

The Effects of Online Planning on CAF in L2 Spoken and Written Performance^{*}

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The purpose of this study is to investigate the effects of no planning and online planning on complexity, accuracy, and fluency (CAF) in L2 spoken and written tasks. The study was designed into 2x2 with two independent variables: planning conditions (no planning and online planning) and task modality (speaking and writing). First, 80 Korean EFL undergraduates performed two tasks in a laboratory setting: a proficiency-assigning narrative spoken task and a randomly assigned main task. The main task had four different conditions: no planning in speaking, online planning in speaking, no planning in writing, and online planning in writing. The participants' spoken and written performances were measured and analyzed for syntactic complexity, accuracy, and fluency. The findings demonstrated that the no planning (NP) group improved accuracy and fluency significantly more than the online planning (OP) group in the spoken task and that the NP group improved their fluency more than the OP group in the written task. Additionally, in both planning conditions, the written task increased accuracy more than the spoken task, whereas the spoken task increased fluency more than the written task. It is hoped that these findings will facilitate understanding of the supportive role of planning in task manipulation in terms of L2 learners' limited attentional resources and its relationship with linguistic performance.

Key words: planning, online planning, complexity, accuracy, fluency, CAF, task manipulation, limited attentional resource capacity

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1. INTRODUCTION

Planning studies in task-based research have been motivated by the cognitive information-processing approach (i.e., Ellis, 2009; Skehan & Foster, 2001) and limited attentional resource capacity, which claims humans are unable to attend fully to all aspects of linguistic performance. Tavakoli (2014, p. 218) claims that it is crucial to understand “how learners allocate their attentional resources to the different demands of performing and completing tasks, and whether and how the allocation of these resources interacts with the cognitive processes involved in second language (L2) acquisition.” Skehan (1996, 1998) distinguishes three aspects of linguistic performance: complexity, accuracy, and fluency (CAF). Complexity is regarded as the rich elaboration of the produced language, whereas accuracy concerns the extent to which the produced language complies with target language norms. Fluency is regarded as the learner’s capacity to produce language in real time without hesitation or pausing. These three aspects of linguistic performance are differently affected by the particular task conditions or task features (e.g., planning, task complexity, task familiarity). According to Skehan (2009), there is a seesaw relationship between form (complexity and accuracy) and fluency, while there is a competitive relationship between complexity and accuracy. Skehan (2016) suggests that planning is one of the important task conditions that has a systematic relationship with linguistic performance (i.e., CAF) and supports L2 learners’ limited attentional resources.

Ellis (2005) divides planning into *pre-task planning* and *online planning*. Most planning studies (e.g., Crookes, 1989; Elder & Iwashita, 2005; Foster, 1996; Foster & Skehan, 1999; Gilabert, 2007; Mehnert, 1998; Sangarun, 2005; Skehan & Foster, 1997; Tavakoli & Skehan, 2005) have dealt with the pre-task planning variable rather than online planning (Ahmadian, 2012; Ellis & Yuan, 2004, 2005; Yuan & Ellis, 2003) in spoken and written tasks. Following Mehnert’s (1998) study, 10 minutes are allotted as pre-task planning time before performing the tasks. Pre-task planning generally improves fluency consistently in spoken language, but its impact on fluency is slightly inconsistent in written tasks. Increases in complexity and accuracy are not consistent in either spoken or written tasks, yet the trade-off relationship between complexity and accuracy has been observed in many pre-task planning studies (Crookes, 1989; Foster, 1996; Foster & Skehan, 1999; Gilabert, 2007; Mehnert, 1998; Skehan & Foster, 1997). On the other hand, few online planning studies have been investigated and the results of those that have been conducted have been unclear. When unlimited time is allotted while performing tasks, complexity or/and accuracy increase but fluency decreases in spoken tasks (Ahmadian, 2012; Yuan & Ellis, 2003). However, in written tasks, Ellis and Yuan (2004) found that only accuracy improves, while another study (2005) by the same authors demonstrated that both complexity and accuracy improve.

Previous planning studies have encountered a number of problems. First, the number of online planning studies is scarce and thus more empirical data are required to generate the overall effect of online planning compared to pre-task planning which has been widely investigated. Online planning studies are required in both spoken and written tasks. Second, the online planning condition has not been valid in terms of observing its effect on CAF. Since an unlimited time has been allocated for online planning while performing the tasks, information regarding when and for how long online planning is used might differ for all participants. A careful control of the time participants spend on online planning is required and the possibilities of revising the written tasks should be eliminated to increase the validity and reliability of the study. Third, planning is an external resource compensating strategy, particularly for intermediate L2 learners rather than advanced learners (Kim, 2017); however, most planning studies have been conducted with “learners who were at the roughly intermediate proficiency level” (Ellis, 2009, p. 491) or without careful consideration of proficiency level. Thus, a refined proficiency level should be included with the online planning variable to expand the scope of planning studies. Motivated by the above problems, the purpose of the present study is to investigate the effects of online planning on linguistic performance, complexity, accuracy, and fluency in both spoken and written tasks.

2. LITERATURE REVIEW

2.1. Psycholinguistic Speech and Writing Process Models

The impacts of planning on CAF have been explained by psycholinguistic processing models. Kormos’s (2006, 2011) L2 speech processing model was developed from Levelt’s first language (L1) speech model (1993, 1999), which contains three phases: *conceptualization* in which content ideas and the intention of the message are gathered and the whole process of speech is monitored; *formulation* in which a propositional message is accessed to lexical lemmas, and syntactic and phonological encoding occurs for preverbal messages, and *articulation* in which overt speech sound is produced. Compared to L1 speaking in which the conceptualizer needs attention but the formulator and articulator proceed automatically, less proficient L2 speakers need to pay more attention to both conceptualization and formulation processing, and thus L2 speakers must often decide “what they pay attention to when monitoring and these decisions most frequently involve prioritizing content over form, lexis or grammar, or vice versa” (Kormos, 2006, p. 173). In relation to CAF, since L2 speakers’ conceptualizer and formulator require more effort, they need to create a balance between fluency and grammatical complexity and accuracy. As a

result, trade-off effects occur between fluency (from the conceptualizer), accuracy (from monitoring in the conceptualizer), and complexity (from the formulator) (Kormos, 2011).

In a similar vein, Kellogg's writing model (1996) contains three phases: *formulation*, *execution*, and *monitoring*. In formulation, writers set the goals of the text and organize the ideas (*planning*), and lexical and syntactic forms are selected for encoding messages (*translating*). Execution consists of *programming*, in which writers convert their chosen form into typing or handwriting, and *executing*, in which writers move their hands to write. Monitoring consists of *reading*, where writers read the text, and *editing*, where writers check for text organization or linguistic errors. The formulation process takes priority over execution and monitoring since the central executive, which is one of the components of working memory and is involved in formulation and monitoring, has limited capacity (Kellogg, 1996). Johnson, Mercado, and Acevedo (2012) claim that both planning and translating in the formulation stage compete for working memory resources while writing. For instance, if learners use up processing to find lexical items, their attention to grammar will be limited. When Kellogg's model is applied to L2 writers, a great deal of demanding writing will be conducted due to several factors, depending on L2 proficiency, pressure on working memory, limited L2 linguistic resources, difficulty in accessing the resources, and L1 dependence when planning, translating, and editing. Moreover, Ellis and Yuan (2004) argue that Kellogg's "planning" is equivalent to Levelt's conceptualizer, "translating" is similar to Levelt's formulation, and "execution" is similar to articulation. However, writing differs from speaking in terms of the time spent. L2 speakers must produce the language in real time which leads to greater anxiety, whereas L2 writers can control the time they spend on formulation and monitoring.

2.2. Online Planning

2.2.1. Classification of online planning

Ellis (2005, 2009) classified planning into pre-task planning and online planning. Pre-task planning occurs before the task is performed, during which time the learners prepare ideas/information for the content and organize the method of delivering that content. However, online planning occurs while the task is being performed, and it entails *pressured online planning*, which should be conducted while performing the task rapidly, and *unpressured online planning* in which planning is conducted while performing the task for an unlimited time. Since pressured online planning is the same condition as *no planning* in which both pre-task planning and unpressured online planning are restricted, most online planning studies have used the unpressured online planning condition (see Table 1).

TABLE 1
Online Planning Conditions

Online Planning	Spoken Tasks	Written Tasks
Pressured Online Planning (No Planning)	(a) Limited fast time spent while performing the task	(c) Limited fast time spent while performing the task
Unpressured Online Planning	(b) Unlimited time spent while performing the task	(d) Unlimited time spent while performing the task

However, online planning in the present study is a modified version of unpressured online planning. While unpressured online planning in previous studies has provided learners with unlimited time to speak or write, the present study provides an extended and longer amount of time, which was carefully set by the pilot study, in the spoken and written tasks, and all participants were assigned to use the total amount of time to speak and write. Moreover, revising the text, particularly in the written task, was restricted.

2.2.2. Previous online planning studies in spoken and written tasks

The effects of pre-task planning on CAF have been examined widely both in L2 spoken tasks (e.g., Crookes, 1989; Elder & Iwashita, 2005; Foster & Skehan, 1996, 1999; Gilabert, 2007; Kawauchi, 2005; Sangarun, 2005; Tavakoli & Skehan, 2005; Wang, 2009; Yuan & Ellis, 2003) and L2 written tasks (e.g., Ellis & Yuan, 2004; Salimi & Fatollahnejad, 2012). The most widely cited studies have been those that compare pre-task planning and no planning conditions in spoken tasks (e.g., Crookes, 1989; Tavakoli & Skehan, 2005) or written tasks (e.g., Salimi & Fatollahnejad, 2012). Pre-task planning has generally demonstrated a beneficial effect on the increase in fluency and trade-off effects between complexity and accuracy (e.g., Bei, 2010; Crookes, 1989; Ellis & Yuan, 2004; Foster & Skehan, 1996; Wendel, 1997) since pre-task planning supports the conceptualization process in speaking and the planning process in writing (Ellis & Yuan, 2004).

However, the effects of online planning on CAF have rarely been investigated in L2 spoken tasks (Ahmadian, 2012; Ellis & Yuan, 2005; Wang, 2009; Yuan & Ellis, 2003) and L2 written tasks (Ellis & Yuan, 2004, 2005). Comparing pre-task planning, online planning, and no planning is rare in spoken tasks (Wang, 2009; Yuan & Ellis, 2003) and in written tasks (Ellis & Yuan, 2004). In addition, to my knowledge, there is only one comparative study of online planning (unpressured and pressured online planning) between spoken and written tasks (Ellis & Yuan, 2005). The following Table 2 shows previous online planning-related studies in L2 spoken and written tasks. Online planning studies show inconsistent and unclear findings.

In terms of Ahmadian (2012), 45 intermediate English as a foreign language (EFL) learners were divided into three groups for the oral narrative task: the pressured online

planning group ($n = 15$), unguided unpressured online planning group ($n = 15$), and guided unpressured online planning ($n = 15$) group. The pressured online planning condition is the same as the no planning condition where a fast and pressured time for performing the oral task was given (8 minutes). This fast and pressured time was previously set by a pilot study, as suggested by Yuan and Ellis (2003). For both the unpressured online planning conditions, the participants were told that they could use as much time as they required when telling a story after watching a silent video.

TABLE 2
Online Planning Studies in Spoken and Written Tasks

Planning (Modality)	Author(s) (Year)	Task & Conditions	Findings
Online p. (Speaking)	Ahmadian (2012)	Narrative Tasks: 1) Guided unpressured online p. 2) Unguided unpressured online p. 3) Pressured online p. (Intermediate)	- Syntactic Complexity: Guided and unguided unpressured online p. > Pressured online p. - Accuracy: Guided unpressured online p. > Two others - Fluency: Pressured online p. > Both unpressured online p.
Pre-task p. Online p. (Speaking)	Yuan & Ellis (2003)	Planning: 1) No planning 2) Pre-task planning 3) Unpressured online p.	- Pre-task and online p. led to syntactic complexity than no p. - Pre-task p. led to higher lexical variety than online p. - Online planning led to greater accuracy than no p. - Pre-task planning led to greater fluency than no p. or online p.
Pre-task p. Online p. (Writing)	Ellis & Yuan (2004)	Narrative Tasks: 1) No planning 2) Pre-task planning 3) Unpressured online p.	- Syntactic Complexity: No effect - Syntactic Variety: Pre-task p. > No p. - Lexical Variety: No effect - Accuracy: Online p. > Pre-task p., No p. (strong trend only in error-free clause, $p = .059$) - Fluency: Pre-task p. > No p., Online p.
Pre-task p. Online p. (Speaking)	Wang (2009)	Narrative Tasks: 1) No planning 2) Pre-task planning 3) Unpressured online p. Online planning is controlled by slowed version of video.	- Pre-task planning led to either complexity or fluency in different conditions. - "Pure" unpressured online p. did not lead to greater CAF. - Unpressured online planning after watching video led to greater complexity and accuracy.

Online p. (Speaking) (Writing)	Ellis & Yuan (2005)	Online Planning: 1) Unpressured online p. 2) Pressured online p. Modality & Task: a) Oral narrative task b) Written narrative task	Planning Conditions: - Syntactic Complexity: Unpressured p. > Pressured p. - Lexical Complexity: Unpressured p = Pressured p. - Accuracy: Unpressured p. > Pressured p. - Fluency: Unpressured p. = Pressured p. Modality - Syntactic Complexity: Writing > Speaking (Only in pressured p.) - Lexical Complexity: Writing > Speaking - Accuracy: Writing > Speaking - Fluency: Speaking > Writing
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Note. p. = planning; (Intermediate) = If proficiency level of participants is stated or known in the previous study, the level is given here. If not, there is no information here.

The difference between unguided and guided unpressured online planning was that the latter group received a handout showing the rules for appropriate English articles (target English for accuracy) prior to watching the video. Guided unpressured online planning could be a similar condition to the pre-task planning and unpressured online planning conditions, since grammatical rules were given to the participants before the oral task. Thus, the findings focusing on unguided unpressured online planning were that both the unpressured online planning groups gained complexity but their fluency decreased compared to the no planning group. The unguided unpressured online planning and no planning groups' accuracy decreased compared to the guided unpressured online planning group. Thus, unguided unpressured online planning demonstrated a positive effect solely on complexity, entailing syntactic complexity and syntactic variety.

Yuan and Ellis (2003) compared three planning conditions in the oral narrative task: no planning, pre-task planning, and unpressured online planning. The participants comprised 42 Chinese EFL learners who were divided into three groups: the no planning (NP) group, pre-task planning (PTP) group, and online planning (OLP) group. In terms of the pilot study, 5 minutes were set as the time for fast and pressured oral performance. All three groups were given 30 seconds to view all the pictures and the NP group then had to finish telling the story within 5 minutes. For the PTP group, 10 minutes were allotted for the pre-task planning time before telling the story within 5 minutes, while the OLP group was given unlimited time to tell the story. The findings were that pre-task planning led to greater syntactic complexity, lexical variety, and fluency compared to no planning or/and

online planning, whereas online planning improved syntactic complexity and accuracy compared to no planning. Yuan and Ellis suggested that when L2 learners are allowed to engage in online planning, it provides them with additional opportunity to access formulation, thus leading to improved complexity and accuracy.

The same authors (Ellis & Yuan, 2004) investigated the same conditions in the written narrative task. In their study, 42 Chinese EFL learners were divided into the NP, PTP, and OLP groups. As a result of the pilot study, 17 minutes were set for the rapid writing time. The NP group had to write a story of at least 200 words while looking at the pictures within 17 minutes, while the PTP group had to write a story with at least 200 words within 17 minutes after 10 minutes of planning time. During this time, each participant was given a sheet of paper for pre-task planning. The OLP group was not asked to write at least 200 words and their writing time was unlimited. The results demonstrated that pre-task planning enhanced syntactic variety and fluency compared to no planning or/and online planning, but online planning increased accuracy compared to no planning and pre-task planning. Neither syntactic complexity nor lexical variety demonstrated a significant effect on any planning condition.

To sum up, unpressured online planning led to greater syntactic complexity (Ahmadian, 2012) or syntactic complexity and accuracy (Yuan & Ellis, 2003) in the spoken tasks. Unpressured online planning improved accuracy (Ellis & Yuan, 2004) in the written tasks. Therefore, based on three previous studies, online planning in general improves syntactic complexity in speaking but improves accuracy in writing.

2.2.3. Challenges in online planning

As seen in the above, online planning has faced empirical and methodological challenges. Firstly, and very importantly, the unpressured online planning condition must be carefully reconsidered. Skehan, Xiaoyue, Qian, and Wang (2012, p. 174) claimed that the online planning condition is problematic because “online planning is not based on any direct evidence.” When comparing no planning (pressured online planning) with online planning, no planning has been set based on the fast performance time in the pilot study, but in the online planning condition, participants are told to use as much time as they require. Motivated by the suggestion that pressured and unpressured online planning may not differ merely by directing participants to use unlimited time in a spoken task, Wang (2009) created a modified version of the online planning condition in oral narrative tasks. She created a 60% slower version of a *Mr. Bean* video using a video-editing software program and set six different planning conditions: 1) control (watching the video and telling the story simultaneously), 2) watched (watching the video and then watching and telling simultaneously), 3) watched and strategic (watching the video, then having time to plan,

and then watching and telling simultaneously), 4) (pure) online planning (watching a slowed down version of the video and telling the story simultaneously), 5) watched online planning (watching the video and then watching a slowed down version of the video and telling simultaneously), and 6) task repetition (watching and telling simultaneously and then repeating it) groups. The surprising findings were that none of the pure online planning conditions improved CAF. However, the watched online planning group enhanced both their complexity and accuracy. In other words, “under carefully controlled time-pressure conditions, online planning alone does not lead to significant differences from the control group. However, online planning clearly does have an effect, but it appears something more is needed to trigger its effectiveness” (p. 176). Wang concluded that the “watched” condition supports conceptualizer operation while the online planning part supports the formulator’s processing. Therefore, through carefully designed methods, the pure effects of online planning on CAF can be found in the spoken task.

In my previous study (Kim, 2017), a modified version of online planning in writing was first introduced since “it is difficult to confirm writing is performed either in a fast or slow condition, and there is a possibility of revising the text after performing the task” (p. 38), particularly in written tasks. A total of 421 Korean EFL learners were divided into six groups based on their English proficiency level and planning conditions: 1) intermediate no planning, 2) intermediate pre-task planning, 3) intermediate online planning, 4) advanced no planning, 5) advanced pre-task planning, and 6) advanced online planning groups. For the no planning (NP) conditions, the participants had to write a story of more than 10 lines within 11 minutes, which was set based on the pilot study writing. For the pre-task planning (PP) conditions, 10 minutes were allotted for planning and participants were then asked to write a story of more than 10 lines within the same 11 minutes. For the online planning (OP) conditions, the participants were asked to complete the story within 25 minutes, which is a modified version of the online planning condition suggested by Ellis and Yuan (2004, 2005). Instead of giving unlimited time as a direction, a longer time (25 minutes) was assigned and it was stressed that the participants should use the whole time. Moreover, they were not allowed to reread the whole story or revise the text once they had completed the story. The findings were that, in intermediate proficiency groups, no planning improved accuracy, pre-task planning led to fluency, and online planning increased syntactic complexity. The interesting point was that online planning did not increase accuracy since there was no opportunity to revise once they had finished writing the whole story. Advanced learners’ planning did not produce a significant difference in CAF (only one measure of fluency improved significantly). Thus, planning plays a compensatory role to the limited attentional capacity of intermediate L2 learners, and different planning conditions lead to different accessing of writing processing operations, resulting in different manipulation of linguistic performance, CAF. Therefore, the present

study also used a modified version of the online planning condition as previously suggested by Kim (2017). Additionally, this online planning condition was applied to both spoken and written tasks.

Secondly, besides considering online planning conditions, online planning in different modalities (i.e., speaking and writing) should also be considered. The study by Ellis and Yuan (2005) compared the unpressured online planning (ONP) and no planning (NP) conditions both in L2 speaking and writing (see Tables 1 and 2). Forty-two Chinese EFL learners were divided into three groups: Group 1 (NP in the oral task, OLP in the written task), Group 2 (OLP in the oral task), and Group 3 (NP in the written task). The findings were that in terms of planning conditions, the OLP groups had greater syntactic complexity and accuracy than the NP groups, yet lexical complexity and fluency did not demonstrate any significant effect between the NP and OLP groups. In terms of modality, writing induced better syntactical complexity, lexical complexity, and accuracy than speaking while speaking demonstrated greater fluency than writing. Ellis and Yuan (2005) suggested two limitations of their study: the same group did not perform the oral and written tasks under both conditions, and the oral and written tasks were not the same although the task complexity was equivalent.

Kormos and Trebits (2012) argued that “writers are under somewhat less pressure than speakers to divide their attention between conceptualizing their message and linguistically encoding it” (p. 446). In other words, written tasks possibly include more changes of online planning while writing compared to spoken tasks, although the same unlimited time was assigned to L2 learners (as seen in (b) and (d) conditions in Table 1). Theoretically, the unpressured online planning was set to ensure sufficient time to plan the performance of the tasks. However, despite allotting unlimited time to perform the tasks, most online planning in speaking would be pressured while most online planning in writing would be unpressured. The ambiguous distinction between the theoretical assumption and practical reality in terms of online planning may lead to less reliable and valid results. Moreover, Skehan et al. (2012, p. 175) argued that there is no information regarding whether the participants used “all of the time that was allocated to them” in online planning. Researchers may ascertain when online planning finishes by the time the spoken tasks finish, yet silent online planning may not be easily distinguished within non-verbal writing and the total amount of time spent on writing and online planning is difficult to control. Additionally, there is a possibility of revising the text after completing the written tasks. These methodological variables should be controlled evenly in both online planning of speaking and writing, and thus the effect of task modality on CAF in two planning conditions will be examined clearly.

Thirdly, most planning studies have been conducted with learners whose proficiency level was only vaguely set (Ellis, 2009) or without careful consideration of proficiency

level (Kim, 2017). As Ellis (2009) argued, “future planning studies need to provide more explicit definitions of proficiency” (p. 493). There are few online planning studies that consider proficiency (e.g., Ahmadian, 2012). In Ahmadian’s (2012) study, the participants’ language was tested by the grammar section of the *Oxford Placement Test 2*. When the participants obtained scores between 49 and 62, they were assigned as intermediate level learners. This proficiency assigning test (grammar test) may have less relation to the main task (oral narrative task). Thus, for a more detailed proficiency level, the present study screened the L2 learners twice through a college placement test and proficiency-assigning task. Carefully selected intermediate L2 learners participated in the study.

Therefore, motivated by previous studies and the gap in their research, the present study provided the following characteristics: 1) a newly introduced online planning condition, 2) online planning in both speaking and writing, 3) using the same narrative task in speaking and writing, and 4) explicit proficiency. The present study seeks to examine the effect of online planning on CAF in both spoken and written tasks, with the aim of answering the following two research questions.

1. What effects do no planning and online planning have on complexity, accuracy, and fluency in the spoken and written tasks?
2. What effects does task modality have on complexity, accuracy, and fluency?

3. METHODS

This study was conducted with a 2x2 design consisting of the proficiency assigning task and main task (either spoken or written) in an experimental setting. There were two independent variables: 1) planning (no planning and online planning) and 2) task modality (speaking and writing). The dependent variables comprised complexity, accuracy, and fluency. Before collecting the data, the researcher of the present study received training at an Institutional Review Board (IRB) workshop and all documents and the proposal to protect participants’ human rights for the present study were reviewed and approved by the IRB members.

3.1. Participants and Setting

The participants comprised 80 Korean EFL undergraduates (37 freshmen, 20 sophomores, 10 juniors, and 13 seniors) majoring in diverse areas at one university in Seoul, South Korea. All participants were female with an average age of 20.7 years. The participants had learned English in instructed settings. At the time of data collection, they

had been learning English in Korean schools for at least 11 years, both in school (from elementary to middle and high schools and then in college) or/and in private language institutes. They had had little opportunity to speak English outside of the classroom. The participants participated voluntarily in the study.

Based on the previous study (Kim, 2017), only undergraduates at intermediate proficiency level, who had achieved Level 2 (among three possible levels from Level 1 (novice) to Level 3 (advanced)) on the college placement test called the General English Language Test (GELT) within 6 months, were recruited. The participants came individually to the classroom at the appointed time with the researcher and then performed two tasks (proficiency assigning task and randomly assigned main task (either the spoken or written task)) in an experimental setting. The 80 participants were divided into four groups in the study: the no planning (NP) in speaking group (SNP, $n = 20$), online planning (OP) in speaking group (SOP, $n = 20$), no planning in writing group (WNP, $n = 20$), and online planning in writing group (WOP, $n = 20$). After performing the two tasks, the participants' background information and consent form were completed. In terms of the proficiency assigning task, five participants were set as advanced learners and were therefore excluded from the final data. Thus, the final number of participants whose data were used in the present study comprised 75 Korean EFL learners.

3.2. Proficiency Assigning Task

The proficiency assigning task comprised an oral narrative task which played several roles. 1) It controlled the more detailed intermediate level of the participants. Although only intermediate proficiency participants (Level 2) as assigned by the GELT joined the study, a more refined and detailed intermediate level of English was required in the study, as proposed by Ellis (2009). 2) By using the same genre of narrative task, the participants might warm up their speaking and become familiar with the genre. 3) Since approximately two minutes were allotted to tell their own experience, they could practice their timed performance before the main task.

Four different topics were assigned in the proficiency assigning task: one memorable experience, one unforgettable trip, a special memory with one person, and a special moment last year. Among the four suggested topics, which were written both in English and Korean, each participant had to choose one and they were then asked to tell their story in the past for at least two minutes. While recording their telling of the story, they could see the timer in front of them. They were not allowed to make any note or memo before the task. After finishing the task, the participants were assigned to one of four different groups (SNP, SOP, WNP, and WOP) for the main task. Upon completing all tasks, the participants' oral speaking proficiency levels were rated by the researcher and a native English-speaking

rater using the public version of the American Council on the Teaching of Foreign Languages (ACTFL) proficiency guideline. Two raters decided on numbers from 1 to 5 (1 = Novice High, 2 = Intermediate Low, 3 = Intermediate Mid, 4 = Intermediate High, 5 = Above Advanced Low) since the participants' proficiency levels had already been filtered through the GELT (Level 2). If the assigned proficiency level differed in more than two points between the two raters, they conferred through discussion to reach agreement. Finally, five participants were excluded from the main data as their levels were too advanced. Through the GELT and proficiency assigning task (oral narrative task), intermediate level participants were carefully selected and participated in the present study.

3.3. Main Tasks

3.3.1. Main task materials

The main task material in the spoken and written tasks comprised a story based on a series of eight pictures from Yule (1997). Picture-based narrative tasks have a number of benefits. Firstly, the tasks draw learners' attention to meaning rather than form, which is a crucial part of task-based research. Secondly, the same task had been used in many previous studies (Ellis & Yuan, 2004; Ishikawa, 2006; Yuan, 2001), and thus the findings would be more reliable and comparable with other studies. Lastly, the stories might have greater processing demands in terms of the learners' linguistic encoding, but conceptualization processing might be less demanding (Kormos & Trebits, 2012).

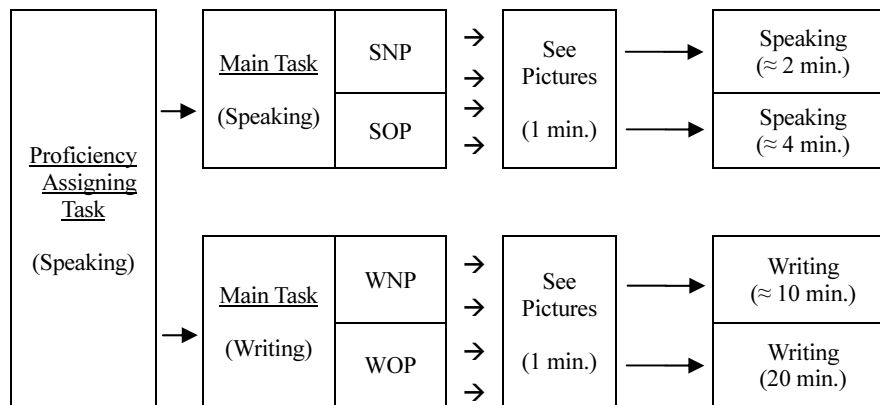
The story was supposed to have occurred in the previous week and the set of eight pictures followed a chronological order. The story was about a woman who had gone to the supermarket the previous week. At the supermarket, she bumped into one of her friends and her friend's son. The two women were busy talking and did not notice that the boy had taken a bottle of wine and put it into the woman's bag. After talking, the woman went out alone without paying for the wine since she did not know about it. Eventually, she was caught and arrested by a security man and a police officer. This story has been popularly used in other planning studies (e.g., Ishikawa, 2006).

3.3.2. Task conditions and procedure

The main task required participants to speak or write a story. The main task procedure in the four groups (SNP, SOP, WNP, and WOP) after the proficiency assigning task is shown in Figure 1. In the SNP condition, the participants were asked to view eight pictures for 1 minute. While viewing the pictures, no notes or memo were permitted on the paper. The participants were then required to tell the story within two minutes. This fast and pressured

time (2 min.) for speaking was set based on a previous pilot study following Ellis and Yuan's (2004) study. In order to complete the story, this condition required pressured and rapid speaking.

FIGURE 1
Procedure of Tasks



In the SOP condition, as in the SNP condition, the participants were required to view pictures for 1 minute and then to tell the story for at least 4 minutes. They were required to use up the full 4 minutes. The time allotted was double that allotted under the SNP condition, and they had ample time to elaborate the story. This time was set based on the pilot study before the present study.

In the WNP condition, the participants were told to look at eight pictures for the same 1 minute. The participants were then told to write the story on paper in more than 10 lines within 10 minutes. This fast and pressured time (10 min.) for writing was also previously set by the pilot study. The more specific procedure of the pilot study has been detailed in the previous study (Kim, 2017). Rapid and pressured writing was expected in this condition.

In the WOP condition, as in the WNP condition, after viewing the pictures for 1 minute, the participants were requested to finish writing within 20 minutes. They were asked to write more than 10 lines and to use up the full 20 minutes, which meant that they could not finish the story before the 20 minutes were up. They were also required not to revise the full text if they finished the story earlier than the 20 minutes, although they could revise while writing the text.

Except for the WOP condition in which exactly 20 minutes were used up, in the SNP (within 2 minutes), SOP (at least for 4 minutes), and WNP (within 10 minutes) conditions,

the researcher noted the real time spent by individual participants for the task performance. In Figure 1, the sign \approx means that the exact time might differ slightly depending on different participants, despite the directions they were given. In addition, in all conditions, the directions were written and explained in their L1, Korean, and the same prompt “Last week...” was provided. The use of a dictionary was not allowed and the timer was set and located in front of each participant.

3.4. Measures and Analysis

The measures of linguistic performance, syntactic complexity, accuracy, and fluency were used to evaluate the effects of different planning from the transcribed spoken and written texts. In the present study, one of the dependent variables, complexity, means syntactic complexity as used in other studies (e.g., Mehnert, 1998; Skehan & Foster, 2005; Wang, 2009; Yuan & Ellis, 2003). Table 3 shows the summary of task performance measures of CAF.

TABLE 3
Summary of Task Performance Measures

Syntactic Complexity	Accuracy	Fluency
Clause/T-unit (C/T)	Errors/T-unit (E/T)	Words/Minutes (W/M)
Dependent Clause/Clause (DC/C)	Verb-related Error/T-unit (VE/T)	--
--	Error-free T-unit/T-unit (EFT/T)	--

For complexity, clause (C), dependent clause (DC), and T-unit (T) were detected as basic units. In fact, Tarone (1985) claimed that the T-unit is inadequate to deal with spoken data with few complete sentences and hesitation. However, in my previous study (Kim, 2017) and the pilot study, the Level 2 participants did not use incomplete sentences or frequent repetition when speaking, and thus the T-unit was used in this study since this is the most popular unit for analysis of both spoken and written data, as Foster, Tonkyn, and Wigglesworth (2000) found in their survey. In the study, a clause includes independent and dependent clauses, and a dependent clause has a finite (e.g., noun clause, relative clause, adverbial clause, direct quotations, and appositive clause) or non-finite verb (e.g., non-finite adverbial clause and non-finite adjective clause). A T-unit is defined by Hunt (1965) as at least one independent clause with/without subordinate clauses attached or embedded in it. For instance, a simple sentence, complex sentence, or appositive sentence is counted as one T-unit, yet a compound sentence is counted as two T-units. However, back-channel or boundary markers are not counted as T-units. The researcher counted three units twice. Syntactic complexity was then analyzed by the ratio of clauses per T-unit (C/T) and the ratio of dependent clauses per clause (DC/C).

For accuracy, the number of errors (E), verb-related errors, and error-free T-units were found and underlined as basic units by the researcher and a native English-speaking rater. In the study, errors included morphosyntactic errors and lexical errors. If there was no agreement between the two raters, they conferred and came to an agreement. Accuracy was then analyzed by the ratio of errors per T-unit (E/T), the ratio of verb-related errors per T-unit (VE/T), and the ratio of error-free T-units per T-unit (EFT/T).

For fluency, the number of words and the total time spent on the main task were counted and fluency was then analyzed by the number of words per minute. After analyzing all the data, an independent sample t-test and a series of one-way analyses of variance (ANOVA) were performed using the Statistical Package for Social Sciences (SPSS). The alpha for obtaining statistical significance was set at .05.

4. RESULTS

4.1. The Effects of Planning on CAF in L2 Spoken and Written Tasks

The first research question concerns the effects of planning on CAF in the spoken and written tasks. In the L2 spoken task, the two planning conditions (no planning and online planning) demonstrated different effects on complexity, accuracy, and fluency. Table 4 indicates the effects of the two planning conditions, no planning and online planning, on CAF in the L2 spoken task.

TABLE 4
The Effects of Planning in L2 Spoken Task

Measures	Planning	<i>M</i>	<i>SD</i>	<i>t</i>	<i>Sig.</i>
C/T	NP	1.54	.22	1.007	.321
	OP	1.48	.19		
DC/C	NP	.34	.08	1.060	.296
	OP	.31	.09		
E/T	NP	.75	.32	-2.381*	.023
	OP	1.01	.35		
VE/T	NP	.55	.25	-2.378*	.023
	OP	.74	.27		
EFT/T	NP	.50	.19	2.707**	.010
	OP	.36	.14		
W/M	NP	88.50	22.70	3.863***	.000
	OP	64.04	16.50		

Note. * $p < .05$; ** $p < .01$; *** $p < .001$; C/T and DC/C = syntactic complexity measures; E/T, VE/T, and EFT/T = accuracy measures; W/M = fluency measure; NP = no planning; OP = online planning.

Considering syntactic complexity, the NP group and OP group demonstrated no significant difference, which means that neither no planning nor online planning affected the participants' syntactic complexity in linguistic performance in speaking. In terms of accuracy, the NP group significantly outperformed the OP group in E/T ($M = 0.75$ in NP, $M = 1.01$ in OP, $p < 0.05$), in VE/T ($M = 0.55$ in NP, $M = 0.74$ in OP, $p < 0.05$), and in EFT/T ($M = 0.50$ in NP, $M = 0.36$ in OP, $p < 0.01$). This means that when the participants performed the spoken task without planning, their linguistic performance was significantly more accurate than when they engaged in online planning in terms of the proportion of errors, verb-related errors, and error-free T-units. In terms of fluency, the NP group were significantly greater than the OP group in W/M ($M = 88.50$ in NP, $M = 64.04$ in OP, $p < 0.001$). When the participants engaged in no planning, their linguistic performances tended to be more fluent than when they engaged in online planning.

On the other hand, in the L2 written task, the two planning conditions demonstrated different effects on complexity, accuracy, and fluency. Table 5 shows the effects of the two planning conditions, no planning and online planning, on CAF in the L2 written task.

TABLE 5
The Effects of Planning in L2 Written Task

Measures	Planning	<i>M</i>	<i>SD</i>	<i>t</i>	<i>Sig.</i>
C/T	NP	1.60	.28	.929	.359
	OP	1.53	.16		
DC/C	NP	.36	.12	.558	.581
	OP	.34	.07		
E/T	NP	.60	.33	-1.621	.114
	OP	.78	.34		
VE/T	NP	.29	.20	-1.403	.170
	OP	.37	.17		
EFT/T	NP	.54	.22	.390	.699
	OP	.51	.14		
W/M	NP	15.11	4.19	2.885**	.007
	OP	11.83	2.41		

Note. ** $p < .01$; C/T and DC/C = syntactic complexity measures; E/T, VE/T, and FET/T = accuracy measures; W/M = fluency measure; NP = no planning; OP = online planning.

In the L2 written task, the NP group and OP group showed no significant difference in either syntactic complexity or accuracy. Considering fluency, the NP group significantly outperformed the OP group in W/M ($M = 15.11$ in NP, $M = 11.83$ in OP, $p < 0.01$). When the participants wrote the story without planning, their linguistic performance was more fluent than when they engaged in online planning.

4.2. The Effects of Task Modality on CAF in the Two Planning Conditions

The second research question concerns the effects of task modality (i.e., the spoken and written tasks) on CAF in the different planning conditions. In the no planning condition, each task modality (speaking and writing) demonstrated different effects on CAF. Table 6 shows the effects of task modality, speaking and writing, on CAF in the no planning condition.

TABLE 6
The Effects of Modality of Tasks in No Planning Condition

Measures	Task	<i>M</i>	<i>SD</i>	<i>t</i>	<i>Sig.</i>
C/T	Speaking	1.54	.22	-.646	.523
	Writing	1.60	.28		
DC/C	Speaking	.34	.08	-.416	.680
	Writing	.36	.12		
E/T	Speaking	.75	.32	1.456	.154
	Writing	.60	.33		
VE/T	Speaking	.55	.25	3.443**	.002
	Writing	.29	.20		
EFT/T	Speaking	.50	.19	-.515	.610
	Writing	.54	.22		
W/M	Speaking	88.50	22.70	13.489***	.000
	Writing	15.11	4.19		

Note. ** $p < .01$; *** $p < .001$; C/T and DC/C = syntactic complexity measures; E/T, VE/T, and FET/T = accuracy measures; W/M = fluency measure.

In the no planning condition, neither the spoken nor written tasks demonstrated any significant difference in terms of syntactic complexity, but they did show a significant difference in accuracy (one measure among three) and fluency. The L2 written performance was much more accurate than the L2 spoken performance in VE/T ($M = 0.55$ in speaking, $M = 0.29$ in writing, $p < 0.001$) and the written task generally tended to be more accurate in other measures of accuracy (E/T and EFT/T) in terms of mean difference. However, the L2 spoken performance was significantly more fluent than the L2 written task in W/M ($M = 88.50$ in speaking, $M = 15.11$ in writing, $p < 0.001$). When the participants did not plan previously or while performing either of the spoken or written tasks, their writing was more accurate than their speaking while their speaking was more fluent than their writing.

On the other hand, in the online planning condition, both task modalities also demonstrated different effects on complexity, accuracy, and fluency. Table 7 indicates the effects of task modality, speaking and writing, on CAF in the online planning condition. In the online planning condition, neither the spoken nor written tasks demonstrated a difference in syntactic complexity, whereas the two task modalities did demonstrate a

TABLE 7

The Effects of Modality of Tasks in Online Planning Condition

Measures	Task	<i>M</i>	<i>SD</i>	<i>t</i>	<i>Sig.</i>
C/T	Speaking	1.48	.19	-.820	.418
	Writing	1.53	.16		
DC/C	Speaking	.31	.09	-.925	.361
	Writing	.34	.07		
E/T	Speaking	1.01	.35	.683*	.045
	Writing	.78	.34		
VE/T	Speaking	.74	.27	.117***	.000
	Writing	.37	.17		
EFT/T	Speaking	.36	.14	.973**	.002
	Writing	.51	.14		
W/M	Speaking	64.04	16.50	.000***	.000
	Writing	11.83	2.41		

Note. * $p < .05$; ** $p < .01$; *** $p < .001$; C/T and DC/C = syntactic complexity measures; E/T, VE/T, and EFT/T = accuracy measures; W/M = fluency measure.

significant difference in accuracy (all three measures) and fluency. The L2 written performance was significantly more accurate than the spoken performance in E/T ($M = 1.01$ in speaking, $M = 0.78$ in writing, $p < 0.05$), in VE/T ($M = 0.74$ in speaking, $M = 0.37$ in writing, $p < 0.001$), and in EFT/T ($M = 0.36$ in speaking, $M = 0.51$ in writing, $p < 0.01$). When the participants were involved in online planning, their written performance had a much lower proportion of errors and verb-related errors than their spoken performance, while the proportion of error-free T-units was also greater in the written task than in the spoken task. However, the L2 spoken performance was significantly more fluent than the L2 written task in W/M ($M = 64.04$ in speaking, $M = 11.83$ in writing, $p < 0.001$). When the participants did not plan previously or while performing either of the spoken or written tasks, their spoken performance was more fluent than their written performance.

TABLE 8

The Summary of the Findings

CAF	Measures	In Speaking	In Writing	In No Planning	In Online Planning
Syntactic Complexity	C/T	--	--	--	--
	DC/C	--	--	--	--
Accuracy	E/T	NP > OP	NP \supset OP	--	W > S
	VE/T	NP > OP	--	W >> S	W >>> S
	EFT/T	NP >> OP	--	--	W >> S
Fluency	W/M	NP >>> OP	NP >> OP	S >>> W	S >>> W

Note. > = when the p value was significantly less than 0.05; >> = when the p value was significantly less than 0.01; >>> = when the p value was significantly less than 0.001; \supset = when the p value was 0.114; NP = no planning; OP = online planning; S = speaking; W = writing.

To sum up, the overall summary of the findings of the effects of planning and task

modality on CAF in the present study are presented in Table 8 above in which statistically significant (or strong) findings are provided.

5. DISCUSSION AND CONCLUSION

The research questions of the present study were as follows: 1) “What effects do no planning and online planning have on complexity, accuracy, and fluency in the spoken and written tasks?” and 2) “What effects does task modality have on complexity, accuracy, and fluency?” As seen in Table 8 above, the main findings were that no planning led to greater accuracy and fluency than online planning in the spoken task, and no planning led to greater fluency than online planning in the written task. Additionally, the written performance was more accurate than the spoken performance in both the no planning and online planning conditions (in only one measure of accuracy in the no planning condition and in all measures of accuracy in the online planning condition). The spoken performance was more fluent than the written performance in both planning conditions.

In terms of no planning, this condition increased both accuracy and fluency in speaking and fluency in writing. In many planning studies (e.g., Ellis & Yuan, 2004), no planning has been defined as the condition under which both pre-task planning and online planning are theoretically restricted. However, in the actual experiments, L2 learners tended to plan to speak or write if possible while looking at the pictures or performing the tasks. In the present study, during the 1 minute allotted to view the pictures, the participants possibly tended to plan before performing the tasks. In terms of Mehnert’s (1988) study, there were four groups: the no planning (15 seconds were allotted to read the task instruction before speaking), 1-minute pre-task planning (after 15 seconds, 1 minute was allotted for planning before speaking), 5-minute pre-task planning, and 10-minute pre-task planning groups. The results were that when the learners had 1 minute to plan, “their priority was given to accuracy” (p. 104) but, interestingly, accuracy did not improve with more pre-task planning time. In a similar vein, the present study also demonstrates that no planning improved accuracy more than online planning in the spoken task, and a similar tendency was observed between no planning and online planning in the written task. In the previous study (Kim, 2017), the intermediate participants in the no planning condition significantly increased their accuracy compared to online planning or/and pre-task planning in the written task. As possible reasons, intermediate learners’ tendency to focus on accurate linguistic form, lack of time to use L1, which may hinder L2 accuracy, and less restricted written performance compared to spoken performance were suggested. Additionally, as one of the limitations of the previous study, a more careful design of the no planning condition was suggested. The present study set the time for participants to view the pictures at only 1

minute, which is a much shorter time in which to view the pictures than the previous study; thus, the possibility of planning in advance was intended to be more limited. In this condition, the participants may focus their attention more on accurate linguistic form during a limited time. This tendency is stronger in a more time-restricted spoken task than in the written task. Moreover, the increase of fluency in the no planning condition in both the spoken and written tasks demonstrates that a simple and quick decision to create a story content for a short time would lighten the participants' load of conceptualization (in speaking) and planning process (in writing), thus allowing them to speak and write the story faster than when they were involved in online planning. Similar results were found in Ahmadian's (2012) study. In the spoken task, the no planning condition improved the participants' linguistic fluency more than the unpressured online planning condition. Thus, when planning is constrained and the task modality is pressured (i.e., speaking), L2 learners tend to give their attentional resources to formulation by simplifying the conceptualization process. A simple story and less content elaboration may allow L2 learners to pay more attention to flawless and error free linguistic performance.

In terms of online planning, although a longer time was given both in the spoken and written tasks, the need to create and organize a more specific storyline might not free the conceptualizer (in speaking) and planning (in writing). While performing the tasks, using both conceptualizer and formulator (in speaking) and planning and translating (in writing) might prove a large burden to intermediate L2 learners, thus leading to a decrease in accuracy and fluency in both tasks. The trade-off between fluency (meaning) and accuracy (form) was much greater in the time-restricted spoken task than in the written task. In previous studies, L2 learners were assigned unlimited time to speak (Yuan & Ellis, 2003) and write (Ellis & Yuan, 2005). Both studies found that both complexity and accuracy improved through unpressured online planning. Contrarily, in Wang's (2009) study, so-called "pure" online planning did not affect any CAF in the spoken task, whereas the online planning condition combined with watching the video has previously improved both complexity and accuracy, as in Yuan and Ellis's (2003) study. When comparing my previous study (Kim, 2017) and the present study in the written tasks, online planning with a little longer advance time to view the pictures increased syntactic complexity. However, online planning with a limited time (1 min.) to view the pictures did not increase syntactic complexity. Wang (2009) argued that online planning has a clear function in CAF, yet it needs to be triggered by others. Watching the video before narrating the slowed down video story might be such a trigger and a little longer advance time to view the pictures (Kim, 2017) might trigger increased syntactic complexity. The present study provided "pure" online planning without a longer time before the task and unlimited time while performing the task. In this case, the pure online planning did not affect either syntactic complexity or accuracy. Moreover, it decreased fluency compared to the no planning

situation since the need to tell and elaborate a specific storyline might prove a burden in the conceptualization and planning process. These results are the same as in Wang's (2009) study. In order to manipulate linguistic performance by (pure) online planning, the load for meaning (conceptualizer in speaking and planning in writing) needs to be free. It seems that a short time for pre-task planning or viewing the pictures might free the conceptualizer/planning, while pure online planning helps focus L2 learners' attention on linguistic form (accuracy and/or syntactic complexity), thus enhancing their more effective use of the formulator/translator.

In terms of task modality, writing was more accurate than speaking in both the no planning and online planning conditions. The difference between the two planning conditions was that written performance was much more clearly accurate in online planning (in all three measures of accuracy) than in no planning (in one measure of accuracy) since the online planning condition was less pressured to allow more time for planning, translating, executing, and monitoring. On the other hand, speaking was more fluent than writing in both planning conditions. For fluency, the ranking of the four conditions was: 1) no plan speaking, 2) online plan speaking, 3) no plan writing, and 4) online plan writing. The measure of fluency comprises the mean number of words per minute, and thus the speed of articulation in writing is much faster than the speed of execution in writing, which resulted in speedy performance in speaking.

Lastly, there are some limitations and suggestions for further studies. First, if pre-task planning conditions were included, the CAF relationship depending on all different types of planning would show more inclusive data in both the spoken and written tasks. Second, more detailed time setting is required for further studies. For instance, combining online planning with detailed different pre-task planning time might show a different role of pre-task planning as a trigger for online planning. Third, content elaboration/storyline and other measurements for linguistic performance need to be investigated besides the quantitative measures of linguistic performance, complexity, accuracy, and fluency. If an accurate/complex linguistic performance is induced in compensation for simplified content organization, their relation would demonstrate a better and clearer relationship between fluency and accuracy/complexity through more careful language measures. The AS-unit for syntactic complexity in speaking or keystroke-logging data for fluency in writing would provide more valid measures in light of the current conceptualization of the construct. It is hoped that task manipulation would be more convincingly supportive to change the interlanguage system and task performance in class.

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Applicable levels: Secondary, tertiary

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