end of the session.

After the task was done, the participants were required to save the recorded files with the given numbers for identification. In planned conditions, they were also asked to fill out the post-task questionnaires to investigate learners’ planning.
process under simple vs. complex conditions. After a five-minute break, they were instructed to prepare for performing the second picture sets. A week later, a second session of third and fourth picture sets was administered.

One of the four treatments of combination of a different order of two independent variables (+/-here-and-now and strategic planning) was randomly assigned to each of the two classes; 1) CP→SP→CN→SN to ten students, 2) CN→SN→CP→SP to another ten students, 3) SP→CP→SN→CN to another ten students, and 4) SN→CN→SP→CP to the other ten students. This differential ordering is to minimize possible effects of the ordering of the treatments on the results. A series of one-way ANOVA for different groupings of task complexity and strategic planning revealed no significant differences among the four different groupings (p>.05).

3.6 Data Analysis

This section presents transcript analysis for measuring lexical complexity, syntactic complexity, accuracy, and fluency (CAF) in Section 3.6.1. Section 3.6.2 shows statistical analyses employed for the current study.

3.6.1 Transcript Analysis

Learners’ individual recorded productions of the four picture sets were transcribed by the researcher and analyzed by the researcher and the English
teacher. Data coding was comprised of the following steps: First, the two raters, i.e., the researcher and the English teacher, found the number of clauses, T-units for syntactic complexity and; next, the two raters identified every error according to the rubric (see Appendix 3). The Pearson correlation coefficients for the interrater reliabilities of the measures between the two raters are .952, .948, and .960 for the number of clauses, T-units and errors respectively. The two raters reached an agreement through 1:1 conference regarding any differences in the numbers after the analyses of the data.

The participants’ oral productions were evaluated in terms of complexity (lexical complexity and syntactic complexity), accuracy, and fluency (CAF), following the convention of the previous studies on task complexity and planning. Operationalization of the measures for each aspect of oral productions is summarized in Table 3.3.

Table 3.3 Measurement for Transcript Analysis (Gilabert, 2007)

<table>
<thead>
<tr>
<th>Category</th>
<th>Measure</th>
<th>Operationalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complexity</td>
<td>Lexical complexity</td>
<td>Guiraud’s index # of types per the square root of # of tokens</td>
</tr>
<tr>
<td></td>
<td>Syntactic Complexity</td>
<td>subordination # of clauses per T-unit</td>
</tr>
<tr>
<td>Accuracy</td>
<td>overall accuracy</td>
<td>number of errors # of errors per 100 words</td>
</tr>
<tr>
<td>Fluency</td>
<td>speed</td>
<td>pruned speech rate # of syllables in pruned speech per minute</td>
</tr>
</tbody>
</table>

Complexity of oral production has been analyzed in terms of the complexity of syntactic structures of the utterances although learners’ use of lexically more complex language is another essential element in estimating learners’ oral
complexity (Skehan & Foster, 2012); thus, the current study includes lexical complexity as well as syntactic complexity in measuring the oral complexity of the learners’ utterances. The type/token ratio had been extensively used as a measure of lexical complexity of oral production until the serious problem of vulnerability to text length had been identified (Vermeer, 2000). Among various alternatives to this measure, the Guiraud’s index of lexical richness has been advanced with an advantage of compensating for the differing text length (Gilabert, 2007). Type and token were calculated through Text Content Analysis Tool\(^\text{11}\).

Oral syntactic complexity was traditionally measured by using the C/T unit and the utterance. The current study selected the T-unit as a basic unit to measure the syntactic complexity of the learners’ oral productions given the characteristics of the tasks used. Picture-cued description tasks did not involve any interaction with elliptical utterances being less likely to occur. T-unit refers to one main clause with subordinate clauses\(^\text{12}\) being attached or embedded within it (Hunt, 1965). One compound sentence was analyzed as two T-units, while one simple or complex sentence was analyzed as one T-unit. Additionally, appositive sentences or fragment of clauses counted as one T-unit.

Accuracy of the participants’ oral performances was measured in terms of errors per 100 words. Errors of the linguistic items chosen for this study were the

\(^{11}\) This can be accessed at https://www.usingenglish.com/resources/text-statistics.php.

\(^{12}\) Subordinate clauses, according to Brock (1986), are defined as finite and nonfinite nominal, adjectives, and adverbial clauses.
object of analysis: including subject-verb agreement; basic sentence structures; to-infinitives and gerunds; conjunctions; comparatives and superlatives (see Appendix 3 for more detailed information). These items were chosen based on the overlapping items appearing in first and second-year middle school textbooks. Previous studies in task complexity and planning have used error-free clauses (Elder & Iwashita, 2005; Ellis & Yuan, 2005; Skehan & Foster, 2005; Tavakoli & Skehan, 2005), error-free clauses of different lengths (Skehan & Foster, 2005), or the target-like use (TLU) of articles (Rahimpour, 1997; Robinson, 1995). However, accuracy should not be measured with reference to the norms of the target language, but to the learners’ current level of proficiency (Bley-Vroman, 1983; Robinson, 2001b). The two independent variables of this study do not potentially affect linguistic forms unknown to the participants in any significant way. The role of planning in terms of accurate performances is on monitoring in speech production models rather than acquiring new linguistic features (Ellis, 2009). Similarly, the effects of increasing the cognitive complexity of tasks through +/-here-and-now (i.e., resource-directing dimensions) on accurate productions are that it promotes learners to put more efforts in linguistic encoding and noticing the errors in their productions (Robinson 2001a). Therefore, the potential effects of the variables on accuracy are solely effective under the assumption that the participants already possessed at least declarative knowledge of specific linguistic items measured. In other words, using linguistic items published by Dong-A, Chunjae, and Jihak textbook publishing companies.
unknown to the learners as measures of oral accuracy would not reject the claim that the decrease or no significance in the performance in terms of accuracy could be attributed to the learners’ lack of the declarative knowledge of it (e.g., the article system or the subjunctive mood) instead of the effects of the variables.

For measuring fluency of the participants’ oral performances, the rate of pruned speech was selected to code the recorded files (following Gilabert, 2007). Griffiths (1991) stated that this measure of fluency has an advantage over other measures used such as the amount of speech and the length of pauses because the current method includes the latter measures. Pruning refers to the process of removing redundancy in productions caused by the performative problems such as fillers (e.g., uh, well, or um) and words or phrases spoken not in the target language. The speakers’ abandoned words, followed by repetition, reformulation or substitution of the earlier forms, were also excluded in pruned speech. The number of syllables were counted using Syllable Counter\textsuperscript{14}. The measures of complexity and accuracy were also based on the pruned version of the transcripts.

3.6.2 Statistical Analysis

Statistical analyses were implemented using SPSS (v. 20.0 for Windows) to answer the research questions. First, in order to deal with the first research question, a series of repeated two-way analysis of variance (ANOVA) were

\textsuperscript{14} This can be viewed by accessing the following link: http://www.wordcalc.com.
employed with task complexity (+/-here-and-now) and planning time (= planning/no planning) as independent variables and four dependent variables, which were the transcript analysis measures indicating complexity (lexical and syntactic), accuracy, and fluency of oral production. Additionally, a series of paired samples t-test were conducted to determine the exact location of the difference after two-way ANOVA. Second, a series of paired samples t-test were used to analyze the data from the two post-task questionnaires.
CHAPTER 4.
RESULTS AND DISCUSSION

This chapter provides the results of the present study to answer the research questions and discusses the findings. Section 4.1 deals with the first research question regarding the effects of task complexity and strategic planning on oral complexity, accuracy and fluency (CAF). Section 4.2 addresses the second research question concerning the effects of task complexity on planning processes.

4.1 Effects of Task Complexity and Planning on CAF

To examine the overall effects of the conditions (i.e., simple no planning [SN], complex no planning [CN], simple planning [SP], and complex planning [CP]) with diverse combinations of task complexity and planning, the sum of their performance scores under different conditions was analyzed in terms of CAF. Table 4.1 summarizes the overall means and the standard deviations of the CAF scores.
Table 4.1 Descriptive Statistics of the Participants’ CAF Scores According to the Conditions

<table>
<thead>
<tr>
<th>Dependent Var.</th>
<th>Condition</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
</table>
| Lexical complexity  
  (types per the square root of tokens) | SN       | 4.8225     | .71754         | 40 |
|                  | CN       | 4.2308     | .60131         | 40 |
|                  | SP       | 4.8034     | .78571         | 40 |
|                  | CP       | 4.6561     | .62303         | 40 |
| Syntactic complexity  
  (clauses per T-unit) | SN       | 1.3240     | .23333         | 40 |
|                  | CN       | 1.5070     | .27748         | 40 |
|                  | SP       | 1.5222     | .36793         | 40 |
|                  | CP       | 1.7044     | .38624         | 40 |
| Accuracy  
  (errors per 100 words) | SN       | 5.4870     | 4.55966        | 40 |
|                  | CN       | 5.1948     | 3.66261        | 40 |
|                  | SP       | 6.5055     | 4.48668        | 40 |
|                  | CP       | 3.5579     | 3.04351        | 40 |
| Fluency  
  (syllables per minute) | SN       | 59.4843    | 20.48304       | 40 |
|                  | CN       | 58.8080    | 20.21525       | 40 |
|                  | SP       | 72.0602    | 24.51127       | 40 |
|                  | CP       | 71.0086    | 20.81515       | 40 |

Notes: The measure for accuracy is the number of errors per 100 words. The scores presented in the table are inversely proportional to the degree of accuracy. Higher scores equal with the higher proportion of errors. S, C, N, and P refer to simple, complex, no planning, and planning, respectively.

As shown in Table 4.1, cognitively simple/complex tasks (manipulated through +/-here-and-now) operate in a more consistent way than planned/unplanned conditions (i.e., planning vs. no planning). Learners under conditions SN and SP showed better performances than conditions CN and CP in terms of lexical complexity and fluency while the opposite is the case with regard to syntactic complexity and accuracy. This implies that relatively higher lexical complexity and fluency of the language was found in simple tasks in the current study whereas the interlanguage of the learners performing more complex
versions of tasks was syntactically more complex and accurate. On the other hand, although improved performances were invariably found in planned conditions in terms of syntactic complexity and fluency, the occurrences of lexically more complex or accurate language are less predictable, depending on the involvement of the other factor (i.e., task complexity). For example, the participants benefited from planned conditions regarding lexical complexity and accuracy given the condition of accompanying cognitively more complex condition.

In order to verify the statistically significant effects of each independent variable (i.e., task complexity and planning), a set of two-way repeated measures analysis of variance (ANOVA) were employed. The following Sections 4.1.1, 4.1.2 and 4.1.3 present the main effects of the task complexity and planning and the interaction effects respectively.

**4.1.1 Effects of Task Complexity on CAF**

The summary of a series of two-way repeated measures analysis of variance (ANOVA) is presented in Table 4.2. Differing effects of task complexity were found on lexical complexity versus syntactic complexity and accuracy—lexical complexity negatively influenced and syntactic complexity and accuracy positively affected with statistical significance. As seen in Table 4.2, the main effects of task complexity on lexical complexity ($F[1, 39] = 23.402, p = .000, \eta^2 = .375$), syntactic complexity ($F[1, 39] = 20.919, p = .000, \eta^2 = .349$) and accuracy ($F[1, 39] = 11.922, p = .001, \eta^2 = .234$) are statistically significant while it did not influence fluency considerably, $F[1, 39] = .113, p = .738, \eta^2 = .003$. 

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Table 4.2 Effects of Task Complexity on CAF

<table>
<thead>
<tr>
<th>Dependent Var.</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lexical Complexity</td>
<td>5.462</td>
<td>1</td>
<td>5.462</td>
<td>23.402</td>
<td>.000**</td>
<td>.375</td>
</tr>
<tr>
<td>Error</td>
<td>9.102</td>
<td>39</td>
<td>.233</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syntactic Complexity</td>
<td>1.334</td>
<td>1</td>
<td>1.334</td>
<td>20.919</td>
<td>.000**</td>
<td>.349</td>
</tr>
<tr>
<td>Error</td>
<td>2.488</td>
<td>39</td>
<td>.064</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>104.958</td>
<td>1</td>
<td>104.958</td>
<td>11.922</td>
<td>.001**</td>
<td>.234</td>
</tr>
<tr>
<td>Error</td>
<td>343.348</td>
<td>39</td>
<td>8.804</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluency</td>
<td>29.857</td>
<td>1</td>
<td>29.857</td>
<td>.113</td>
<td>.738</td>
<td>.003</td>
</tr>
<tr>
<td>Error</td>
<td>10270.104</td>
<td>39</td>
<td>263.336</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p<.01

A series of paired samples t-test were further conducted to isolate the precise location of the significant differences in conditions in terms of lexical complexity, syntactic complexity and accuracy. Effects of task complexity on oral fluency are not further analyzed as there are no significant observable differences in the mean scores of learners’ fluency between simple and complex tasks nor do the ANOVA analyses show significant effects of task complexity on this area.
Table 4.3 Effects of Task Complexity on CAF According to Different Pairs

<table>
<thead>
<tr>
<th>Dependent Var.</th>
<th>Pair</th>
<th>Mean</th>
<th>s.d.</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lexical Complexity</td>
<td>SN-CN</td>
<td>.5917</td>
<td>.8060</td>
<td>4.643</td>
<td>.000**</td>
</tr>
<tr>
<td></td>
<td>SP-CP</td>
<td>.1473</td>
<td>.6022</td>
<td>1.547</td>
<td>.130</td>
</tr>
<tr>
<td>Syntactic Complexity</td>
<td>SN-CN</td>
<td>-.1830</td>
<td>.2639</td>
<td>-.4387</td>
<td>.000**</td>
</tr>
<tr>
<td></td>
<td>SP-CP</td>
<td>-.1823</td>
<td>.4197</td>
<td>-.2746</td>
<td>.009**</td>
</tr>
<tr>
<td>Accuracy</td>
<td>SN-CN</td>
<td>.2922</td>
<td>4.3977</td>
<td>.420</td>
<td>.677</td>
</tr>
<tr>
<td></td>
<td>SP-CP</td>
<td>2.9476</td>
<td>4.1585</td>
<td>4.483</td>
<td>.000**</td>
</tr>
</tbody>
</table>

**p<.01

As presented in Table 4.3, the effects of task complexity on syntactic complexity are statistically significant regardless of the involvement of the other independent variable, planning (both ps<.01). However, the significance of task complexity factor is contingent on planning regarding lexical complexity and accuracy. In terms of lexical complexity, the differences between simple and complex tasks were significant solely in unplanned conditions, SN-CN (p = .000). There was no statistical difference between tasks differing in task complexity in planned conditions, SP-CP (p = .130). Conversely, task complexity had significant influence on accuracy solely in planned conditions (p = .000), while no significance was observed in unplanned conditions (p = .677).

4.1.2 Effects of Planning on CAF

The summary of a series of two-way repeated measures analysis of variance (ANOVA) is presented in Table 4.4. While planning had positive effects on syntactic complexity and fluency invariably, mixed effects of planning were found with regard to lexical complexity and accuracy.
Table 4.4 Effects of Planning on CAF

<table>
<thead>
<tr>
<th>Dependent Var.</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lexical Complexity</td>
<td>1.649</td>
<td>1</td>
<td>1.649</td>
<td>5.410</td>
<td>.025*</td>
<td>.122</td>
</tr>
<tr>
<td>Error</td>
<td>11.890</td>
<td>39</td>
<td>.305</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syntactic Complexity</td>
<td>1.565</td>
<td>1</td>
<td>1.565</td>
<td>15.733</td>
<td>.000**</td>
<td>.287</td>
</tr>
<tr>
<td>Error</td>
<td>3.880</td>
<td>39</td>
<td>.099</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>3.824</td>
<td>1</td>
<td>3.824</td>
<td>.488</td>
<td>.489</td>
<td>.012</td>
</tr>
<tr>
<td>Error</td>
<td>305.794</td>
<td>39</td>
<td>7.841</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluency</td>
<td>6138.769</td>
<td>1</td>
<td>6138.769</td>
<td>30.972</td>
<td>.000**</td>
<td>.443</td>
</tr>
<tr>
<td>Error</td>
<td>7729.838</td>
<td>39</td>
<td>198.201</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05, **p<.01

As displayed in Table 4.4, the main effects of planning on lexical complexity \( (F[1, 39] = 5.410, p = .025, \eta^2 = .122) \), syntactic complexity \( (F[1, 39] = 15.733, p = .000, \eta^2 = .287) \) and fluency \( (F[1, 39] = 30.972, p = .000, \eta^2 = .443) \) are statistically significant, although planning failed to influence accuracy at the significance level \( (F[1, 39] = .488, p = .489, \eta^2 = .012) \)

A series of paired samples t-test were additionally conducted to identify the specific location of the significant differences in the conditions in terms of lexical complexity, syntactic complexity and fluency. Accuracy was additionally analyzed because of the significant observed mean differences between planned versus unplanned tasks, as shown in Table 4.1.
As shown in Table 4.5, the effects of planning on syntactic complexity and fluency are statistically significant irrespective of task complexity (all \( p < .01 \)). On the other hand, the significance of planning factor was dependent on task complexity regarding lexical complexity and accuracy. The difference between planned and unplanned conditions was significant in complex tasks \( (p = .000) \) with respect to lexical complexity while no statistical significance was found in the simpler pair \( (p = .897) \). Similarly, planning did not have a significant effect on accuracy in the simpler tasks \( (p > .05) \) while differences in accuracy scores between planned versus unplanned tasks reached significance level in the more complex tasks \( (p < .05) \). Note that accuracy of the cognitively simpler task in the planned condition was lower (i.e., the percentage of errors was higher) vis-à-vis the more complex counterpart in terms of mean scores. In other words, learners’ oral performances were syntactically more complex and fluent with planning time regardless of the complexity of the tasks, while planning pushed learners to produce lexically more complex and accurate language solely when coupled with increased cognitive complexity of the tasks.
4.1.3 Interaction Effects of Task Complexity and Planning on CAF

As illustrated in Table 4.6, the interaction effects between task complexity and planning were observed in lexical complexity \((F[1, 39] = 7.242, p = .010, \eta^2 = .157)\) and accuracy \((F[1, 39] = 7.412, p = .010, \eta^2 = .160)\). There were no significant interaction effects found in syntactic complexity \((F[1, 39] = .000, p = .992, \eta^2 = .000)\) and fluency \((F[1, 39] = .011, p = .919, \eta^2 = .000)\). That is, the participants enjoyed additional benefits in lexical complexity and accuracy, independent of the main effects of two IVs, from engaging in tasks manipulated through task complexity and planning simultaneously (see Figure 4.1 and 4.2 for schematic representations of the interaction of the two variables on lexical complexity and accuracy respectively). On the contrary, the two IVs, task complexity and planning, had almost non-overlapping effects on syntactic complexity and fluency.

| Table 4.6 Interaction Effects of Task Complexity and Planning on CAF |
|--------------------------|---------|-------|-----|-------|-----------------|-----------------|
| Dependent Var.          | SS      | df    | MS  | F     | Sig.     | Partial Eta Squared |
| Lexical Complexity      | 1.975   | 1     | 1.975 | 7.242 | .010*    | .157             |
| Error                   | 10.637  | 39    | .273 |       |          |                  |
| Syntactic Complexity    | 6.006E-006 | 1     | 6.006E-006 | .000 | .992    | .000             |
| Error                   | 2.305   | 39    | .059 |       |          |                  |
| Accuracy                | 70.510  | 1     | 70.510 | 7.412 | .010*    | .160             |
| Error                   | 370.991 | 39    | 9.513 |       |          |                  |
| Fluency                 | 1.409   | 1     | 1.409 | .011  | .919     | .000             |
| Error                   | 5227.786 | 39   | 134.046 |       |          |                  |

*p<.05
The measure for accuracy is the number of errors per 100 words. The scores are inversely proportional to the degree of accuracy. Higher scores are equal to the higher proportion of errors.
4.1.4 Discussion for Research Question 1

The first research question aims to investigate the combined effects of task complexity (controlled through +/-here-and-now) and planning. Comparison of the CAF mean scores of the four conditions showed that task complexity made a negative impact on lexical complexity and fluency, and positive impact on syntactic complexity and accuracy. On the other hand, the effects of planning on CAF in terms of the mean scores are more complex, having mixed effects on lexical complexity and accuracy depending on task complexity factor. In order to answer the research question, the main effects of task complexity, planning and interaction effects were separately identified using statistical analyses.

4.1.4.1 Effects of Task Complexity on CAF

A series of Paired Samples t-test followed by a series of two way ANOVA were employed of the effects of task complexity on complexity (both lexical and syntactic) and accuracy. The negative influence of task complexity on lexical complexity was statistically significant in the complex unplanned condition. Planned conditions, however, neutralized the negative impact of task complexity on lexical complexity ($p>.05$). The learners performed better in complex tasks in terms of syntactic complexity in both planned and unplanned conditions ($ps<.01$). Similarly, they also produced more accurate language in complex tasks in both planned and unplanned
conditions\textsuperscript{16}. It should be noted that the difference in accuracy between SN and CN (no planning conditions) which was not statistically significant ($p = .677$) reached statistical significance level in the planned conditions (SP vs. CP), $p = .000$.

A concurrent increase in syntactic complexity and accuracy as well as a decrease in fluency in the current research partially supports Robinson’s Cognition Hypothesis (2001a, 2001b, 2003a, 2005a, 2011) in which tasks manipulated through resource-directing dimensions trigger complex concepts which in turn activate linguistic encoding processing of lemma and syntax as well as monitoring system for identifying erroneous forms with a decrease in fluency\textsuperscript{17}; however, the decrease in lexical complexity does not automatically equate with the lack or decrease of attention to lexical complexity. It is possible that the learners did pay attention to complexifying their utterances lexically (confirmed by their responses to the questionnaires) solely in their L1. According to the bilingual speech production model (Kormos, 2011a), learners’ conceptualization of the message to convey is followed by lexical encoding or “matching of the conceptual specifications” (p. 46) with the lexical information. The conceptualized message activates lemmas both in L1 and L2 competing with each other (Costa, Caramazza, & Sebfastian-Galles, 2000). It has been pointed out that for learners with limited proficiency lexical encoding in the target language could be driven by the semantic elements of the concepts in their mother tongue (Schmitt, 1998). Therefore, it is possible that the

\textsuperscript{16} They produced language with less percentage of errors compared to the other conditions

\textsuperscript{17} Fluency decreased slightly in the cognitively complex tasks compared to simpler counterparts with no statistical significance ($p > .05$).
participants’ utterances were lexically complex in L1 while they lacked the appropriate L2 counterparts to encode the intricacies.

A large portion of the linguistic productions of balanced bilinguals or native speakers consist of formulaic phrases, clauses and sentences given adequate input and automatized processing in \textit{formulator}, whereas the participants of the current study are expected to produce more creatively constructed language (Pawley & Syder, 1983), considering their low-intermediate proficiency. This implies that finding the appropriate word for lexical matching of the complex concepts induced by increased task complexity through resource-directing dimension (i.e., +/-here-and-now, in the current study) demands greater learners’ attentional resources with a consequential significant decrease in the speed with which they perform the tasks. It appears that the participants chose fluency in preference to complexifying their message lexically, according to their responses to the items in the questionnaires. This may also explain why their oral fluency was not severely influenced by more demanding tasks although a slight decrease in fluency was observed ($p>.05$).

\textbf{4.1.4.2 Effects of Planning on CAF}

A series of paired samples t-test followed by a series of two way ANOVA were employed of the effects of planning on CAF showed that planning positively influenced syntactic complexity and fluency with or without task complexity involved. On the other hand, solely giving planning time damaged lexical complexity and accuracy with no statistical significance ($p>.05$). When planning
time was accompanied by increased complexity of the tasks, learners’ performances were enhanced in these two aspects ($p<.01$). The inconsistency of the effects of planning on some areas of CAF (specifically, lexical complexity and accuracy) suggests the possibility of the interaction between planning and task complexity.

The findings of the current study regarding planning comport with many of the previous studies in planning that syntactic complexity and fluency increased (Ellis, 2005) while lexical complexity and accuracy decreased or was not affected significantly (e.g., Ortega, 1999; Tajima, 2003; Wendel, 1997 for lexical complexity, Crookes, 1989; Ellis, 1987; Ortega, 1999 for accuracy). Skehan explains these seesaw effects with his Limited Attentional Model (1998, 2001, 2003, 2009) which states that humans’ limited information processing capacity prohibits L2 learners from paying attention to every aspect of speech production and therefore learners must determine to which aspects to allocate their attentional resources. This results in a trade-off\(^{18}\) between formal aspects of language, i.e., syntactic complexity and accuracy (Ellis, 2005; Skehan, 1996). Learners prioritized complexifying their language over controlling errors in the current study as well as previous research in planning (Ellis, 2005). Skehan (1998) and Robinson (2003b) have a similar view that the role of planning on fluency is as a moderating factor in higher attentional demands. In other words, planning promotes learners’ fluency, as observed in the present study.

\(^{18}\) The trade-off between form and meaning has been argued to exist as well (Ellis, 2005; VanPatten, 1996)
4.1.4.3 Interaction Effects of Task Complexity and Planning on CAF

Lastly, the statistical analyses confirmed the premise made in the findings of planning that there are interaction effects between the two independent variables in lexical complexity and accuracy. Discussion on the interaction is presented below with the two attentional models reviewed in Section 2.3.3: Robinson’s model concentrating on directing learners’ attention to formal aspects of language and Skehan’s model more concerned with providing attentional resources to accomplish a goal considered as desirable by learners.

In CP (complex planned condition), it was expected that learners’ performances would be considerably greater in terms of formal aspects than any other conditions to the extent that task complexity directs learners’ attention to formal aspects (i.e., lexical complexity, syntactic complexity and accuracy) and planning provides attentional resources to accomplish the desirable goals (i.e., formal aspects as a (newly) set goal as well as fluency). As expected, the participants’ more accurate productions were evident in demanding tasks vis-à-vis less challenging versions as learners’ attention was directed to accuracy—one of the aspects of linguistic forms—in cognitively loaded tasks. Their interlanguage was more accurate in the complex, planned condition due to enough attentional resources, with which their goal of performing the task more accurately became more achievable. The gains in accuracy are unlikely to be attributed solely to planning because learners were negatively influenced by planning in simple tasks (SN vs. SP). Additionally, $\eta^2$ ($=0.012$) also indicated that increases in accuracy were less likely to be associated
solely with planning.

Lexical complexity did not improve with planning time in simple conditions (SN vs. SP) although it did in complex conditions (CN vs. CP), which indicates that performatively simple tasks, planned tasks (SN vs. SP), did not assure that learners’ attention was ‘directed’ or ‘channeled’ to lexical complexity while it may be argued that learners directed their attention to lexical complexity in complex tasks (i.e., SN vs. CN and SP vs. CP). The apparent decrease in lexical complexity in complex tasks vis-à-vis their simpler counterparts (mean scores: 4.82 for SN vs. 4.23 for CN; 4.80 for SP vs. 4.66 for CP) overshadows the effects of the resource-directing variable. It appears that beneficial effects are attributable to planning, whereas deleterious effects to task complexity. However, this may be an unsystematic approach that argues planning is ineffective in enhancing lexical complexity in simple tasks (SN vs. SP) whereas it happened to be effective in terms of lexical complexity in complex tasks (CN vs. CP). This is fundamentally incompatible with Skehan’s framework (1998, 2001, 2003, 2009) where complex tasks “consume more attentional resources simply for transaction, with the result that less attention is available for focus on form” (p. 97); therefore, learners’ attention was arguably directed to lexical complexity—another formal aspect—through manipulating the task complexity although sufficient attentional resources were not provided (leading to a decrease in the scores, mean: 4.82→4.23 from SN to CN). When they were performing complex tasks (-here-and-now) and provided with planning time (attentional resources) to achieve the goal newly set by their directed attention, no statistical difference was found ($p > .05$) even though the observed decrease in mean
scores remains. A possible explanation for this is that the attentional resources available to the learners in complex tasks were exceeded by the required demand of successfully performing the tasks in terms of lexical diversity. This view is supported by the learners’ responses to the questionnaires.

One remaining question is in regard to the absence of interaction between task complexity and planning on syntactic complexity. If learners’ focus was on forms (vs. meaning) and provided with sufficient resources to complete the task, it was expected that they would produce more complex constructions. Nevertheless, no additional benefits were found in combination while task complexity and planning had beneficial effects on syntactic complexity independently.

The first tentative explanation is that the learners already identified syntactic complexity as one of the goals, or their attention was already focused on complexifying their interlanguage syntactically when they were given planning time. This was supported by data gathered from planning notes and post-task questionnaires. Planning notes showed the learners’ attempts to add more details in their utterances. Post-task questionnaires also gave clues critical to understanding learners’ focus while planning; the majority of the learners responded that they used part of the planning time to describe the pictures in a more detailed fashion. Further, when given planning time, learners are predisposed to the content of tasks relying on their own interpretation (Coughlan & Duff, 1994) leading to the “transformation of material and ideas in preparation for the task which is to be completed” and this

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19 Interaction here refers to pure interaction effects independent of the individual effects of the two IVs.
change could “drive the learner to using more complex language to reflect the different ideas that are involved, as well as their more complex internal organization” (Skehan & Foster, 2001, p.202). The second possible explanation is the ceiling effect. The learners already reached their highest potentials with the positive effects of task complexity and planning independently.

Given these intertwining relationships between task complexity and planning, different pedagogic aims are obtainable with well-controlled tasks. For example, if syllabus designers are to devise meaning-focused syllabus, in other words, learners’ attention to meaning (fluency) is preferred rather than form (complexity and accuracy), solely giving planning would be sufficient to increase their fluency as they have a predisposition towards meaning, left to their own devices. However, if the intention of the syllabus designers is to shift learners’ attention towards formal aspects, planning coupled with task complexity may generate the greatest effects as their attention is directed towards these aspects with enough resources to display their potential.

One of the gaps unaccounted for in the mixed findings of the previous research in task complexity and planning may potentially be complementarity between Robinson’s (2001a) and Skehan’s (1998) frameworks.
4.2 Effects of Task Complexity on Planning Process

In this section, the second research question—the influence of task complexity on planning process—is dealt with. A series of paired samples t-test were employed to analyze the data gathered from the post-task questionnaires in planned conditions. Quantifiable items (1, 2, 4, and 5) were statistically analyzed and open-ended questions along with planning notes were employed to complement the quantifiable items and CAF scores in explaining the findings.

Item 1 asked, ‘while planning for 10 minutes, how much did you think about each part (1-not at all; 2-little; 3-a little; 4-a lot).’ Learners were asked to respond to each aspects, independent of other aspects in terms of their attentional focus. Hypothetically, learners could check ‘4: a lot’ in every aspect. On the other hand, item 2 forced learners to respond to all the aspects relative to each other regarding their priority in each aspects, asking ‘While planning for 10 minutes, what did you think most in the following components? Please rank from 1 to 5 (1-most; 5-the least).’ With the two differing ways of measuring learners’ attentional focus, more efficient comparison could be made between the simple planned condition (SP) and the complex planned condition (CP) in terms of learners’ attentional allocation to each aspects, the combined amount of attention allocated in all the aspects, and their priority in these aspects. Item 4 asked, ‘While planning for 10 minutes, what did you find most difficult in the following components? Please rank from 1 to 5 (1- the most; 5-the least),’ and item 5 asked, ‘Do you think planning before talking is helpful? (1-not at all; 2-not helpful; 3-helpful; 4-very helpful).’
Differences were examined in learners’ allocation of attentional resources to, priority in, and perceived difficulty of meaning and form, as well as perceived effectiveness of strategic planning depending on task complexity in Sections 4.2.1, 4.2.2, 4.2.3, and 4.2.4, respectively (See Appendix 2).

### 4.2.1 Effects of Task Complexity on Allocation of Attentional Resources to Meaning and Form

Learners’ responses to the item 1 were compared statistically in complex and simple planned conditions with regard to the amount of attention attended to meaning and form, employing a series of paired samples t-test (Table 4.7). In the simpler planned condition, the participants responded that they paid more attention to content \((M = 3.63)\) than the more complex counterpart \((M = 3.56)\) with no statistical significance \((p = .570)\) while their attentional resources were allocated more to grammar, organization, and vocabulary in the more complex version of tasks \((M = 2.30 \text{ vs. } 2.68)\) for grammar, \((M = 2.98 \text{ vs. } 3.10)\) for organization, and \((M = 2.65 \text{ vs. } 2.80)\) for vocabulary) with only grammar having the significance value \((p < .01)\). The extent to which attention was allocated to pronunciation was not significantly affected by the change in the complexity of tasks in planned conditions (both Ms = 2.13, p = 1.000).
Table 4.7 Allocation of Attentional Resources to Meaning and Form

<table>
<thead>
<tr>
<th></th>
<th>SP Mean</th>
<th>SP s.d.</th>
<th>CP Mean</th>
<th>CP s.d.</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>content</td>
<td>3.63</td>
<td>.540</td>
<td>3.56</td>
<td>.712</td>
<td>.572</td>
<td>.570</td>
</tr>
<tr>
<td>grammar</td>
<td>2.30</td>
<td>.883</td>
<td>2.68</td>
<td>1.047</td>
<td>-2.940</td>
<td>.005**</td>
</tr>
<tr>
<td>organization</td>
<td>2.98</td>
<td>.832</td>
<td>3.10</td>
<td>.810</td>
<td>-1.302</td>
<td>.200</td>
</tr>
<tr>
<td>pronunciation</td>
<td>2.13</td>
<td>.992</td>
<td>2.13</td>
<td>.966</td>
<td>.000</td>
<td>1.000</td>
</tr>
<tr>
<td>vocabulary</td>
<td>2.65</td>
<td>.921</td>
<td>2.80</td>
<td>.966</td>
<td>-1.062</td>
<td>.295</td>
</tr>
</tbody>
</table>

*Note:* 4-a lot; 1-not at all
**p<.01

### 4.2.2 Effects of Task Complexity on Priority in Meaning and Form

As presented in Table 4.8, a series of paired samples t-test revealed that the participants’ priority in meaning and form did not change between the two planned conditions differing in task complexity, without any statistical significance in all the aspects (all ps>.05): content→organization→vocabulary→grammar→pronunciation.

Table 4.8 Priority in Meaning and Form

<table>
<thead>
<tr>
<th></th>
<th>SP Mean</th>
<th>SP s.d.</th>
<th>CP Mean</th>
<th>CP s.d.</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>content</td>
<td>1.33</td>
<td>.616</td>
<td>1.43</td>
<td>.712</td>
<td>-.941</td>
<td>.352</td>
</tr>
<tr>
<td>grammar</td>
<td>3.63</td>
<td>1.353</td>
<td>3.35</td>
<td>1.210</td>
<td>1.246</td>
<td>.220</td>
</tr>
<tr>
<td>organization</td>
<td>2.48</td>
<td>.987</td>
<td>2.63</td>
<td>1.005</td>
<td>-.924</td>
<td>.361</td>
</tr>
<tr>
<td>pronunciation</td>
<td>4.15</td>
<td>.975</td>
<td>4.40</td>
<td>1.057</td>
<td>-1.818</td>
<td>.077</td>
</tr>
<tr>
<td>vocabulary</td>
<td>3.43</td>
<td>1.010</td>
<td>3.20</td>
<td>1.137</td>
<td>1.388</td>
<td>.173</td>
</tr>
</tbody>
</table>

*Note:* 1-most; 5-least

The priority of content (M: 1.33 for SP and 1.43 for CP), organization (M: 2.48 for SP and 2.63 for CP) and pronunciation (M: 4.15 for SP and 4.40 for CP) was higher in SP while the degree of significance of grammar and vocabulary was
greater in CP with no statistical significance (all \( ps > .05 \)).

4.2.3 Effects of Task Complexity on Perceived Difficulty of Meaning and Form

Table 4.9 illustrates the results of a series of paired samples t-test. Learners’ perceived difficulty of meaning and form was reported higher regarding content, grammar, and pronunciation in CP, the more complex version (\( M \): 3.55 vs. 3.40 for content, 2.40 vs. 2.30 for grammar, and 4.50 vs. 3.95 for pronunciation, with pronunciation having the significance value: \( p < .05 \)). On the contrary, the learners perceived organization (\( M \): 2.83 vs. 3.05) and vocabulary (\( M \): 1.73 vs. 2.30) as more difficult in the simpler task during the planning time with statistically significant difference found in vocabulary scores (\( p < .05 \)).

<table>
<thead>
<tr>
<th></th>
<th>SP Mean</th>
<th>SP s.d.</th>
<th>CP Mean</th>
<th>CP s.d.</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>content</td>
<td>3.55</td>
<td>1.358</td>
<td>3.40</td>
<td>1.355</td>
<td>.583</td>
<td>.563</td>
</tr>
<tr>
<td>grammar</td>
<td>2.40</td>
<td>1.392</td>
<td>2.30</td>
<td>1.159</td>
<td>.344</td>
<td>.732</td>
</tr>
<tr>
<td>organization</td>
<td>2.83</td>
<td>.636</td>
<td>3.05</td>
<td>1.108</td>
<td>-1.177</td>
<td>.246</td>
</tr>
<tr>
<td>pronunciation</td>
<td>4.50</td>
<td>.679</td>
<td>3.95</td>
<td>1.431</td>
<td>2.173</td>
<td>.036*</td>
</tr>
<tr>
<td>vocabulary</td>
<td>1.73</td>
<td>.960</td>
<td>2.30</td>
<td>1.305</td>
<td>-2.719</td>
<td>.010**</td>
</tr>
</tbody>
</table>

Note: 1-most difficult; 5-least difficult
*\( p < .05 \), **\( p < .01 \)

4.2.4 Effects of Task Complexity on Perceived Effectiveness of Planning

Table 4.10 compares the practicality of planning time perceived by the participants in the present study through implementing a paired samples t-test.
Although the learners perceived planning time as more beneficial in CP, the more demanding task ($M$: 3.15 for SP vs. 3.23 for CP), they regarded planning time as beneficial regardless of task complexity ($p > .05$).

Table 4.10 Perceived Effectiveness of Planning

<table>
<thead>
<tr>
<th></th>
<th>SP</th>
<th></th>
<th>CP</th>
<th></th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness</td>
<td>3.15</td>
<td>.141</td>
<td>3.23</td>
<td>.150</td>
<td>-.902</td>
<td>.372</td>
</tr>
</tbody>
</table>

*Note: 1-not helpful at all; 2-not helpful; 3-helpful; 4-very helpful*
4.2.5 Discussion for Research Question 2

The second research question addresses planning processes in the two planned conditions differing in task complexity. This section focuses on the two points of individual differences and directing attention to formal aspects. The first point has been the focus of previous planning process research and was used to complement the findings (Section 4.1 & 4.2 both) of the current study. The second topic of discussion has rarely been studied to date. However, the exploration of directing attention is a valuable source of tangible changes—despite the difficulties inherent in the exploration of psychological process—in attentional allocation perceived by the participants other than the CAF scores.

4.2.5.1 Individual Differences in Planning Processes

First, one of the variables of significant influence on learners’ performances is their attitude towards the opportunity to plan (Ellis, 2009; Ortega, 1999; Tajima, 2003). The participants responded that planning time was beneficial in simple and complex tasks both, although they benefited from planning in complex tasks slightly more with no statistical significance \( (p>.05) \). This explains the gains in several aspects of CAF in the learners’ language productions in the two planned conditions vis-à-vis non-planned ones. Negative attitude towards planning, on the contrary, might restrict learners from fully utilizing the temporal advantage. In a study conducted by Tajima (2003), for example, fluency of the learners’ productions under planned conditions was positively influenced when they viewed
the planning time as beneficial, whereas negative learner attitude towards additional time did not significantly produce positive effects on fluency.

Another individual difference of potential influence on oral performances in SLA is learners’ orientation (Ellis, 2009). The learners of the current thesis prioritized meaning over forms, as indicated in their individual responses to the questionnaires in the two planned conditions. This is in line with the previous findings in a number of strategic planning studies (e.g., Ortega, 1999; Wendel, 1997). The participants’ preoccupation toward meaning may explain the positive effects of planning on syntactic complexity and fluency and negative effects on accuracy\textsuperscript{20} in the current study. Ellis (2005) explains the major roles of strategic planning on syntactic complexity and fluency drawing on Levelt’s model (1987); strategic planning is purported to facilitate learners to make a conceptual plan of the message— influencing fluency and complexity positively— rather than formulation which is contingent on “the readiness of learners to shift attention” (Ellis, 2005, p. 22) to formal aspects, specifically accuracy.

An additional notable finding as to individual differences during planning is the variation in perceived difficulty in pronunciation between two planned conditions. The possible explanation for this is the learners’ insensitivity or inattention to pronunciation, in lieu of actual, meaningful difference in difficulty. This is shown by their responses to the first and second items in the questionnaires; they valued pronunciation the least among all the linguistic aspects (item 2) when

\textsuperscript{20} in the simple planned condition.
performing the picture-describing tasks in both conditions and there was no measurable difference between SP and CP in attention allocated to pronunciation (item 1). In addition, the learners ranked pronunciation the least difficult in both conditions (item 4) in spite of the statistically significant difference ($p<.05$) although typical characteristics of Korean EFL speakers were pervasive across segmental (e.g., phonemes such as p vs. b) and supra-segmental features (e.g., stress, tone, or word junction) in their individual recorded files. If learners responded that they found pronunciation difficult in item 4, it would leave inconclusive the source of learners’ strong Korean accent—their failure of differentiating phonemes of the target language, for instance—across the tasks: learners’ inattention or insensitivity vs. perceived difficulty despite their allocation of attention to pronunciation. Given their responses to item 4 as to pronunciation, the first possibility that learners did not pay much attention in both conditions (i.e., SP and CP) may be more persuasive.

4.2.5.2 Directing Attention to Formal Aspects

The second point of examination is the possibility of shifting learners’ attention to desirable aspects of the language, i.e., formal aspects. In this study, the successful channeling of the learners’ attention to formal aspects was observed as well as their preference for meaning over forms in the planned conditions, particularly *simple* planned condition (SP).

First, items 1 and 2 in the questionnaires verified the statement that the EFL learners with limited proficiency are biased towards meaning (Skehan, 1998)
under planned conditions as well. This, in turn, supports Robinson’s Cognition hypothesis (2001a, 2001b, 2003a, 2005a, 2011) that diminishing the temporal burden along resource-dispersing dimension (e.g., providing planning time) does not automatically channel learners’ attention to linguistic forms. In other words, the effects of planning on formal aspects, specifically accuracy, are not significant.

The learners’ responses to perceived difficulty in diverse aspects (item 4) also suggests their propensity for meaning. They perceived content as the least demanding during the planning time after pronunciation. It is expected in general that learners spend additional time on the parts they have difficulty with. However, learners of this study answered that they paid attention to meaning more than any other aspects presented. The first possibility is that learners prioritized allocating attentional resources to meaning over formal aspects despite the simplicity in the content. In other words, they paid more attention to meaning regardless of the difficulty in the content. Conversely, an alternative explanation is that learners paid more attention to content because of the simplicity in the content. However, views on simplicity as the sole driver of directing attention is not convincing as pronunciation did not get much attention in spite of its perceived easiness.

Alternatively, simplicity in content of the picture sets could have encouraged the learners to add more details in their description of the pictures with their own interpretations. This was shown in their responses to the item 1.1, ‘List anything else that you thought about while planning.’ Some answers were found in which the learners attempted to describe the situations in more detail including circumstances not directly present in the photos such as illustrating the lessons.
feelings of the characters, and more details of the situations. According to Coughlan & Duff (1994), the opportunity to plan can motivate learners to be engaged in the content of tasks with their understanding of what it entails. More complicated content of tasks newly interpreted by individual learners may lead them to producing more complicated language to linguistically encode the complexity in the ideas and internal organization of the stories (Skehan & Foster, 2001). This may explain the increase in syntactic complexity with planning time, as well as a considerable amount of attentional resources allocated to content in spite of its perceived clarity.

The second important point in channeling learners’ attention to formal aspects is mainly based on the comparison of the learners’ responses to items 1 and 2 in the questionnaires: differences in the attentional allocation and priority in different aspects of the target language between SP and CP. In this study, the results demonstrated that when performing the more demanding task, the amount of attentional resources that learners paid to meaning was slightly reduced as well as their priority in meaning relative to other aspects. Interestingly, learners’ priority in organization and pronunciation decreased from SP to CP while they answered that they allocated similar or more amount of attention to these aspects. This apparent contradiction can be resolved by the higher combined scores of all the aspects on the item 1 in CP compared to SP: 13.69 for SP vs. 14.27 for CP. Although their priorities in these aspects decreased in the more challenging task, there could have been equal or greater amount of attention to these aspects given the larger sum of allocated attentional resources in CP. This may imply that the
amount of attentional resources in certain elements would be greater in CP when the degree of the learners’ priorities in these elements are similar in SP and CP. That is, it can be argued—given the greater sum in item 1 under the complex planned condition—that if the priority in certain aspects in CP is equal or higher than in SP, learners paid more attention to these aspects, i.e., learners’ attention was directed towards these aspects.

One potential explanation as to why the sum of item 1 in CP is greater than SP is inefficient allocation of attention in SP; learners did not use up all the attentional resources available. As they tend to focus on meaning in simple tasks, learners might not have been “sufficiently motivated” to focus on form (Skehan and Foster, 2011, p. 187) employing the remaining resources although there was a potential for them to do so.

The second explanation is the redundant allocation of attention to content in SP. This position views the absolute amount of attentional resources employed for both tasks as the same, or insignificantly different as learners’ temporal advantages were similar in both planned conditions—provided with ten-minute planning. For the similar reasons suggested for the first explanation, there is a possibility that more than ‘a lot (4, in item 1)’ of attention was paid to content in SP; too much attention is devoted to meaning rather than form.

The efficient shifting of attention—which either might have been redundantly allocated to meaning (content) or might not have been used fully—to formal aspects according to increasing “functional/communicative demands” (Robinson, 2011, p. 18) is observable through comparing learners’ response scores on
grammar and vocabulary in SP versus CP; more attention was paid to grammar and vocabulary (item 1) and learners’ priorities in grammar and vocabulary also increased (item 2), which shows that learners’ attention was directed to formal aspects. This is consistent with the increases in formal aspects of CAF scores (except for lexical complexity, which will be discussed in more detail subsequently) as well as Robinson’s claims in which the current thesis is partially rooted.

It is noteworthy to mention among various linguistic aspects that learners allocated attention to, solely grammar reached significance level \((p<.01, t = -2.940)\) from SP to CP. This is consistent with the current findings that syntactic complexity and accuracy were enhanced with planning time in the more complex task (CP) compared to SP whereas lexical complexity and fluency did not increase. On the contrary, without statistical significance \((p>.05)\), the participants answered that they allotted more attention to vocabulary in the complex version versus simple one. Although their lexical complexity scores decreased from planned simple to complex tasks, the participants responded that they did pay more attention to vocabulary in CP than SP. This is consistent with the findings and discussion on the first research question regarding performance scores of lexical complexity. While learners’ observed performance scores were reduced, it may be argued that their attention was shifted to lexical complexity in the more complex task.

The first possible explanation why the difference of the said amount of attention to lexical complexity was not significant between the two tasks differing in cognitive complexity might be that certain formal aspects are preferentially
directed before other aspects. Task complexity directed attentional resources to vocabulary, as shown in Table 4.7, without statistical significance ($p > .05$) whereas significantly more amount of attentional resources were channeled towards grammar at statistical significance level ($p < .05$). Lexical complexity might have been directed after syntactic complexity and accuracy.

The second explanation is that not enough attentional resources were provided although task complexity did direct the learners’ attention to vocabulary. In other words, ten-minute planning time was helpful in complementing attentional resources although not sufficient to push the learners to display their highest potential. This is illustrated by the fact that the difference in the lexical complexity scores between simple and complex tasks in no planned conditions (SN vs CN) is significantly greater ($p = .000$) than the one in planned conditions (SP vs. CP) ($p > .05$). This may signify that the participants were considerably in need of additional attentional resources when engaging in difficult tasks under no planned condition, while under planned conditions, other things being equal, their performance was not considerably affected by the difficult task because of the increased attentional resources.

The current findings regarding lexical complexity challenge the previous practice of directly associating attentional allocation with an increase or decrease in CAF, reported by studies in task complexity and planning.
CHAPTER 5.
CONCLUSION

Section 5.1 summarizes the major findings of the present study and proposes several pedagogical implications. Section 5.2 discusses the limitations of the study and provides suggestions for further research.

5.1 Major Findings and Pedagogical Implications

The present study examined the effects of task complexity (controlled through +/-here-and-now) and planning and interaction effects of the two independent variables on complexity (lexical and syntactic), accuracy, and fluency (CAF). First, according to the results, task complexity positively influenced syntactic complexity and accuracy although the effect was significant solely in the case of syntactic complexity while negatively affecting fluency and lexical complexity with solely the decrease in lexical complexity being statistically significant. The decrease in lexical complexity may potentially be attributable to either the learners’ lack of L2 counterparts to encode the complexity in the semantic concepts mapped on their L1 or a concession to minimize the negative effects on fluency. Second, planning had considerably beneficial effects on syntactic complexity and fluency, whereas planning time slightly negatively influenced lexical complexity and accuracy. In particular, planning in complex conditions positively influenced accuracy and lexical complexity, while the two independent variables (i.e., task complexity and planning) had no considerable effects on these two aspects.
independently. No significant interactions were identified between task complexity and planning on syntactic complexity, which is possibly due to the ceiling effect or a predisposition to describing the content of tasks with their own interpretations that may have led to more complicated ideas and organization (Skehan & Foster, 2001).

The current study also empirically investigated the effects of task complexity on planning process. First, learners’ positive attitude towards planning time and their predisposition towards meaning in planned conditions were detected. Second, the channeling of attention—which might have been inefficiently employed—to formal aspects successfully occurred in CP compared to SP. Grammar—among various linguistic aspects that learners allocated attention to—reached a significance level from SP to CP, whereas lexical complexity was not substantially affected potentially due to the preferential allocation of attention in certain aspects (i.e., syntactic complexity and accuracy) over another (i.e., lexical complexity) or insufficient attentional resources available, although learners did pay more attention to vocabulary in CP than in SP.

Based on the current findings, this study suggests the following pedagogical implications:

1) Speaking tasks could be differentially manipulated according to the intentions of task/syllabus designers, as various pedagogical goals are achievable through differential manipulation of tasks through resource-directing and/or dispersing dimensions;

2) As learners might not benefit from planning with negative attitude toward
the opportunity, teachers should encourage learners to have positive attitude toward planning (e.g., through emphasizing potentially significant roles of planning in their performances); and

3) An awareness about the nature of learners’ L2 speaking performances should be enhanced; more diverse factors—such as learners’ linguistic resources, attentional resources available regarding specific tasks, the degree of formal aspects required for specific tasks, and learners’ orientation in specific tasks—should be taken into consideration to account for the variation in performance scores (i.e., CAF in this study) rather than directly associating the fluctuation with cognitive psychological process of attentional allocation.

5.2 Limitations and Suggestions for Further Research

The present study has several limitations. First, given the small sample size of forty high school learners in a specific context in Korea, it may be difficult to generalize the findings of the current study to other high school learners in Korea as well as in other EFL contexts. Therefore, further studies should be conducted with a larger sample size to determine the applicability of the current findings in other contexts. Second, delayed effects—regarding task complexity, planning, and/or their interaction—were not examined in the current study. Thus, instituting a delayed posttest is recommended in future research. Third, although the four sets of pictures employed in the main tasks of this study were controlled to a certain extent, stricter control over the difficulty of the picture sets should be exerted in
subsequent studies. Fourth, findings of this study regarding lexical complexity identified the two factors which were not controlled in the current study—learners’ previous receptive and/or productive vocabulary size and the differential time given for planning opportunity—as the potential variables to influence the way in which task complexity and planning affect learners’ performances in regard to lexical complexity. Including these two potentially influential variables in subsequent studies on task complexity and planning might shed new light on their effects on L2 speaking performances. Finally, the present study did not investigate effects of task complexity, planning, and their interaction on linguistic productions of the learners who are predisposed to forms of the target language rather than meaning. Furthermore, the learners of the present study expressed positive attitude towards planning, while negative attitude towards planning might restrict potential benefits of planning, as reported in Tajima (2003). It is recommended, therefore, that future studies address potentially differential effects of the independent variables of this study on CAF depending on learners’ orientation in L2 speaking tasks (i.e., focus on form vs. meaning), or attitude toward planning.

Despite these limitations, the present study is of great significance: a) To date, few studies attempted to employ both Skehan’s (1998) and Robinson’s (2001a) frameworks in accounting for learners’ performances while the current study captures the potentially complementary nature of the two models; b) combined effects as well as independent effects of task complexity and planning—which were not sufficiently investigated in the studies—were identified, which provides teachers and syllabus designers with valuable information on decision making for
speaking tasks; and c) the exploration on attentional allocation was more efficiently made through comparing learners’ planning process in the two planned conditions differing in cognitive complexity (+/-here-and-now) which presents a major shift in learners’ allocation of attention, in addition to the learners’ observed performance scores.
Ahmadian, M. J. (2012). The effects of guided careful online planning on complexity, accuracy and fluency in intermediate EFL learners’ oral production: The case of English articles. Language Teaching Research, 16(1), 129-149.


Park, S. (2009). What do Learners do while planning? Learners’ use and perceptions of planning for an oral narrative task. *English Language and

Piri, F., Barati, H., & Ketabi, S. (2012). The effects of pre-task, on-line, and both pre-task and on-line planning on fluency, complexity, and accuracy-The case of Iranian EFL learners' written production. English Language Teaching, 5(6), 158.


Language Teaching, 45(3), 193-213.


Begin the story like this: Today, the math teacher is giving us lecture and he explains many things on the textbook and write things on the blackboard. Minho and his classmates are listening to him.
APPENDIX 1-2. Picture set for CN

Begin the story like this: 2 years ago, Minho's classmates were changing clothes for the P.E. class. They didn't seem to like P.E. much because they didn't look enthusiastic but they were changing their clothes anyway.
APPENDIX 1-3. Picture set for SP

Begin the story like this: Today Minho is sleeping on his bed. The clock shows it's 9 o'clock and it seems that it's 9 A.M. because it's not dark outside of the window.
Begin the story like this: 2 years ago, it was during the math class. The math teacher was giving us the lecture and Minho and his classmates were listening to the teacher very carefully because they were not very good at math.
APPENDIX 2. Post-task Questionnaire

Post-task questionnaire only on planned conditions [A/B]


1. 10분간 계획을 할 때, 다음 부분에 얼마나 생각했습니까?

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<td>문법(grammar)</td>
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<td>구성(organization)</td>
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<td>어휘(vocabulary)</td>
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1.1. 그 외에 계획 중 생각한 것이 있다면 적어주세요.
2. 10분간 계획할 때, 다음의 네 가지 요소 중 어떤 것에 관해 가장 많이 생각했습니까? 1부터 5까지 등급을 매겨주십시오. 1은 가장 많이 생각한 것이고, 5는 가장 적게 생각한 것입니다.
내용  문법  구성  발음  어휘

2.1. 당신은 1부터 5까지 등급을 매겼습니다. 왜 그렇게 등급을 매겼습니까?

3. 10분간 계획했을 때, 다음 질문과 관련하여 대답해주십시오. (만약, 질문에 대한 대답이 “아니오”라면 4번 문제를 바로 풀어주시기 바랍니다.)

3.1. (그림의 내용-학교생활과 관련하여) 그림을 묘사하는 것이 어려웠습니까? (즉, 그림 자체가 어려웠습니까?)
구체적인 예와 함께 이유를 설명해주십시오.

3.2. 이야기를 잘 구성하는 것이 어려웠습니까?
구체적인 예와 함께 이유를 설명해주십시오.

3.2. 문법을 정확하게 사용하는 것이 어려웠습니까?
구체적인 예와 함께 이유를 설명해주십시오.

3.3. 어떤 단어들의 발음을 정확히 발음하는 것이 어려웠습니까?
구체적인 예와 함께 이유를 설명해주십시오.
3.4. 어떤 의미를 표현하기 위해 적절한 단어를 찾는데 어려웠습니까?
구체적인 예와 함께 이유를 설명해주십시오.

3.5. 위에 적은 것 외에, 어려웠던 내용이 있다면 적어주십시오.

4. 10분간 계획을 하면서, 다음 네 가지 사항 중 어떤 것이 가장 어려웠습니까?
(1-가장 어렵다 5-어렵지않다)
내용____ 문법____ 구성____ 발음____ 어휘____

5. 그림을 묘사하기 전에 계획을 해서 더 말을 잘 하게 되었다고 생각하십니까?
매우 그렇다 전혀 아니다
4 3 2 1
5.1. 왜 그렇게 생각하십니까?

6. 10분간 계획할 때, 다음이 기억나십니까?

6.1. 내용
a) 어떤 그림들이 가장 기억에 잘 남는지 말해주십시오
b) 그것을 묘사할 때 무슨 생각을 하고 있었습니까?
6.2. 문법
   a) 기억나는 문법 예시들을 모두 적어주십시오.
   b) 이 예시들을 사용할 때 무슨 생각을 하고 있었습니까?

6.3. 발음
   a) 기억나는 발음의 예시를 모두 적어주십시오.
   b) 이 단어들을 사용할 때 무슨 생각을 하고 있었습니까?

6.4. 어휘
   a) 기억나는 단어의 예시를 모두 적어주십시오.
   b) 이 단어들을 사용할 때 무슨 생각을 하고 있었습니까?

6.5. 위에 적은 것 외에, 지금 기억나는 것, 그리고 그 당시에 생각하고 있던 것을 적어주십시오.
APPENDIX 3. Evaluation Items for Accuracy

1. 수일치

① There is/are & there was/were
주요평가항목: there is/are & there was/were 이후에 나오는 의미상 주어와 수일치가 잘 되었는지 확인한다.
틀린 예: *there is/was three cats over there.

② be 동사와 일반동사
주요평가항목: be 동사와 일반동사가 주어와의 수일치가 올바른지 평가한다.
추가평가항목: 한 문장에 주동사 하나가 잘 쓰였는지 평가한다.
(틀린 예: *I am play the piano) 이 경우, 오류 1개로 인정한다.
단, She is play the piano와 같이 ‘is’를 불필요하게 사용했다는 오류와 ‘play’와 주어의 수일치가 틀렸다는 오류가 발생했으므로 오류 2개로 인정한다.
추가평가항목: be 동사와 일반동사의 부정문의 쓰임 중 부정어(not)의 위치가 올바른지 평가한다.

③ 관계대명사의 주격과 목적격
주요평가항목: 관계대명사의 선행사와 관계대명사절의 동사의 수일치를 평가한다.
틀린 예: *She has two bags that is expensive.
추가평가항목: 사람/사물인 선행사에 맞는 적절한 관계사가 사용되었는지를 평가한다.
틀린 예: *I know a girl which is sitting next to him

2. 2~5형식의 전형적 쓰임

① 2형식
주요평가항목: [2형식 동사 + 보어]의 형태를 잘 사용하고 있는지 평가한다.
틀린 예: *she looks beautifully.

② 3형식
주요평가항목: [3형식 동사 + 목적어]의 형태를 잘 사용하고 있는지 평가한다.
틀린 예: *I love.

③ 4형식
틀린 예: *She gave him. *She gave book the boy

④ 5형식
주요평가항목: [5형식 동사 + 목적어 + to부정사]의 형태를 올바르게 사용하고 있는지를 평가한다.
틀린 예: *She asked him lend her clothes
지각동사와 사역동사의 쓰임이 올바른지 평가한다.

지각동사와 사역동사의 쓰임이 올바른지 평가한다.

원형부정사 혹은 분사를 사용해야 하는 경우에 올바르지 않은 대용물을 사용하고 있는지를 중심으로 평가한다.
틀린 예: *I made her to clean her room

3. to부정사와 동명사
①to부정사:
주요평가항목: to부정사의 명사/형용사/부사적 용법이 용도에 맞게 잘 사용되었는지 평가한다.
틀린 예: *I want to helping her

②동명사:
주요평가항목: (동)명사자리에 동명사가 잘 사용되었는지 평가한다.
틀린 예: *I like collect stamps. *I supported him by give him encouragement

4. 접속사
주요평가항목: 동위접속사 및 종속접속사가 문장과 문장을 연결하는 용도로 잘 사용되었는지 평가한다.
틀린 예: *I will help him in spite of I don’t like him.

*I will help him because like him

5. 형용사와 부사의 비교급/최상급
비교급 표현과 최상급 표현이 각각 잘 사용되었는지 평가한다.
틀린 예: *she is more happy than him.
국 문 초 록

본 연구는 +/-here-and-now로 조작한 과업 복잡성(task complexity)과 계획(planning)이 영어 말하기 중급(intermediate low)인 한국 고등학생들의 두 측면에서의 수행능력에 미치는 상호작용에 대하여 알아보고자 한다. 복잡성, 정확성, 유창성 (CAF)과 관련한 말하기 수행에 미치는 영향과 계획 중언어적 측면으로의 집중과함으로 관련된 인지 심리학적 수행에 미치는 영향.

본 연구를 위하여 참가한 영어 말하기 중급의 40명의 한국 고등학생들은 네 가지 다른 조건—간단한 무계획(SN), 복잡한 무계획(CN), 간단한 계획(SP), 그리고 복잡한 계획(CP)—에서 그림 묘사하기 과업을 수행하였다. 학습자들의 계획 과정을 조사하기 위하여, 계획이 포함된 조건(SP와 CP)이 종료된 후에 설문지를 실시하였다.

본 연구 결과에 따르면, 과업 복잡성과 계획은 CAF로 측정된 말하기 수행의 여러 측면에 영향을 미치는 것으로 나타났다; 즉, 과업 복잡성은 통사적 복잡성과 정확성에 긍정적 영향을 미친 반면—통사적 복잡성에서만 통계적으로 유의미한 수준에 도달하였다—어휘적 복잡성과 유창성에는 부정적 영향을 미쳤다—어휘적 복잡성에서의 감소만이 통계적으로 유의미하였다. 계획이 포함된 조건에서, 참가자들은 상당한 수준에서 통사적으로 더욱 복잡하고 유창한 언어를 생성하였으나, 정확성과 어휘적 복잡성은 경미하게 감소하였다. 이러한 두 독립변인의 개별적 효과와 함께, 어휘적 복잡성과 정확성에서 두변인의 상호작용의 효과도 관찰되었다; 두 독립변인이 개별적으로는 유의미하게 긍정적인 영향을 미치지 못하였으나, 두 변인은 동시에 이러한 언어 측면 (즉, 어휘적 복잡성과 정확성)에 대하여 유의미한
수준으로 학습자들의 발화에 긍정적인 영향을 미쳤다.

CAF로 나타난 학습자들의 수행 점수에 더하여, 계획이 포함된 두 조건에서의 설명지 응답을 통하여 복잡성이 다른 과업들에 따라 변하는 학습자들의 집중할당을 가시적으로 관찰하였다; 의미에 대하여 우선적으로 집중하는 학습자들의 경향에도 불구하고, 계획 조건, 특히 단순한 계획조건(SP)하에서, 비효율적으로 사용되었을 가능성이 있는 학습자들의 집중이 CP조건에서 형태적 측면으로 성공적으로 돌려졌는데, 이는 +/-here-and-now의 자원 집중(resource-directing) 변수와 계획의 자원 분산(resource-dispersing) 변수의 결합된 효과로 인한 것으로 보여진다.

본 연구는 다음과 같은 교육적 함의를 가진다; 첫째, 자원 집중 그리고 혹은 자원 분산 변수를 다양하게 조작하여 여러 교육 목표를 달성할 수 있다; 둘째, 계획의 잠재 효과를 극대화하기 위해서는 학습자가 계획 시간이 주어진 것에 대하여 긍정적 태도를 갖도록 장려해야 한다; 그리고 셋째, 학습자들의 관찰된 수행을 설명하는 데 여러 요인들을 포함하기 위하여, 학습자의 제2언어 발하기 수행의 본질에 대한 인식이 발전되어야 한다.

주요어: 인지이론, 상충이론, 말하기 과업 설계, 과업의 복잡성 조작, 자원 집중 및 분산 변수의 동시적 조작
학번: 2015-21846