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An Investigation into the Effects of Joint Planning on Complexity, Accuracy, and Fluency across Task Complexity*

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Abstract

The current study aimed to examine the effects of strategic planning, online planning, strategic planning and online planning combined (joint planning), and no planning on the complexity, accuracy, and fluency of oral productions in two simple and complex narrative tasks. Eighty advanced EFL learners performed one simple narrative task and a complex narrative task with 20 minutes in between. The order of the two stories was counterbalanced to control for any possible practice effect. The results suggest that no planning in both tasks was the least effective. Strategic planning led the learners to elevate both their complexity and fluency significantly in the narrative simple task and only their fluency in the complex task. Online planning helped the participants improve their accuracy significantly both in the simple and complex tasks. Finally, joint planning resulted in the significant elevation of accuracy and fluency in the simple task on the one hand, and complexity and accuracy in the complex task on the other. With respect to the effect of task complexity, the interaction between task complexity and CAF was significant. The results and comparisons between groups are discussed in the light of Levelt's model of speaking, Skehan's Trade-off Hypothesis, and earlier studies.

Keywords: task, complexity, accuracy, fluency, task complexity

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Introduction

An amalgam of different factors is at play considering the differential success of learners while performing various tasks and in this respect planning type, among others, is one of the highly influential factors. Planning has been addressed by a myriad of studies from different angles. Ellis (2009) argues that the investigation into the effects of different kinds of planning on task performance bears great importance since it can inform the methodology of task-based teaching with respect to various factors such as whether or not to give students time for planning and if yes how much and what kind. Ellis (2005) categorized planning into two general types. He made a distinction between pre-task or strategic (i.e. the planning before the task) and within-task or online planning (i.e. the planning during the task). The former is further divided into rehearsal and strategic planning. Learners, in strategic planning, have time to reflect on the content and the language they wish to express, while in rehearsal they can perform the whole task as preparation before a second time. Within-task planning has double forms, as well; pressured (i.e., learners have a specific amount of time to perform the task) and unpressured (they have an unlimited amount of time).

Although numerous studies have investigated different planning types, little research has addressed the effects of joint planning (strategic and online planning types combined) on learners' performance. More precisely, the prime impetus for the present study came from the argument put forward by Ellis (2009) according to which "to date no study has examined the joint effects of pre- and within-task planning" (p. 502). There have been a few studies probing into this subject since then (e.g., Ahmadian & Tavakoli, 2011; Baleghizadeh & Nasrollahi Shahri, 2013). However, the present study breaks new ground owing to two reasons. Firstly, none of the studies have a strategic-planning group so that no comparison has been made between the joint effects of pre- and within-task planning and strategic planning alone. It is noteworthy that strategic planning is the type of planning which has enjoyed the greatest amount of attention from researchers and studies on this type of planning outnumber any other type so that a comparison between strategic and joint planning is in order. Secondly, task structure has not been taken into consideration, whereas the present

study was an attempt to compare different types of planning including the joint type across task complexity which is unprecedented.

The findings of the present study can bear importance from both theoretical and pedagogic aspects. With reference to the former, it can be enlightening since it throws some light at the comparison between different planning types including the combination of strategic and online in one study across two simple and complex tasks. Regarding the latter, it can help teachers make informed decisions as to which planning type should be chosen given the task at hand.

Theoretical underpinnings

Planning as an implementational variable is believed to affect task-based production. The rationale behind allocating planning time is that it lowers the cognitive load in learners' mind so that it can divert part of learners' attentional capacity away from meaning to form (VanPatten, 1990). That is, the planning time can assist learners to compensate for their processing limitations while performing the task with a pace under their own control (Ortega, 1999).

Since psycholinguistic mechanisms and processes which underpin planning are perhaps best illustrated in the model put forward by Levelt (1989), in line with a myriad of studies, the present study will draw on Levelt's model as the first source of reference, among others, to vivify and justify the findings. According to Levelt's (1989) model there are three overlapping stages which shape an utterance the first of which is conceptualization. In the first stage the speaker determines and plans the message to be communicated and the result is the pre-verbal message which is non-linguistic and paves the way for the speaker to embark upon the second stage: formulation. In the second stage, the speaker turns the pre-verbal message into a linguistic plan by grammatical encoding which in its own turn results in internal speech or phonetic plan. The first two stages ready the speaker for the third stage, articulation, according to which the speaker puts the internal speech into practice by executing the phonetic plan and utters the actual words.

Another hypothesis which will inform the present study is Skehan's Trade-off Hypothesis (1998, 2009). This hypothesis argues that complexity and accuracy are in conflict and usually they improve to

each other's detriment due to limited attentional capacity unless this limited capacity is mitigated by means of optimal choice of planning (Skehan and Foster, 1997; Skehan & Wang, 2014; Wang, 2014).

The present study

Research questions

This study was designed to answer the following research questions:

1. When compared with unpressured online planning, strategic planning, and no-planning, does joint planning (strategic planning combined with unpressured on-line planning) affect the oral complexity of the learners' performance in the narrative simple and narrative complex tasks?
2. When compared with unpressured online planning, strategic planning, no-planning, does joint planning (strategic planning combined with unpressured on-line planning) affect the oral fluency of the learners' performance in the narrative simple and narrative complex tasks?
3. When compared with unpressured online planning, strategic planning, no-planning, does joint planning (strategic planning combined with unpressured on-line planning) affect the oral accuracy of the learners' performance in the narrative simple and narrative complex tasks?

Method

Design

The study aimed to investigate the effects of four planning conditions, i.e. strategic, online, joint, and no-planning conditions, on participants' oral production. The design of this study is 4*2 factorial design, in which there are four levels for planning types and two levels for task complexity, i.e. simple and complex tasks.

Participants

Two groups of learners comprised the participants in this study. 80 Iranian EFL learners studying at a private language institutes in four groups, each containing 20 learners, performed two tasks along with the planning types. In line with Ellis's (2009) argument the participants were of advanced level. Ellis (2009) suggests that rarely have studies taken advanced learners into account so that more studies investigating

into tasks are needed to lay emphasis on the advanced students. All the learners, 45 females and 35 males, aged between 20 and 30 and were advanced learners of English at the institute where they had been learning English for at least 4 years. In order to ensure that they were homogeneously at an advanced level they were given an Oxford Placement Test in which all the participants scored as “advanced” (i.e., band 6 on a scale of 0–9).

Tasks

Following Kormos and Trebits (2012) and Trebits (2014) two monologic narrative tasks, one simple (i.e., a series of pictures with a clear storyline) and one complex (i.e., a series of pictures without a clear storyline) were utilized. The tasks, as the criterion measure, required each participant to orally narrate two stories on the basis of a series of pictures as explained above. The reason for using the monologic narrative tasks, instead of dialogic, in the study was three-fold; first and foremost, the use of a monologic narrative task provides the opportunity to assess the participants’ L2 performance abilities that is not confounded by interactional variables characteristic of dialogic tasks; second, the use of a narrative task provides the opportunity to compare the results of the study with those of other studies of the same type; finally, the CAF model, as a standard framework in the literature, and monologic narrative tasks are compatible (Yuan & Ellis, 2003).

Procedure

Task conditions. In the present study planning types were operationalized as follows: (a) no planning (NP), (b) unpressured online planning only (OP), (c) strategic planning only (SP), (d) joint planning (JP) which was a combination of NP and SP.

A small pilot study was conducted to set a time limit for the participants in the NP and SP groups of the simple and complex tasks. Five advanced EFL learners participated in the pilot study and performed both tasks and based on their performance, it was decided to give 5 minutes to participants for completing each task in no planning and strategic planning groups.

No planning. In this condition 10 advanced EFL learners, following Yuan and Ellis (2003), were first provided with the simple task and 10 other learners were provided with complex task in order to create

counterbalance to avoid any possible practice effects. They were asked to narrate the story immediately after studying the pictures, after only 0.5 minute, and finish their narration in 5 minutes. 20 minutes later, the same students carried out the other task in 5 minutes with 0.5 minute for studying the pictures. Both narrations were recorded for later analyses.

Online planning only. As in NP condition the participants, 10 advanced EFL learners, were required to narrate the story based on the simple task and 10 other were asked to narrate the complex task immediately after studying the pictures, after only 0.5 minute. However, following Yuan and Ellis (2003), they were provided with ample time to complete the task in order to plan their speaking. Twenty minutes later, the participants repeated the same procedure (i.e., 0.5 minute for studying the pictures and ample time for narration). The narrations were recorded for later analyses.

Strategic planning only. Following Foster and Skehan (1996), and Yuan and Ellis (2003), and Menhart (1998) the participants of this group, 20 advanced EFL learners, were given 10 minutes to plan their task performance. Menhart (1998) argues that 10 minutes is needed for planning in order to have measurable effects on CAF. They were asked to reflect upon the language and content of what they wished to express. The participants were provided with a piece of paper in order to write their notes. The notes were taken once they wanted to start the narration. The above procedure was first applied by 10 participants in the simple task and 10 participants in the complex task and 20 minutes later the same participants did the reverse. As in the NP condition the participants were required to meet the time limit while performing the task (i.e., 5 minutes).

Joint planning (online and strategic combined). This condition was a combination of OP and SP so that the participants performing under this condition had 10 minutes for planning their production prior to speaking and no time limit for narrating their simple and complex stories which were carried out by each of 20 advanced EFL learners with 20 minutes in between. 10 of the participants performed the simple task first and the other 10 carried out the complex task first and then all of them did the reverse.

The task conditions are summarized as follows:

Table 1

Task conditions in the present study

Task condition	Task complexity	Pre-task planning time	Performance time
No planning	Simple task	No time	5 minutes
	Complex task	No time	5 minutes
On-line planning	Simple task	No time	Unlimited
	Complex task	No time	Unlimited
Strategic planning	Simple task	10 minutes	5 minutes
	Complex task	10 minutes	5 minutes
Joint planning	Simple task	10 minutes	Unlimited
	Complex task	10 minutes	Unlimited

The measures. The following measures were utilized in the present study. The measures opted for were similar to those used in Skehan (1996), Yuan and Ellis (2003), Ellis and Barkhuzian (2005), and Baleghizadeh and Nasrollahi Shahri (2013).

Complexity: Syntactic complexity: This is calculated as the ratio of C-units (i.e., clauses) to T-units. Foster, Tonkyn, and Wiggleworth (2000) define a T-unit as “essentially a main clause plus any other clauses that are dependent upon it” (p. 360).

Accuracy. Error-free clauses: This is calculated by the percentage of error-free C-units relative to the total number of C-units produced by the learner (Robinson, Cadierno, & Shirai, 2009). Errors making a C-unit erroneous can be morphological, syntactic, or lexical.

Fluency: Speech rate: The measure of fluency to be used in the present study is “speech rate”. For the purposes of the present study, speech rate is operationally defined as the total number of syllables produced by each participant divided by the amount of time spent by

the same participant to perform the narrative task. Hesitation and pause time is included in the total amount of time spent to perform the task.

Results

In order to answer the research questions, three two-way repeated measures ANOVAs were run. It is worth mentioning that the normality of all data sets was checked via one-sample Kolmogorov-Smirnov and Shapiro-Wolf tests, and all data sets turned out to be normally distributed since the significance levels of all of them were greater than .05. Table 2 reports the descriptive statistics of the data. Table 3 presents the results of the two-way ANOVAs.

Table 2

Means for complexity, fluency, and accuracy across task complexity

Tasks	Conditions	Complexity	Fluency	Accuracy
Simple task	Strategic planning (STSP)	1.7395	118.60	.5105
	On-line planning (STOP)	1.4790	101.20	.7965
	Joint planning (STJP)	1.4606	112.10	.7170
	No-planning (STNP)	1.4965	108.45	.4920
Complex task	Strategic planning (CTSP)	1.5252	114.25	.4735
	On-line planning (CTOP)	1.5253	94.65	.6330
	Joint planning (CTJP)	1.9825	100.05	.7525
	No-planning (CTNP)	1.5149	98.70	.4900

Table 3

The results of two-way ANOVAS for complexity, fluency, and accuracy across task complexity

Measure	Source	df	F	Sig.	Partial Eta Squared
Complexity	Tasks	1	24.487	.000	.244
	Tasks * Planning.group	3	67.396	.000	.727
	Planning.groups	3	11.426	.000	.311
	Error(Tests)	76			
Accuracy	Tasks	1	34.623	.000	.313
	Tasks * Planning.group	3	37.067	.000	.594
	Planning.groups	3	300.574	.000	.922
	Error(Tests)	76			
Fluency	Tasks	1	160.465	.000	.679
	Tasks * Planning.group	3	6.957	.000	.215
	Planning.groups	3	163.220	.000	.866
	Error(Tests)	76			

The first question concerned the role of planning types on the complexity across task complexity. Table 3 indicates the results of the effect of tasks, planning groups, and their interaction as follows, respectively: $F(1, 76) = 24.487, p < .05, \eta_p^2 = .311$, $F(3, 76) = 11.426, p < .05, \eta_p^2 = .244$, and $F(3, 76) = 67.396, p < .05, \eta_p^2 = .727$. As is clear, the impact of these on the complexity of the learners' performance was significant. It was also meaningful due to the high effect size based on Cohen (1988). Regarding accuracy, the results of the effect of tasks, planning groups, and their interaction were $F(1, 76) = 34.623, p < .05, \eta_p^2 = .313$, $F(3, 76) = 300.574, p < .05, \eta_p^2 = .922$, $F(3, 76) = 37.067, p$

< .05, $\eta_p^2 = .594$, respectively, all of which turned out to be significant and meaningful. In terms of fluency, significant and meaningful differences were found for tasks ($F(1, 76) = 160.465, p < .05, \eta_p^2 = .679$), for planning groups ($F(3, 76) = 163.220, p < .05, \eta_p^2 = .866$), and for their interaction ($F(3, 76) = 6.957, p < .05, \eta_p^2 = .215$). These findings run counter to the null hypotheses posed in this study. Since the differences were significant for all measures, a post hoc analysis was run to see where this difference lied. Table 4 presents the results of the post hoc analysis related to the differences among groups.

Table 4

The results of the post hoc analysis for all measures from simple to complex tasks in each group

Planning Groups	Complexity		Accuracy		Fluency	
	Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
SP-OP*	.1302	.043	-.2228	.000	18.50	.000
SP-JP	-.0892	.268	-.2428	.000	10.35	.000
SP-NP	.1266	.050	.0010	1.000	12.85	.000
OP-JP	-.2194	.000	-.0200	.354	-8.15	.000
OP-NP	-.0036	1.000	.2238	.000	-5.65	.000
JP-NP	.2159	.000	.2438	.000	2.50	.44

* SP= Strategic planning group; OP=on-line planning group; JP= joint planning group; NP= no planning group

As can be seen in Table 4, the differences among all groups in different measures were significant, but the complexity of the SP and JP groups, the complexity of the OP and NP groups, the accuracy of the SP and NP groups, the accuracy of the NP and SP groups, and the fluency of the JP and NP groups.

The interaction of groups and task complexity was also significant. Table 5 reports its post hoc analysis.

Table 5

The post hoc analysis for complexity, accuracy, and fluency across task complexity

Tasks	Groups	Complexity		Accuracy		Fluency	
		Mean Difference	Sig.	Mean Difference	Sig.	Mean Difference	Sig.
Simple	SP-OP	.260	.000	.305	.000	17.400	.000
	SP-JP	.279	.000	.286	.000	6.500	.000
	SP-NP	.243	.000	.080	.000	10.150	.000
	OP-JP	.018	1.000	.206	.000	-10.900	.000
	OP-NP	-.018	1.000	.225	.000	-7.250	.000
	JP-NP	-.036	1.000	-.019	1.000	3.650	.042
Complex	JP-SP	.457	.000	.143	.000	-14.200	.000
	JP-OP	.457	.000	.159	.000	5.400	.000
	JP-NP	.468	.000	-.119	.000	1.350	1.000
	SP-NP	.010	1.000	.279	.000	15.550	.000
	OP-SP	.000	1.000	.263	.000	-19.600	.000
	OP-NP	.010	1.000	.016	1.000	-4.050	.006

Table 5 indicates that in the simple task, the participants in the SP significantly outperformed the other groups in terms of complexity, accuracy, and fluency. The OP group significantly performed better than JP and NP groups in terms of accuracy, and worse than JP and NP groups in terms of fluency. The JP group significantly produced more fluent language than the NP group. The differences in the means of the OP and JP, OP and NP, and JP and NP groups in terms of complexity, and the difference in those of the JP and NP groups regarding accuracy were not significant.

In the complex task, the JP group outperformed other groups regarding complexity and accuracy. Concerning fluency, the JP group significantly did better than the OP group and worse than the SP group; however, the difference in the means of the JP and NP was not significant. The SP group significantly did better than the NP group regarding accuracy and fluency. The OP group significantly outperformed the SP group in terms of accuracy, and significantly did worse than this group regarding fluency. The NP group significantly generated more fluent language than the OP group. The differences in the means of the SP and NP, OP and SP, and OP and NP groups were not significant in terms of complexity, those of the OP and NP groups in terms of accuracy was not significant, and those of the JP and NP groups were not significant regarding fluency. Table 6 provides the performance of each group from the simple to complex tasks.

Table 6

The performance of groups from the simple to complex tasks in terms of complexity, accuracy, and complexity

Condition	Groups	Complexity	Accuracy	Fluency
From simple to complex tasks	SP	sig. lower*	sig. lower	sig.lower
	OP	non-sig.	sig. lower	sig.lower
	JP	sig. higher	sig. higher	sig.lower
	NP	non-sig.	non-sig.	sig.lower

*Sig.lower/higher= from the simple to complex tasks, the measure significantly decreases/increased. Nonsig = not significant.

As can be seen from Table 6, the fluency of all groups significantly decreased in the complex task. The complexity and accuracy of the SP group significantly reduced, and those of the JP group significantly augmented. Following Skehan (2014), a Pearson product-moment correlation was run to assure the relationship between accuracy and complexity in the JP group. The results revealed that based on Cohen (1988), the correlation between complexity and accuracy was significantly strong and positive, i.e., $r = .595$, $n = 20$, $p = .006$. Figure 1 illustrates the findings.

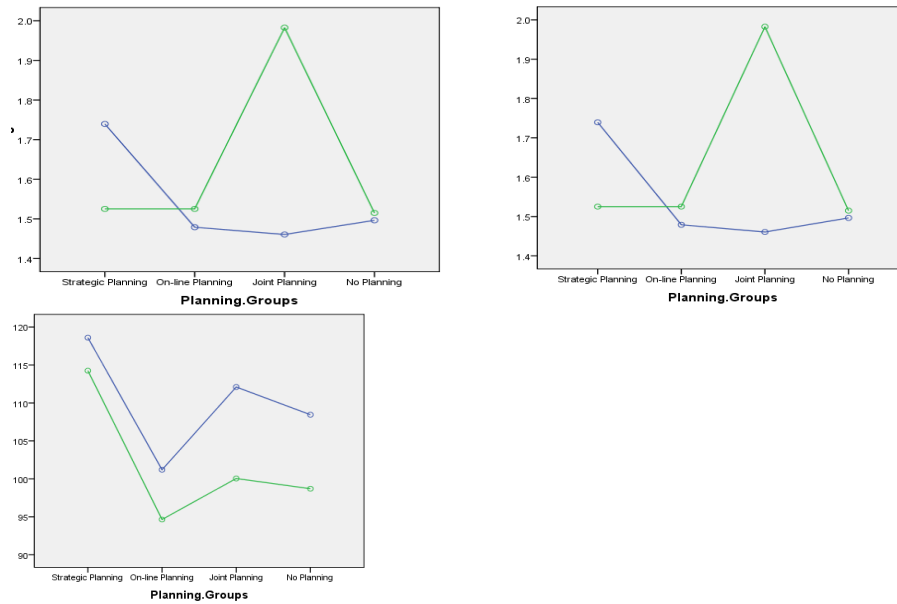


Figure 1. The performance of learner the groups across task complexity in terms of complexity, accuracy, and fluency respectively (blue line=simple task; green line=complex task).

Discussion

The present study was an attempt to shed some light on the planning dimension of TBLT from an angle which has not enjoyed researchers' proper attention: joint planning which is the combination of pressured online and strategic planning types. The present study put joint planning under the spotlight and made a comparison between four task planning conditions: joint planning (strategic combined with online), strategic planning, pressured on-line planning, and no-planning as the control group across task complexity.

The discussion section, in what follows, is divided into different parts each comparing joint planning with the other planning conditions one at a time in two simple and complex tasks.

Simple task

Joint planning versus strategic planning. The first comparison is made between joint planning group (JPG) and strategic planning group (SPG) and as illustrated in the previous section the complexity in the SPG was significant, while it was not significant in the JPG. Regarding accuracy, the participants in the JPG outperformed those of SPG

significantly. As for fluency, both groups had significant results, although the mean of SPG was higher.

These findings can be explicated on several grounds. Firstly, as far as strategic planning is concerned, Ellis (2009) argues that it enhances conceptualization in terms of Levelt's (1989) model, and the lighter burden of conceptualization in its own turn, Foster and Skehan (1996) predict, can lead to improvements in complexity and fluency. The present study completely accords with their predictions on both complexity and fluency and the findings are in line with other studies in the literature (Mehnert, 1998; Mochizuki & Ortega, 2008).

Nonetheless, when strategic and online planning joined forces in the JPG the prediction for enhanced complexity was not confirmed and was replaced by improved accuracy, though fluency remained significant. It seems that when learners were given the chance to plan ahead in the SPG, they conceptualized an internal plan, in Levelt's (1989) terms, and the devised plan remained intact in the formulation and articulation phases since the learners did not have any time for online planning which resulted in complex production, while when they had time for both pre- and while-task planning in the JPG their internal speech changed and lost its complexity and gained more accuracy instead due to enjoying the opportunity for having time to plan while speaking and in light of more time for monitoring. In other words, in the JPG the influence exerted by online planning outweighed that of strategic planning resulting in more accurate language meaning that when learners have time to think while they are speaking their working memory has the opportunity to access the syntactic information and monitor the output which can justify the improved performance of the JPG with respect to accuracy (Yuan & Ellis, 2003). This shift of attention from complexity towards accuracy is also in line with the explanation put forward by Ellis (2009) according to which "the demands of on-line production may sometimes override the benefits accrued from strategic planning" (p. 498).

The findings of the present study thus far provide support for Skehan's (1998, 2009) Trade-off Hypothesis since the learners could not pay heed to accuracy and complexity at the same time in the case of narrative simple task (Ellis, 2005). That is, when learners took risk to

push at the boundaries of their comfort zone their accuracy suffered, and when they focused on controlling their resources to solidify accuracy, their complexity suffered.

Concerning fluency, both JPG and SPG had significant performances. This was predictable since both groups had the chance to plan ahead or in Levelt's (1989) terms conceptualize and devise an internal speech which assisted them in the formulation and articulation phases resulting in significant fluency (Foster & Skehan, 1996). The mean in SPG's fluency was, however, higher than that of JPG's. It seems that since the participants in the SPG did not plan while carrying the task out they performed it more fluently, but the participants in JPG were slowed down with online planning. This justification accords with the dominant belief in the literature that online planning proves costly for fluency and slows learners down since with respect to Skehan's (1998) cognitive approach when provided with the opportunity for during-task planning, learners bring their rule-based system to the fore and hold their exemplar-based system back which led the JPG to have a lower mean of fluency compared to SPG.

Joint planning versus online planning. The second comparison is made between joint planning group (JPG) and online planning group (OPG) and as illustrated above, neither JPG nor OPG had a significant performance as far as complexity is concerned. Regarding accuracy, the participants in both JPG and OPG had a significant performance, although the latter had a higher mean. As for fluency, the JPG had a significant performance, whereas the OPG did not.

The effects of online planning on fluency is the clearest of all compared to accuracy and complexity, since given learners' focus on formulation and rule-based system, it is plausible to foresee a decrease in fluency which held for the present study in OPG resulting in an insignificant fluency in line with other studies (Ellis, 2005; Yuan & Ellis, 2003; Ellis, 2009).

Regarding the influence of during-task planning on accuracy and complexity of oral production, studies have found a benefit for both, although limited (Ahmadian & Tavakoli, 2010; Ellis & Yuan, 2004; Yuan & Ellis, 2003). Nonetheless, according to Ellis (2005) accuracy is more probable to enjoy more improvement, as it did in the present

study, since “within-task planning may prove beneficial to formulation and also afford time for the controlled processing required for monitoring. As a result, accuracy might increase” (Ellis, 2005, p. 14). The OPG’s elevated accuracy can also be explained drawing on Levelt’s (1989) model which argues planning assists learners in the formulation stage since they have time to choose the structures they want to translate their conceptualization into. More precisely, online planning is hypothesized to assist learners in three ways: 1) it helps them to access their grammatical resources during speaking more carefully; 2) it expedites the process of monitoring before production; and 3) it helps learners monitor their production after their production (Hsu, 2015; Yuan & Ellis, 2003). In terms of Skehan’s (1998) cognitive approach, through online planning, learners draw on their rule-based system rather than their lexical system (Ellis, 2005). However, the lower mean of JPG’s accuracy and their significant performance with reference to fluency can be due to the fact that since they had the chance to plan their speech before embarking upon the task, they already had a plan or internal speech as a result of conceptualization which led them to quicken their pace, while doing the task, at the cost of a few more errors compared to OPG.

The absence of any effect for complexity can be due to various reasons. To put it in Geng and Ferguson’s (2013) terms “[T]his may be because the effects of planning are mediated by task type, learner proficiency level, and learner orientation while planning” (p. 983). Among these three factors, task type seems to be the most pertinent one in the present study. Since the participants were performing a simple task, they did not think about the relationship between pictures resulting in less use of hypotactic language such as subordinate clauses which led to a less complex production (Geng & Ferguson, 2013).

Joint planning versus no-planning. No-planning group (NPG) acted as the control group in the present study and neither did they have time for planning prior to nor while performing the task. The reason behind the existence of this group in the design of the study, in the first place, is that as Ellis (2009) argues interpreting the results of the planning studies in which there is not any control group is very difficult since the dearth of a control group makes the comparison amongst the

groups very demanding if not impossible. In other words, the participants of this group did not have the opportunity to conceptualize before the task, in Levelt's (1989) terms, and they did not have a proper amount of time for formulation, either. As predicted, their performance was not significant in terms of complexity and accuracy since they are closely intertwined with conceptualization and formulation. As for fluency, their performance was significant, although the mean of their fluency was the lowest amongst the four groups in the simple task. These findings chime with the results of Li, Chen, and Sun (2014). The slight significance of NPG regarding fluency can be justified on the ground that since the task was simple, formulating the story did not occupy their whole attentional capacity so that they could formulate and articulate the story rather fast.

The presence of the control group illustrates that the results elaborated above in the other three groups are due to planning types adopted in each group.

Complex task

Joint planning group versus strategic planning group. The joint planning group (JPG) had a significant performance in both complexity and accuracy but not in fluency. On the other hand, the strategic planning group (SPG) had a significant performance only regarding fluency.

The performances of both the SPG and OPG deteriorated as the task gained more complexity in line with predictions in the literature (Skehan & Shum, 2014). However, this prediction did not hold for the JPG since they had the opportunity to plan both prior and while performing the task and apparently this dual opportunity offset the influence of task complexity with the reorientation of participants' focus from fluency towards complexity and accuracy. That is to say, the simple task led the participants in the JPG to have an elevated performance in terms of accuracy and fluency; however, as the task became complex the participants gave the priority to accuracy and complexity to the detriment of fluency. Some explanation is in order at this point regarding the significant complexity and accuracy and insignificant fluency.

Regarding the significant complexity, as Skehan and Shum (2014) argue when the task is complex, learners need to use more subordinate clauses in order to relate the pictures that results in elevated complexity. Furthermore, since the participants had the chance to plan before the task they could conceptualize, in Levelt's (1989) terms, so that they had a good head start as for complexity (Ellis, 2005, 2009). In other words, to put it in Wang and Skehan's (2014) terms "tasks which require information manipulation (i.e. those requiring the creation of a storyline to link a series of pictures) [the same as the present study] ...are more difficult, but are associated with greater language complexity" (p. 156).

With regards to accuracy, since the participants had the opportunity to plan while doing the task they had access to their rule-based model (Skehan, 1998) and they could monitor their performance which was the case in both simple and complex tasks and since "speech monitoring is the key to accuracy" (Wang, 2014, p. 51), the participants' accuracy improved. The final explanation can be simply put in Wang and Skehan's (2014) terms who assert that "influences which singly might elevate performance in a single direction may, when operative together, raise performance in more than one area" (p. 156).

Drawing on Levelt's (1989) speech model, the differences between the performance of SPG and JPG can be explicated with a particular focus on the formulation stage since the differences between the mentioned groups can be traced back to this stage since both groups had the chance to plan before the task so as for conceptualization they were the same. According to this model, in the articulation stage learners first access their lexicon then their syntax (Levelt, 1989; Kormos, 2006). When the participants started performing the task, the SPG did not have any time for online planning and since the task was difficult and they had to think about relating the pictures together they opted for fluency which was the result of accessing the mental lexicon first rather than syntax. This earlier access to lexicon led fluency to come to the fore and complexity and accuracy to be less paid heed to. However, although the JPG accessed the lexicon first too, since they were not under any time pressure to complete the task, as a result of online planning, they gained access to their syntax and produced more complex and accurate speech to the detriment of fluency. It is noteworthy that the simultaneous

significant accuracy and complexity of the present study accord with the findings of several studies (Foster & Skehan 1999, 2013; Tavakoli & Skehan 2005). At the first glance, due to significant results of both accuracy and complexity, it might be believed that, the findings of the present study are providing support for Robinson's (2001, 2011) Cognition Hypothesis. However, as Skehan (2009) argues in order for the simultaneous raised complexity and accuracy to support Robinson's (2001, 2011) Cognition Hypothesis, the two variables, complexity and accuracy, should be correlated, otherwise it is highly probable that some learners have raised accuracy and some others complexity. The correlation results of the present study, as illustrated in the previous chapter, show that complexity and accuracy are not significantly correlated so that the results of the present study fail to add support to Robinson's (2001, 2011) Cognition hypothesis.

As for fluency of the JPG, which was significant in the simple task but not in the complex one, apparently task structure has a clear effect on the speed at which the learners could perform the task since the participants in the simple task did not need to allocate any special attentional capacity to relating the pictures to each other which helped them with their fluency. Nevertheless, regarding the complex task, since they needed to pay heed to the relationship between the pictures and sequencing them, they had to lower their speed.

As mentioned above, the SPG performed significantly only in terms of fluency which was contrary to SPG of the simple task since they did significantly regarding complexity too. The deterioration of complexity is explicable since it is in line with Skehan's (1998, 2009) Trade-off Hypothesis. According to Wang and Skehan (2014) "the fundamental assumption is that if tasks become more difficult, the significance of attentional and memory limitations becomes greater" (p. 156). This assumption in the present study meant that when the participants were performing the complex task, they had to allocate a great amount of their attentional capacity to sequencing the pictures and relating them together, and since they did not have any time to think while they were performing the task, their internal speech which they had planned prior to performing the task changed since they were under time pressure in the formulation stage and they could not produce complex enough

language to meet the requirements of a significant complexity. On the other hand, the JPG of the complex task, as explicated above, had time to think and plan while doing the task in addition to the time they had before the task which meant that their internal speech preserved its complexity since they had enough time for formulation.

Joint planning group versus online planning group. The online planning group's (OPG) performance in both complex and simple tasks was similar meaning that their results were significant only in terms of accuracy. However, there was a small difference; the mean of accuracy in the complex task was lower than that of simple task. This was predictable since the task became more complex so that the participants had to allocate a larger amount of attentional capacity to sequencing the pictures of the task compared to the participants of the same group in the simple task which meant less attentional capacity for monitoring.

The findings of the present study in the complex task, in both strategic planning and online planning, accord with Skehan's Trade-off Hypothesis (1998, 2009). This hypothesis argues that complexity and accuracy are in conflict and usually they improve to each other's detriment due to limited attentional capacity unless this limited capacity is mitigated by means of optimal choice of planning (Skehan & Foster; 1997; Skehan & Wang, 2014; Wang, 2014), which was the case in the JPG of the present study.

Joint planning group versus no-planning group. The no-planning group (NPG) of the complex task was the control group as it was in the simple task. Contrary to their significant performance regarding fluency in the simple task, the participants of NPG of the complex task could not have any significant results which is plausible given the complex nature of the task. In other words, since the participants of this group did not have any time for planning neither prior to nor while performing the task, they did not have a proper amount of time for conceptualization or formulation meaning that they could not produce a language capable of meeting the requirements of significant complexity, accuracy, or fluency.

JPG in the simple task versus JPG in the complex task. With reference to complexity and accuracy, the JPG in the complex task performed in both significantly, but the JPG had a significant

performance only regarding accuracy in the simple task. Some explanation is in order in this respect. According to Tavakoli and Foster (2011) “syntactic complexity was supported by narrative storyline complexity and grammatical accuracy was supported by an inherently fixed narrative structure” (p. 37). In other words, according to Tavakoli and Foster (2011), a simple task leads to improved accuracy and a complex task results in enhanced complexity. The improved accuracy in JPG of the simple task is in line with Tavakoli and Foster’s (2011) findings and the significant complexity in JPG of the complex task, also, accords with their postulation; however, the improved accuracy in the latter runs counter to their findings which can be explicated based on the combined effects of strategic and online planning. In other words, it seems that, although strategic and online planning do not have an accumulative effect on accuracy and complexity in the simple task, they do in the complex task. One of the contributing reasons in this respect is that, in the simple task, because of the clear storyline, the participants did not need to pay attention to connecting the pictures so that they became more fluent and accurate (Tavakoli & Foster, 2011). However, as for the complex task, they had to discover the relationship between the pictures in order to be able to complete the task so that fluency decreased and the attempt to relate the pictures resulted in more use of hypotactic language such as subordinate clauses using for example while and although which led to more complex language under the effect of strategic planning, and at the same time since they had the opportunity to plan online, they could monitor the result of their strategic planning so that their language enjoyed a significant amount of accuracy, although to the detriment of fluency (Geng & Ferguson, 2013, Skehan & Shum, 2014).

Conclusions

The study compared four different planning types across task complexity aiming to enrich our understanding of the effect of different planning types on learners’ CAF. Regarding the pedagogic implications of the present study, if the task is simple both joint planning and strategic planning are efficient and the choice depends on the focus of the task in a real pedagogic context, meaning that with choosing the former the teacher can orientate students’ attention towards accuracy and fluency and with picking the latter students’ focus will switch and

be drawn towards accuracy and complexity. On the other hand, with reference to a complex task, apparently joint planning is the best option since it can boost accuracy and complexity simultaneously, unless the teacher intends to implement a fluency practice in which case strategic planning will be the optimal choice. The choice of the correct type of planning for the specific intended outcomes (i.e., elevated complexity, accuracy, or fluency) is explicable with reference to the Trade-off Hypothesis (1998, 2009) since “Trade-off is a fundamental constraint, and then a major contribution of task research is to explore how task characteristics and task conditions can mitigate its effects” (Wang & Skehan, 2014, p. 156).

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