OPEN ACCESS

Australian Journal of Applied Linguistics
ISSN 2209-0959
https://www.castledown.com/journals/ajal/

Australian Journal of Applied Linguistics, *8* (5), 102876 (2025)
https://doi.org/10.29140/ajal.v8n5.102876

An investigation into the effects of planning conditions and task difficulty on complexity, accuracy, and fluency in intermediate EFL learners' writing

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Abstract

Second language scholars have been examining how various planning conditions affect the writing proficiency of second language (L2) learners. However, the degree to which these effects differ according to specific planning conditions and task difficulty remains insufficiently explored. This study aimed to compare the effects of pre-task planning (PTP) and careful online planning (COP) on L2 writing, with a specific focus on how task difficulty was influenced by varying argumentation demands. Forty-eight intermediate English as a Foreign Language (EFL) students were assigned equally across two groups (n = 24). Each group performed two writing tasks that varied in difficulty, based on the level of argumentation required. The texts produced by the participants were evaluated for their lexical and syntactic complexity, accuracy, and fluency (CAF). The results revealed no significant differences in lexical and syntactic complexity between the PTP and COP conditions. In contrast, careful online planning demonstrated significant improvements in both accuracy and fluency. Additionally, the influence on accuracy was affected by task difficulty, showing greater advantages for easier tasks compared to more difficult ones. No similar effects were found for lexical and syntactic complexity or fluency. The study also discussed its pedagogical implications and limitations.

Keywords: CAF measures, careful online planning, pre-task planning, task difficulty

Introduction

In the field of task-based language teaching, the manipulation of task planning as a component of task difficulty can affect learners' writing performance with respect to complexity, accuracy, and fluency (CAF) (Johnson, 2020). The subject of task planning has attracted the interest

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of researchers in both first language (L1) and second language (L2) writing for an extended period, possibly due to its apparent importance in improving learners' writing skills. The necessity of exploring the potential effects of task planning on writing is supported by both theoretical and pedagogical frameworks. Theoretically, various models suggest that providing time for planning can enhance writing outcomes. Among these are the Limited Attentional Hypothesis (Skehan & Foster, 2001), the Cognition Hypothesis (Robinson, 2001, 2003), and the notion of Attentional Funneling (Kellogg et al., 2013). A fundamental principle emphasized by these models is that allocating time for planning prior to writing can lead to better performance by enabling learners to manage their limited attentional resources more effectively during the translation phase. Ellis (2022) highlighted the crucial function of pre-task planning (PTP) in the context of L2 writing. He advocated for an option-based approach that fosters collaboration between instructors and students to identify the most effective PTP strategies, thereby optimizing the advantages for learners.

Johnson et al. (2012) classified task planning into two primary types of PTP and online planning. PTP refers to the phase where learners dedicate time to planning before commencing the writing process, whereas online planning refers to the situation where learners engage in planning during writing. A variety of empirical investigations have examined the effects of these two planning approaches on the CAF measures of learner writing (see Johnson & Abdi Tabari, 2023). Although PTP shows considerable potential for improving learners' writing performance, research findings regarding its influence on writing outcomes have been inconsistent (e.g., Ellis & Yuan, 2004; Ong & Zhang, 2010). Additionally, Ellis (2022) highlighted the necessity for further research to investigate the interaction effects of different planning conditions and levels of task difficulty on learner writing, particularly concerning the impacts of PTP and careful online planning (COP) on difficult writing tasks. Recently, Johnson and Abdi Tabari (2023) emphasized that the interplay between task difficulty and planning conditions requires more thorough exploration. The authors highlighted that different levels of demand associated with a writing task necessitate varying amounts of attentional resources, which are affected by specific types of planning conditions. However, little research has been conducted to explore these effects. This research is essential due to the possibility that PTP may not yield any advantages in carrying out a difficult task as learners tend to "engage in deeper online planning if they have the chance, resulting in a loss of fluency and negating any effect that PTP might have had" (Ellis, 2022, p. 81). Consequently, this study seeks to examine whether different planning conditions, characterized as COP and PTP, can produce distinct effects on the CAF measures of student writing in relation to a difficult writing task.

Literature Review

Research on Pre-task Planning and Careful Online Planning

Beginning with the research conducted by Ellis and Yuan (2004), a significant number of studies have explored the effects of PTP on students' writing performance. However, only a limited number of studies have examined the effects of different planning conditions—specifically PTP, COP, and the absence of planning—on students' writing performance, which is evaluated using CAF metrics (Abdi Tabari, 2016, 2017; Ellis & Yuan, 2004, 2005; Ghavamnia et al., 2013; Golparvar & Azizsahra, 2023; Piri et al., 2012; Rahimpour & Safarie, 2011; Rostamian et al., 2018). The results from these studies have demonstrated inconsistency.

Research studies focusing on students' writing proficiency all indicated that PTP was significantly more effective in enhancing writing fluency compared to COP. Conversely, the findings related to writing accuracy were inconclusive. Specifically, five studies (Ellis & Yuan, 2004,

2005; Ghavamnia et al., 2013; Golparvar & Azizsahra, 2023; Rostamian et al., 2018) suggested that COP was considerably more beneficial for improving students' writing accuracy than PTP. In contrast, four other studies (Abdi Tabari, 2016, 2017; Piri et al., 2012; Rahimpour & Safarie, 2011) found no significant differences between the two planning conditions in terms of writing accuracy. Additionally, two studies (Ghavamnia et al., 2013; Rostamian et al., 2018) indicated that PTP might lead to greater syntactic complexity compared to COP. However, one study (Ellis & Yuan, 2005) presented findings that contradicted this conclusion, while the remaining six studies reported no significant differences between the two planning conditions.

Several factors including the characteristics of writing assignments and the proficiency levels of students, may lead to the inconclusive results observed. Nonetheless, these results may also underscore the need for additional research into the effects of PTP and COP on learner writing. Moreover, Robinson's (2011) framework on task difficulty identifies six elements and six reasoning aspects that pertain to the resource-directing variable. A significant number of studies examining the influence of the two planning conditions on student writing have predominantly concentrated on narrative or descriptive tasks, which encompass a limited range of elements. As a result, persuasive writing tasks, which necessitate more intricate reasoning, have not been thoroughly investigated. Additionally, Teng and Zhang (2020) proposed that a persuasive writing assignment can serve as an effective measure of the writing skills of L2 learners. Therefore, it is essential to explore the effects of the two planning conditions on persuasive writing tasks.

Research on Planning Conditions and Task Difficulty

In the past few years, the research on planning conditions has increasingly emphasized the interaction between these conditions and task difficulty. A multitude of studies has explored how these interactions affect the evaluation of the CAF in student writing (e.g., Abdi Tabari, 2019; Abdi Tabari & Wang, 2022; Fazilatfar et al., 2020; Ong, 2014; Rahimi & Zhang, 2018). However, these studies exhibit considerable variation in their methodologies for defining and operationalizing planning conditions and task difficulty. For instance, Rahimi and Zhang (2018), Abdi Tabari (2019), and Abdi Tabari and Wang (2022) characterized planning conditions as either strategic planning or no planning, while Fazilatfar et al. (2020) and Ong (2014) differentiated planning conditions based on the length of planning time (specifically, 0, 10, and 20 minutes). Regarding task difficulty, Rahimi and Zhang (2018) utilized two persuasive writing tasks that differed in argumentation demands and the number of components involved. Conversely, Abdi Tabari (2019) employed three writing tasks from various genres arranged by increasing difficulty, and Abdi Tabari and Wang (2022) used two distinct writing tasks that varied based on topic familiarity. Ong's (2014) research, which was largely replicated by Fazilatfar et al. (2020), classified task difficulty into three levels: topic, topic and ideas, and topic, ideas, and macrostructure. It is clear that the differing operational definitions of planning conditions and task difficulty may lead to the mixed or even contradictory findings observed across these studies. Furthermore, the interaction effects of specific planning conditions, such as PTP and COP, concerning dimensions of task difficulty including with or without argumentation, remain inadequately explored.

Research that emphasizes the primary effects of planning conditions (e.g., Abdi Tabari, 2016; Ghavamnia et al., 2013) and the significant dimensions of task difficulty (e.g., Golparvar & Rashidi, 2021; Zhan et al., 2024) often overlooks the interaction effects of these variables on learner writing. Investigating these interactions can yield important insights into how they collectively influence writing performance. It is noteworthy that there is a limited body of research examining the interplay between planning conditions and task difficulty concerning students'

writing performance. In this framework, planning conditions are categorized as PTP and COP, while task difficulty is defined by the argumentation level required. Evidence suggests that PTP may be particularly advantageous for enhancing learners' writing performance on difficult tasks, as it affords them additional time to prepare their written work. For example, during a difficult writing task, students under the PTP condition are likely to activate their generative language system, thereby optimizing their inter-language knowledge, which may result in the complexity of their writing (Abdi Tabari, 2019). This viewpoint is further corroborated by the attentional funneling concept presented in the research by Kellogg et al. (2013). This concept posits that when writers face a difficult writing task, they engage in idea generation and organization during the PTP phase. This approach reduces the cognitive load on their working memory, enabling them to devote more attentional resources to language-related aspects during the writing process (Ellis, 2021), which may enhance their overall writing performance.

Nevertheless, several research studies such as those conducted by Kang and Lee (2019) and Salimi and Fataoolahnejad (2012), have not found a positive effect of PTP on the execution of difficult writing tasks. As highlighted by Ellis (2022), the characteristics of difficult writing assignments may prompt students to engage more deeply in COP, particularly in a relaxed setting, potentially negating any benefits that PTP could provide. These tasks often place a considerable cognitive burden on students, and the absence of pressure in COP allows them ample time to carefully think through, express, and generate their language output (Ellis, 2005). The Interaction Hypothesis, as proposed by Kellogg (1996), suggests that learners should have opportunities to thoughtfully conceptualize, articulate, and produce their ideas interactively and iteratively throughout the writing process. It is suggested that permitting students to write on a difficult subject in a low-pressure COP context may lead to superior written outcomes compared to a PTP environment, despite the perceived benefits of PTP for such tasks. This raises a significant question regarding whether different planning conditions exert distinct effects on learners' writing performance when tackling a difficult writing assignment. Investigating the interaction effects of various planning conditions (specifically PTP and COP) alongside task difficulty on learners' writing performance could be advantageous. The study is structured around the following two research questions:

1. In what ways does the type of planning (i.e., PTP versus COP) affect the writing task performance of EFL learners?
2. Are the effects of planning type influenced by the difficulty of the task?

Method

Design

This study utilized a mixed-methods approach, incorporating planning condition (PTP or COP) as a between-participant variable and task difficulty (high or low argumentation demands) as a within-participant variable. The independent variables included planning condition and task difficulty, while the dependent variables were assessed through CAF measures of learner writing. This design was chosen to examine the potential influence of planning condition on learner writing and to ascertain whether these effects vary according to the difficulty of the tasks. Participants were categorized into two groups, each undertaking two writing tasks that differed in argumentation demands. To control for any potential exercise effects, the order of the two tasks was counterbalanced. One group performed the tasks in an order that began with higher argumentation demands followed by lower demands, while the other group completed the tasks in the opposite order.

Participants

The study involved 48 undergraduate sophomore students (21 males and 27 females) studying English as a foreign language at a university in Iran. The participants' ages ranged from 19 to 21 years with a mean age of 20.5. None of the participants had traveled to an English-speaking country, and they had limited opportunities to practice English outside the classroom environment. The participants were randomly divided into two groups, one focusing on PTP and the other on COP, with each group consisting of 24 students.

To ensure the homogeneity of participants regarding their English proficiency levels, the procedure adopted by Liang and Xie (2023) was followed. This involved assessing the participants' language proficiency through the Oxford Quick Placement Test (OQPT; UCLES, 2001). Based on their OQPT scores, they were considered as intermediate level English students (M = 42.91, SD = 3.72). After gathering the scores from all individuals, an independent samples t-test was performed. The results indicated that the PTP group achieved a mean score of 44.55 (SD = 3.86), while the COP group obtained a mean score of 41.08 (SD = 3.98). The analysis showed no significant difference in English proficiency between the two groups (t (46) = 1.679, $p > .05$).

In a similar vein, to confirm the homogeneity of participants' writing proficiency at the outset of the study and to determine if there was a significant difference in their writing abilities, participants were asked to complete a persuasive writing task. The researcher asked two colleagues holding MA degrees in Teaching English as a Foreign Language (TEFL) and with professional experience in teaching writing to foreign language learners to grade the writings. The evaluations were conducted using the rating scale developed by Heaton (1990) for intermediate-level students. The results indicated that the PTP group had a mean score of 134.45 (SD = 17.02), whereas the COP group recorded a mean score of 128.65 (SD = 17.54). Again, there was no significant difference in writing proficiency between the two groups (t(46) = 1.275, $p > .05$), allowing us to conclude that both groups possessed a comparable level of writing proficiency at the commencement of the study.

At the time of the study, participants were enrolled in the Advanced Academic Writing course offered within the English program. Prior to undertaking this unit, they had finished the Paragraph Writing Development unit during the third semester of their second year. The Advanced Academic Writing course is conducted over a full semester, encompassing a duration of 16 weeks. Participants receive comprehensive training in expository writing, aimed at developing their skills to write descriptive and argumentative summaries of academic papers.

Writing Tasks

The participants in this study were divided into two separate groups, each designated as either PTP or COP. Within these groups, students were prompted to undertake two writing tasks that differed in difficulty, specifically characterized by varying levels of argumentation demands (see Appendix). The chosen writing tasks comprised a narrative assignment, which was identified as having lower argumentation demands, and a persuasive assignment that required higher argumentation demands. This selection was based on several factors. Firstly, it is argued that a writing task with increased cognitive complexity involves increased argumentation demands (Rahimi, 2019). Secondly, it has been indicated that a persuasive task generally places greater argumentation requirements on students than a narrative task (Zhan et al., 2024). The complexity of cognitive tasks may correlate with the argumentation demands and the particular genres involved (Ruiz-Funes, 2015). As a result, this study included both a narrative task, considered straightforward, and a persuasive task, regarded as more intricate.

To ensure the effectiveness of the task difficulty manipulation in this study, eight experienced EFL writing instructors were recruited to evaluate both the easy and difficult tasks using a rating scale ranging from 1 to 10, where a lower score signifies a less difficult writing task. The narrative task was categorized as easy, requiring minimal argumentation as it merely asked students to describe a healthy food they like. In contrast, the persuasive task was classified as difficult due to its greater argumentation requirements, asking students to analyze the advantages and challenges of eating healthy food.

Procedure

This study was conducted over four separate class sessions, during which students participated in a writing task in each session. Prior to the first writing task, students assigned to the two planning conditions received instructions in Persian concerning the planning and writing of their essays. To determine the time allocation for students in the PTP condition to complete both easy and difficult writing tasks, a small pilot study was conducted four weeks prior to the main experiment, involving eight students with similar profiles to those in the current study. This pilot study was carried out over two non-consecutive class sessions, during which the students completed one easy task and one difficult task, respectively, to reduce the likelihood of writing fatigue. The results revealed that the fastest completion time for the easy writing task was 26 minutes and 40 seconds, while the quickest time for the difficult writing task was 33 minutes and 50 seconds. As a result, students in the PTP condition were assigned these two time limits for the composition of their essays following a planning period, which was set at ten minutes in accordance with previous research (e.g., Ellis & Yuan, 2004; Rostamian et al., 2018).

Throughout the ten-minute planning time, students were allowed to take notes on the assigned writing topic; however, these notes were collected prior to the writing phase. Following this, they were asked to write at least 130 words for each topic, a requirement designed to improve their focus on the writing task. In contrast, students in the COP condition were given unlimited time to write their essays but were required to start writing immediately without any preliminary planning. Unlike their peers in the PTP condition, they were not subject to a minimum word count, as such a stipulation could lead to rushed writing.

Data Analysis

This research utilized CAF measures to assess the writing performance of students, as these three indicators are effective in evaluating learners' capabilities during specific tasks (Skehan, 1998). For the assessment of lexical complexity, two specific metrics were utilized: the measure of lexical variety (MLV) and the frequency of content words (FCW). The MLV was chosen because, unlike the type-token ratio, it serves as a MLV that is minimally influenced by the length of the text (McCarthy & Jarvis, 2010). The FCW indicates the average FCW found in the CELEX database (Graesser et al., 2004), providing a robust corpus for a more comprehensive analysis of lexical sophistication in student writing compared to frequency band metrics. This methodology facilitates the identification of writing improvements across different proficiency levels (Kyle & Crossley, 2015). Both the MLV and the FCW were calculated using Coh-Metrix 3.

In this research, Lu's (2010) L2 Syntactic Complexity Analyzer (L2SCA) was utilized to assess the syntactic complexity of student writing through two specific measures: the mean length of T-units (MLT) and the ratio of clauses per T-unit (RCT). Wolfe-Quintero et al. (1998) have indicated that these metrics serve as reliable indicators for evaluating syntactic complexity in student compositions. To ensure precision, this study incorporated the metric of without error clause ratios (WEC/C), which is calculated based on the percentage of clauses that are free from errors. This particular metric was chosen due to its strong correlation with various error met-

rics (Polio & Shea, 2014) and its superior suitability for evaluating the accuracy of intermediate EFL learners' writings compared to other metrics, such as error-free T-units (Wolfe-Quintero et al., 1998). Consistent with the accuracy measure outlined by Zhan et al. (2024), the errors identified in this study were classified as those related to morphology, syntax, lexical selection, or word order, while errors concerning capitalization, spelling, and punctuation were excluded. A higher ratio signifies a composition with enhanced writing accuracy. To maintain inter-rater reliability, the author and a research assistant independently coded 15% of the dataset manually. After achieving a reliability coefficient greater than .83, they proceeded to hand-code the remaining data, which was evenly distributed between them. Regarding fluency, this study assessed fluency by calculating the total number of words produced by learners within the specified time limit.

A total of 96 student writings were gathered for this research. The research assistant transcribed the handwritten submissions into a digital format, which were then saved as Word documents. The researcher subsequently verified these documents against the originals. Following this, all student writings underwent analysis for CAF measures.

To address the first and second research questions, the study employed histograms, normal Q_Q plots, and conducted Kolmogorov-Smirnov tests to evaluate the normal distribution prior to performing a repeated measures multivariate analysis (MANOVA). The findings revealed that the normal distributions for certain measures were not maintained. As a result, both parametric and non-parametric tests were applied to examine the effects of task difficulty and planning conditions on learner writing, as noted in the studies by Rahimi and Zhang (2018) and Tao and Wang (2022). To mitigate the risk of Type I error, a Bonferroni correction was implemented, adjusting the alpha level to .0082 (i.e., .05/.06) for the analysis of all student writing measures. The study utilized Cohen's (1988) benchmarks for interpreting effect sizes of partial η^2 (small = .01, medium = .06, large = .14) in mixed ANOVA tests and adhered to Cohen's (1992) guidelines for effect sizes of *r* (small = .10, medium = .30, large = .50) in the Wilcoxon and Mann–Whitney tests.

Results

Tables 1 and 2 display the descriptive statistics for the CAF measures across each group under the PTP and COP conditions, respectively.

Table 1. *Descriptive statistics of easy and difficult tasks for the PTP condition group*

Measures		Easy task	Difficult task
Lexical complexity			
MLV	Mean	61.45	66.60
	SD	18.39	22.86
FCW	Mean	2.41	2.37
	SD	0.10	0.12
Syntactic complexity			
ALT	Mean	11.94	11.71
	SD	3.10	2.37

(*Continued*)

Table 1. (Continued)

Measures		Easy task	Difficult task
RCT	Mean	1.49	1.49
	SD	0.25	0.22
Accuracy			
WEC/C	Mean	0.51	0.50
	SD	0.18	0.18
Fluency			
E	Mean	143.18	151.54
	SD	28.11	26.23

Note. MLV = measure of lexical variety; FCW = frequency of content words; ALT = average length of T-units; RCT = ratio of clauses per T-unit; WEC/C = without error clause ratios; E = entire number of words

Table 2. *Descriptive statistics of easy and difficult tasks for the COP condition group*

Measures		Easy task	Difficult task
Lexical complexity			
MLV	Mean	59.14	65.01
	SD	17.97	18.00
FCW	Mean	2.40	2.42
	SD	0.09	0.09
Syntactic complexity			
ALT	Mean	12.50	10.70
	SD	2.76	2.70
RCT	Mean	1.58	1.37
	SD	0.27	0.26
Accuracy			
WEC/C	Mean	0.85	0.62
	SD	0.13	0.15
Fluency			
E	Mean	155.53	161.23
	SD	31.95	33.54

Note. MLV = measure of lexical variety; FCW = frequency of content words; ALT = average length of T-units; RCT = ratio of clauses per T-unit; WEC/C = without error clause ratios; E = entire number of words

As for the effects on lexical complexity, the mixed ANOVA analysis revealed no significant main effects of task difficulty (p = .665, partial η^2 = .002) or planning conditions (p = .499, partial η^2 = .007) on FCW. Furthermore, there was no interaction detected between task difficulty and

planning conditions concerning FCW (p = .052, partial η^2 = .061). Regarding lexical variety, two Mann–Whitney tests indicated that the PTP and COP conditions did not yield significantly different effects on the MLV for either the easy task (Z = –.648, p = .512, r = .07) or the difficult task (Z = –.056, p = .949, r = .01). Additionally, two Wilcoxon Signed-Rank Tests demonstrated that the students' MLV did not exhibit significant differences between the easy and difficult tasks under the PTP condition (Z = 1.365, p = .168, r = .16). Similar non-significant results were found for the COP condition (Z = –1.365, p = .168, r = .16). These results imply that variations in task difficulty and different planning conditions did not significantly influence lexical complexity, suggesting that the generation of lexical complexity was not dependent on the duration of planning time provided.

With regard to the effects on syntactic complexity, the results of the mixed ANOVA indicated that there were no significant main effects of task complexity (p = .019, partial η^2 = .083) or planning conditions (p = .805, partial η^2 = .001) on the RCT in student writing. Furthermore, the analysis did not reveal any interaction between task complexity and planning conditions concerning RCT (p = .018, partial η^2 = .085), indicating that changes in task complexity and planning conditions did not significantly influence the RCT of student writing. Additionally, the production of RCT was found to be independent of the allocation of planning time. Two Mann–Whitney tests indicated that PTP and COP did not yield significantly different effects on the ALT for the easy task (Z = .574, p = .561, r = .06) or the difficult task (Z = –1.224, p = .217, r = .15), implying that the various planning conditions did not lead to differences in ALT for either type of task. Two Wilcoxon signed-rank tests produced contradictory results. One test indicated that the learners' ALT did not show a significant difference between the easy and difficult tasks in the PTP condition (Z = –.119, p = .899, r = .01). In contrast, the other test revealed a significant difference in ALT between the difficult and easy tasks under the COP condition (Z = 3.69, p < .001, with an effect size nearing a large value (r = .45). The median MLT score grew from the difficult task (Md = 10.73) to the easy task (Md = 12.00). This finding indicates that students in the COP condition were able to produce writing with a greater ALT in the easy task compared to the difficult task.

With respect to the effects on accuracy, two Mann–Whitney tests revealed a significant benefit of COP over PTP regarding WEC/C for both the easy task (Z = 2.339, p < .001) and the difficult task (Z = .129, p < .001), with effect sizes categorized as medium (r = .28) and small (r = .02), respectively. In terms of accuracy for students in the PTP condition, a Wilcoxon Signed-Rank Test showed no significant difference in WEC/C between the easy and difficult tasks (Z = –.248, p = .798, r = .03). Conversely, for students in the COP condition, a Wilcoxon Signed-Rank Test indicated a statistically significant improvement in the WEC/C of their writing (Z = 3.55, p < .001), with an effect size nearing the large threshold (r = .44). The median WEC/C grew from the difficult task (Md = .610) to the easy task (Md = .880), suggesting that the easy task may enhance accuracy more effectively than the difficult task. Overall, the results indicated that students working under the COP condition produced writing with greater accuracy compared to those in the PTP condition. Furthermore, the impact of COP on accuracy was influenced by task difficulty, demonstrating a significantly greater advantage for easy tasks over difficult ones.

With regard to the effects on fluency, two Mann–Whitney tests revealed a significant benefit of COP over PTP in terms of total word count for both the easy task (Z = .705, p < .001, r = .08) and the difficult task (Z = .159, p < .001, r = .02), with effect sizes classified as small for each task. Furthermore, two Wilcoxon Signed-Rank Tests indicated no significant difference in fluency when comparing the easy task to the difficult task for students in the PTP condition (Z = 1.779, p = .069, r = .22), nor from the difficult task to the easy task for students in the COP condition (Z = .139, p = .879, r = .02). These results imply that students in the COP condition exhibited enhanced fluency in their writing compared to their counterparts in the PTP condition.

Discussion

This study examined the differing effects of PTP and COP on student writing, recognizing that each planning method presents distinct benefits for writing assignments, particularly those of a more difficult nature. In relation to the primary research question, the findings did not reveal any advantages of either PTP or COP concerning the complexity of student writing. However, regarding accuracy and fluency, a significant difference was observed between the two conditions, with students in the COP group outperforming their peers in the PTP group. The results pertaining to the secondary research question indicated that the influence of the planning condition was consistent, irrespective of task difficulty. These results stand in contrast to the findings of Ghavamnia et al. (2013) and Rostamian et al. (2018), which suggested that PTP was linked to enhanced complexity in student writing. Furthermore, the outcomes also differed from those reported by Rahimpour and Safarie (2011), who found that PTP improved fluency. Nonetheless, these results are consistent with various studies (e.g., Ellis & Yuan, 2004, 2005; Golparvar & Azizsahra, 2023; Liang & Xie, 2023) that indicated COP is more beneficial for accuracy than PTP.

One factor contributing to the enhanced accuracy observed in COP is the provision of additional time for students to utilize their explicit language knowledge. This opportunity facilitates improvements in accuracy through the processes of editing and monitoring their language output, rather than depending exclusively on implicit language knowledge (Ellis, 2005). Furthermore, alongside the monitoring process, COP positively influences the formulation stage, allowing students to generate written work with increased precision (Ellis, 1987; Hulstijn & Hulstijn, 1984; Yuan & Ellis, 2003). Conversely, in the PTP condition where students face time constraints, they are more inclined to rely on their implicit language knowledge (DeKeyser, 2003). Additionally, as outlined in Hayes's (2012) writing process model, COP can improve the accuracy of student writing by activating and increasing the frequency of the proposer, translator, and evaluator processes. Conversely, when students operate under pressure in the PTP condition, their ability to enhance accuracy diminishes due to insufficient time for effective monitoring, revising, and editing of their writings (Abdi Tabari, 2017; Golparvar & Azizsahra, 2023). Likewise, in accordance with Skehan's (1998) dual-mode system theory, COP alleviates the stress associated with writing, enabling students to engage with the rule-based system and access their linguistic knowledge to improve accuracy. In contrast, students working under PTP conditions may find it challenging to engage with this system due to time constraints. The study by Rostamian et al. (2018) provides valuable insights into the positive effects of COP on writing accuracy. It was found that students in the COP condition demonstrated a higher incidence of self-correction for written errors during the translation process when compared to their counterparts in the PTP condition. This tendency led to improved accuracy in the writings produced by those in the COP condition. In the realm of L2 writing instruction, it is crucial for instructors to take into account the cognitive aspects of writing, as different planning conditions can have a significant impact on student writing.

This investigation did not reveal more pronounced effects of the PTP on the syntactic and lexical complexity of student writing compared to the COP. Several factors may contribute to this finding. Firstly, according to Hayes's (2012) model of text processing, students might use the ten-minute planning period to develop and recall effective sentence structures and vocabulary. This strategy could reduce the demands on their working memory during the translation and transcription phases, enabling them to devote more cognitive resources to producing relatively complex written work. Nevertheless, this potential advantage was not evident in the study's results. One possible explanation is that the vocabulary and structures that EFL learners

mentally construct may be fundamentally insufficient in terms of their capacity, completeness, and organization (Skehan, 2009). Such inadequacies could impede their ability to effectively employ the intended vocabulary and structures during the translation phase (Temple, 2000). Furthermore, the students' dependence on their first language during the planning phase may negatively impact the syntactic and lexical complexity of their writing. Although participants were instructed to choose either L1 or L2 prior to the study, all opted to use their L1 for note-taking during the planning period. It is likely that participants faced difficulties in transforming their notes into written texts during the translation and transcription phases, primarily due to their limited proficiency in the second language, which ultimately led to a decrease in writing complexity. Furthermore, another element that may contribute to the limited effectiveness of PTP on writing complexity is the lack of instruction provided to the students in this study regarding effective writing planning techniques. Elder and Iwashita (2005) noted that training in the optimal use of planning time led to significant improvements in the speaking complexity of L2 learners. In the context of L2 writing, various researchers have underscored the importance of such training in enhancing writing complexity (e.g., Ellis, 2022; Kellogg, 2008). Specifically, Ellis (2022) pointed out that it is often assumed that students have the capability to plan; however, many do not have sufficient practical experience in this regard. Additionally, Gauthier (2007) found that this type of training is particularly beneficial for EFL learners who have limited proficiency in L2 writing. As a result, the absence of this training may impede the students in this study to enhance the complexity of their writings.

The results of this study did not conform to those reported by Liang and Xie (2023), which suggested that COP offered benefits over PTP regarding the syntactic complexity of student writing. A potential reason for this inconsistency may lie in the fact that the students in Liang and Xie's study participated in collaborative planning prior to writing, while the participants in the present study were directed to engage in individual planning. The enhancement of syntactic complexity necessitates that students expand their interlanguage system (Skehan, 1996), a process that can be facilitated through the exchange of linguistic knowledge during collaborative planning. According to Skehan and Foster's (2001) Limited Attentional Hypothesis, which is based on information processing theory, the trade-off effects arising from limited attentional resources may impede learners' capacity to focus on CAF in language production simultaneously. Therefore, it can be concluded that students involved in COP might improve the accuracy and fluency of their writing, potentially at the cost of complexity, which could account for the minimal effect of COP on the complexity of their writing. Additionally, the characteristics of the writing assignment may also play a role in this result. In the research conducted by Ghavamnia et al. (2013) and Rostamian et al. (2018), participants were asked to compose a narrative based on a sequence of images. Conversely, the present study required students to engage in both narrative and persuasive writing tasks. Although both the earlier studies and the current one featured a narrative element, they differed in that the current study offered only a writing prompt, lacking any visual aids. It is plausible that students could generate more complex writings when presented with a narrative task that includes visual elements.

Further to the impacts of planning conditions, this investigation also found that students experiencing COP demonstrated greater accuracy in simpler tasks compared to more complex ones. One potential explanation for this observation is that the higher pressure associated with complex tasks may lead to a depletion of attentional resources, thereby hindering students' ability to produce written work with the necessary level of accuracy (Frear & Bitchener, 2015). In contrast, students under COP had a relatively generous amount of time to focus on the task

at hand. That is to say, the potential benefits of COP may be diminished by the challenges presented by a complex task. Conversely, a simpler task can alleviate the demands on students' working memory, thereby increasing the likelihood that they will access the linguistic resources available in their language knowledge base, resulting in more accurate writing. This advantage of simpler tasks over complex ones can be further enhanced by the presence of COP. In the context of L2 writing, instructors should recognize the significance of task difficulty in their writing instruction and the importance of assigning writing tasks in a thoughtful sequence. Specifically, when organizing tasks, it is advisable for teachers to consider the cognitive load associated with each task, as easier tasks generally promote greater writing accuracy and syntactic complexity compared to difficult tasks.

As for fluency, two explanations can elucidate why COP may lead to enhanced fluency in student writing compared to PTP. Firstly, the students operating under COP condition are likely to be those who have developed the ability to manage both planning and writing processes concurrently (Wang & Wen, 2002). This dual engagement may equip them with greater automaticity than their peers in PTP conditions, as it alleviates the cognitive load they experience. Such automaticity increases the likelihood of accessing their procedural linguistic knowledge, potentially resulting in improved fluency. Secondly, according to Ortega (1999), students in the COP condition are more inclined to compose writings with greater fluency compared to those in a PTP condition. This difference arises because the former group prioritizes meaning, while the latter group concentrates on form.

Conclusion

This study aimed to investigate the effects of PTP and COP on CAF in intermediate EFL learners' writing, as well as to assess whether these effects varied according to task difficulty. The findings demonstrated no significant differences in the impact of PTP and COP on complexity measures. Nevertheless, COP appeared to provide greater advantages than PTP in terms of enhancing accuracy and fluency measures. Moreover, the research did not identify any interaction between the planning conditions and the difficulty of the tasks. In summary, COP may improve writing accuracy by facilitating the retrieval of explicit linguistic knowledge, engaging the rule-based system, and enhancing the functions of proposer, translator, and evaluator. Additionally, it may foster writing fluency among students due to specific attributes associated with this planning condition. In contrast, the insufficiently developed vocabulary and structures, along with inadequate training and reliance on L1 in PTP, may account for the lack of increased complexity in writing. It is essential to note that the participants in this study were EFL students with intermediate English proficiency, and the writing task was confined to persuasive essays of 130 words. Therefore, caution should be exercised when generalizing the results of this study to other educational contexts.

It is important to acknowledge several limitations present in this study. Firstly, the research concentrated exclusively on the immediate effects of planning conditions; thus, future investigations should consider utilizing a longitudinal approach to assess the long-term effects of these conditions on student writing. Secondly, further research should explore the specific strategies students employ when confronted with various planning conditions while engaging in writing tasks of differing difficulty. Such studies could yield valuable insights into the cognitive and emotional processes that students navigate during writing activities (Johnson & Abdi Tabari, 2023). Lastly, it is crucial to acknowledge that the learners' intermediate level of English proficiency may restrict their capacity to fully benefit from the PTP condition. The students with a higher level of proficiency may experience different outcomes in their writing as a result of this condition.

The findings provide several pedagogical implications for L2 acquisition and writing pedagogy. L2 writing instructors are encouraged to take into account various planning conditions and their benefits, and to incorporate them into classroom activities. They can guide learners' focus towards the three aspects of CAF in L2 writing by adjusting planning conditions and the difficulty of the writing task, allowing L2 writers the chance for PTP and COP. Considering that L2 learners, particularly those with limited language skills, often struggle to fully engage with all aspects of language performance and tend to prioritize accuracy or occasionally fluency over complexity, adjusting planning conditions helps them in enhancing the quality of their written work.

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Appendix

Please write a composition of at least 130 words based on the following topic and support your writing with justifications, arguments, and pertinent examples from your own knowledge or experience.

Easy Task: Write an essay about a healthy food you like.

Difficult Task: Eating healthy food can be useful for people; however, it also presents certain challenges that they may encounter. What are your thoughts on the advantages and challenges associated with eating healthy food? It is important to support your perspective with well-founded reasons.