

The Effects of Sequencing Order and Modality on Fluency, Complexity, and Accuracy in L2 Oral and Written Narrative Performance

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Abstract

A number of studies have investigated the effects of planning on fluency, complexity, and accuracy of L2 learners' performance. Most previous research has examined the impact of strategic planning on oral production (e.g., Foster & Skehan, 1996; Ortega, 1999), and two studies (Ellis, 1987; Ellis & Yuan, 2005) have analyzed the effects of strategic and online planning on oral and written output. The study reported here investigated the effects of extended online planning on oral and written narratives performed in a sequence. The results show that extended online planning had little effect on oral performance, while it had some effect on written performance. Modality had a great impact on narrative performance. The oral production was more fluent than the written production, but less complex and less accurate. These findings indicated that the sequencing order of speaking first and then writing may be more effective than the reverse order for L2 learners in task-based narrative performance under time pressure.

Keywords: planning, modality, fluency, complexity, accuracy

キーワード：プランニング，モダリティ，流暢さ，複雑さ，正確さ

INTRODUCTION

Planning

Task planning has attracted considerable attention in the study of L2 learners' production of tasks. A number of researchers have studied the effects of planning time on three dimensions of L2 performance: fluency, complexity, and accuracy. Planning conditions are strategic planning, which learners have planning before doing a task, and online planning, which

takes place while doing a task. Many of the studies have investigated the effects of strategic planning on oral narratives (e.g., Foster & Skehan, 1996; Gilabert, 2007; Kawauchi, 2005; Ortega, 1999), and Yuan and Ellis (2003) examined the effects of both strategic and online planning on oral narrative production. Only Ellis(1987)and Ellis and Yuan (2005) have investigated the effects of strategic and online planning on both oral and written narratives.

Ellis (2009) summarizes a total of 19 studies which investigated the effects of strategic planning on L2 task-based performance in terms of fluency, complexity, and accuracy. Most of these studies reported that the strategic planning had positive effects on fluency, whereas effects on complexity and accuracy were positive in some studies but negative in other studies.

Effects of Planning

Foster and Skehan (1996) analyzed the effects of different planning conditions and tasks eliciting different discourse types. They reported that planning had strong effects on fluency and clear effects on complexity, but effects on accuracy were complex. Planning was associated with greater complexity in less cognitively demanding tasks than in a demanding task. The effects of planning on accuracy were greater in less familiar tasks than in a familiar task. The results of the study supported trade off effects between complexity and accuracy.

Ortega's study (1999) had two aims; one was to examine the effects of strategic planning on linguistic quality of advanced learners of Spanish, and the other was to find out what learners actually do while they plan. The results showed that planning increased fluency and syntactic complexity but had no effects on lexical range. The findings regarding grammatical accuracy were mixed. The retrospective interviews suggested that the learners paid attention to form during planning and planning promoted the learners' conscious focus on form.

Kawauchi (2005) focused on planning effects and different proficiency levels. Strategic planning benefited fluency and complexity for high EFL students, and it increased accuracy of low EFL students. For advanced EFL students, however, planning had few beneficial effects. These results indicated an interaction between planning conditions and proficiency levels.

Gilabert (2007) aimed to investigate how cognitive complexity of tasks and planning conditions affect production. Planning had a significant impact on fluency and lexical complexity but not on structural complexity or accuracy. Cognitively complex tasks generated accuracy but not complexity. He suggested that fluency should be considered to be separated

from complexity and accuracy, and that accuracy and complexity draw on different resource pools and can be attended to simultaneously, supporting the multiple-resource approach (Robinson, 2003).

Elder and Iwashita (2005) conducted their planning study in a testing context. The provision of planning time had no effects on fluency, complexity, or accuracy. They also failed to find any impact of planning on test takers' perceptions of task difficulty or task enjoyment. The results disagreed with those of the previous research in classroom or laboratory contexts.

Tavokoli and Skehan (2005) also carried out their study in a testing environment, and had different results than Elder and Iwashita. Performance under planned conditions led to a significant increase in fluency, complexity, and accuracy. There was an interaction between planning and proficiency level. Planning was more effective for learners in an elementary level than those in a higher level. The learners with planning found tasks less difficult than those without planning.

The previous research had focused on strategic planning, and online planning had not been studied. Yuan and Ellis (2003) presented the distinction of the two planning conditions. Strategic planning is provided before a task and speakers plan content and form of an upcoming task; whereas online planning is "the process by which speakers attend carefully to the formulation stage during speech planning and engage in pre-production and post-production monitoring of their speech acts" (p. 6). They found that the strategic planning group was more fluent and richer in lexical variety, but less accurate than the online planning group.

Ellis and Yuan (2004) expanded their study from speaking to writing. Strategic planning was found to be more fluent and greater complex in verb forms, but less accurate than online planning. However, the difference in accuracy was not statistically significant. In their experiment, the total time for doing the task was longer for the strategic group than the online group, and therefore it couldn't be concluded that strategic planning was more efficient than online planning.

Effects of Planning on Oral and Written Narratives

Ellis (1987) first examined effects of planning on both oral and written narratives. The results showed that the learners produced more accurate products in writing than in speaking. However, planning conditions were different in speaking and writing. As Crookes (1989)

pointed out, planning condition and modality were conflated, and it was impossible to conclude whether the participants' accuracy was affected by planning or modality. Ellis examined accuracy only in terms of past tense morphemes and did not investigate fluency or complexity.

Ellis and Yuan (2005) examined the effects of online planning on L2 learners' oral and written narratives for three variables: fluency, complexity, and accuracy. They found that in both speaking and writing, the unpressured online planning resulted in greater syntactical complex and more accurate language in comparison to the pressured online planning; there was, however, no significant difference for fluency or lexical variety. Concerning modality, the written products were less fluent but more complex and more accurate than oral products in both pressured and unpressured planning conditions. From these results, they concluded that online planning condition and modality independently affect L2 learners' performance.

To date, most of the studies on planning have investigated speaking alone, and a few have examined writing. Ellis (1987) and Ellis and Yuan (2005) analyzed the both, but some participants had either an oral task or a written task. No studies have investigated oral and written narratives performed in a sequence by the same participants. The sequencing order can be related to planning. Strategic planning is done in advance of performance, while online planning is carried out during performance. When learners do an oral task and a written task in the sequence of planning-speaking-writing (P-S-W), P is strategic planning and S (oral task) can be considered as extended online planning to prepare for W (written task). S is online planning because learners plan while speaking and make use of it for W. On the other hand, in the sequence of planning-writing-speaking (P-W-S), W can be considered extended online planning which occurs prior to S. It is possible that written production in the P-S-W sequence will be more fluent, complex, and accurate than in the P-W-S sequence, because the P-S-W learners have S prior to W and can make use of S as extended online planning for W. In contrast, oral production in the P-S-W sequence will be less fluent, complex, and accurate than in the P-W-S sequence, because the P-S-W learners have no extended online planning for S. In the study of task-based performance, it would be important to examine speaking and writing in a sequence and answer the following questions: Does the sequencing order affect fluency, complexity, and accuracy of oral and written performance of L2 learners? Which sequencing order is more effective, speaking-writing or writing-speaking? Furthermore, does the modality have any effects on fluency, complexity, and ac-

curacy of L2 learners' production?

Research on planning in task-based performance has mainly conducted on oral production, and the literature on tasks "assumes that tasks are directed at oral skills, particularly speaking" (Ellis, 2003, p. 7). In class, oral and written skills are used for task performance, and choice of these two skills as well as sequencing order is deliberately and flexibly adopted according to goals to achieve, learners' needs and proficiency levels, classroom situations, materials to be used, etc. Polio and Williams (2009) note, "...teachers can use writing to promote other skills" (p. 487); and it is possible to say that speaking can be used to develop other skills. Weissberg (2006) also considers "the written and oral modalities as inextricably linked developmentally for many learners..." (p. 2). The relationship between speaking and writing is important in task-based language learning and teaching.

THE STUDY

Research Questions

This study was designed to answer the following two questions:

1. What effects does sequencing order, i.e., speaking-writing vs. writing-speaking, have on fluency, complexity, and accuracy of L2 learners' oral and written narrative performance?
2. What effects does modality, i.e., speaking vs. writing, have on fluency, complexity, and accuracy of L2 learners' narrative performance?

Design

Table 1 shows the experimental design for the study. Participants had five minutes for strategic planning (P). At Time 1, Group 1 did an oral task (S) and a written task (W) in the sequence of planning-writing-speaking (P-W-S). "W" is considered as "extended online planning" (eop) to prepare for "S" because the subjects have "online planning" while doing "S"; and this condition is shown as Speaking 1 W-S[+eop writing] (hereafter W-S[+eop w]). Group 2 did the same oral and written tasks in the reverse sequence, planning-speaking-writing (P-S-W); they did not have "W" (i.e., no extended online planning) prior to "S", and this condition is shown as Speaking 1 S-W[-eop writing] (hereafter W-S[-eop w]). At Time 2, the sequencing order of oral and written tasks was reversed so as to counterbalance the sequencing order of the two experimental conditions.

Table 1 Design of the study

		Time 1					
		Topic A					
		Group 1 (n=46)			Group 2 (n=53)		
Sequence	Planning	→	Writing 1	→	Speaking 1	→	Writing 1
Time	5 minutes		5 minutes		5 minutes		5 minutes
Condition			Speaking 1		W-S [+eop writing]		Speaking 1
			Writing 1		W-S [-eop speaking]		Writing 1
							S-W [-eop writing]
							S-W [+eop speaking]
		Time 2					
		Topic B					
		Group 1 (n=46)			Group 2 (n=53)		
Sequence	Planning	→	Speaking 2	→	Writing 2	→	Speaking 2
Time	5 minutes		5 minutes		5 minutes		5 minutes
Condition			Speaking 2		S-W [-eop writing]		Speaking 2
			Writing 2		S-W [+eop speaking]		Writing 2
							W-S [+eop writing]
							W-S [-eop speaking]

eop = extended online planning

Participants

The participants were 99 first-year undergraduate students who were English majors at a private university in Tokyo. Most of the students had been learning English as a foreign language for six years at high school in Japan. Their proficiency level was between low intermediate to intermediate. They were all in Level 1 of the Integrated English Program. Six teachers cooperated with the study and voluntarily offered their classes to the experiment. Each class size was from 14 to 20. The experiment was conducted in the first semester, 1.5 to 2 months after the participants entered university during normally scheduled class time. The researcher introduced tasks and collected data in the presence of the teacher of each class.

Tasks

Monologic narrative with personal information was chosen as a task because it is easier and more accessible to learners than narrative based on pictures (Foster & Skehan, 1996). Information is well-known to the participants, and familiarity enables them to structure performance and access stored linguistic knowledge of the L2 for use in production. Furthermore, in doing monologic narrative tasks, individual learners are able to control their own performance and are not influenced by other participants as they are doing interactional tasks (Yuan & Ellis, 2003).

Two similar topics were chosen to make the tasks equivalent. The topic was “My best day or thing since I entered university” in the first session, and “My worst day or thing since I entered university” in the second session.

The participants were provided with 5 minutes for strategic planning, although the majority of the previous studies allocated 10 minutes. The tasks in the previous studies were producing narratives based on a series of pictures, which were cognitively and linguistically more demanding than the narrative task based on personal experience. Tavakoli and Skehan (2005) demonstrated that planning for 5 minutes positively affected fluency of the learners, and Mehnert (1998) found that only 1 minute of planning time enhanced her speakers’ fluency.

The same length of time was allocated for each oral and written task, although speaking is faster than writing. If the amount of time is different across modality, it would be impossible to conclude whether performance was affected by time or modality. In addition, telling a personal story is not demanding either cognitively or linguistically, and so it does not take learners long to do a task.

The instructions and topics for the tasks were given in Japanese. Students were told that they would have two sessions of 15 minutes for each. First they would have 5 minutes to think about the topic, and then they would have oral and written tasks on the same topic for 5 minutes each; after a ten-minute break, they would have another session to do tasks on a different topic in the reverse sequencing order of the first session. They were informed that they could make notes if they wished while planning but would not be able to keep their notes during their performance.

The oral data was audio recorded in a language laboratory, and written data on a piece of paper was collected immediately after performance. Students were told not to erase any words but to cross out any mistakes, unnecessary words, slip of the pen, etc., and make corrections next to the parts they had crossed out. They were asked to speak and write as much as possible, but a minimum number of words produced was not required.

Measures of Performance

Audio-recorded data were transcribed by two native speakers who were studying as exchange students at the same university where the experiment was conducted, and checked by the author. The oral data were pruned, excluding false starts, fillers such as “hm”, “um”, and “uh”, repetitions, and self-corrections. Hand-written data were typed, and crossed-out

words were excluded. These pruned oral and written transcripts were used to measure fluency, complexity, and accuracy.

For fluency measures, the number of words per minute (WPM) and the number of words per AS-unit (WPAS) were used. AS-unit is a speech unit for analysis of performance. The definition is “a single speaker’s utterance consisting of *an independent clause*, or *sub-clausal unit*, together with any *subordinate clause(s)* associated with either.” (Foster, et al. 2000, p. 365) Disfluency, which is the percentage of words of self-repairs, repetitions crossing out, etc., was also included to examine fluency.

For complexity measures, the number of S-nodes per AS-unit (SPAS) was used for structural complexity. S-nodes are any embedded clauses in each AS-unit; and a greater proportion of S-nodes indicates a greater degree of subordination and embedding. Regarding lexical complexity, type-token ratio (TTR) was calculated. The longer the narrative, the lower TTR tended to become. Therefore to control the length of production, TTR in the first 50 words was used since the total number of words in oral production was much greater than that of written one.

For accuracy measures, the percentage of error-free AS-units (EFAS) was used as a general measure. All errors in syntax, morphology, and word choice were included, and the percentage of AS-units that did not contain any error was calculated. The percentage of target-like use (TLU) of past tense verb forms (copula *be*, regular verbs, and irregular verbs) in obligatory occasions was used as another measure for accuracy.

Data Analysis

The author analyzed all of the data using the seven measures, and the reliability was determined by a native speaker of English who has ESL background and has been teaching in Japanese universities for more than 15 years. The native speaker examined a randomly selected sample of 30% of the total data in each task condition for each measure. The results of inter-rater agreement were 98.75% for WPAS, 98.00% for SPAS, 99.32% for TTR, 93.14% for EFAS, and 97.51% for TLU. Intra-rater reliability was also calculated with a randomly selected sample of 30% of the data. The lowest intra-rater agreement reached 95.45% for EFAS.

A series of one-way ANOVAs were performed to test for statistical significance of differences between task conditions for the six measures and followed by Scheffe’s multiple comparisons. In cases where data was not normally distributed, Kruskal-Wallis tests were per-

formed and followed by Scheffe’s multiple comparisons.

RESULTS

Sequencing Order

The fluency, complexity, and accuracy of the oral narratives were analyzed to examine whether the sequencing order has effects on the learners’ performance. Table 2 presents a summary of the descriptive statistics for the six measures in the four task conditions of oral narrative performance and the results of one-way ANOVAs or Kruskal-Wallis tests. In Speaking 1, Group 1(W-S[+eop w]) had slightly higher mean scores than Group 2 (S-W [-eop w]) for the measures of WPM and WPAS, but not for Disfluency, SPAS, TTR, EFAS, or TLU. In Speaking 2, Group 2 (W-S[+eop w]) had slightly higher mean scores than Group 1 (S-W[-eop w]) for TTR, EFAS, and TLU; whereas, for the other four measures, the mean scores of Group 2 were lower than Group 1. The ANOVA and Kruskal-Wallis tests failed to show that the differences were statistically significant in the case of the six variables. The planning conditions (i.e., whether or not the participants had extended online planning) had little effect on their oral performance. In other words, the sequencing order of modality (i.e., speaking-writing vs. writing-speaking) did not have any effect on the oral narratives.

The written products were examined in the same way as the oral analyses. Table 3 shows a summary of the descriptive statistics for the six measures. A series of ANOVAs or

Table 2 Descriptive statistics for fluency, complexity, and accuracy of oral narratives and results of ANOVA or Kruskal-Wallis test

Conditions Measures	Speaking 1		Speaking 2		F/χ^2	<i>P</i>	
	Group 1 (n=46)		Group 2 (n=53)				
	W-S [+eop w] Mean (SD)	S-W [-eop w] Mean (SD)	S-W [-eop w] Mean (SD)	W-S [+eop w] Mean (SD)			
Fluency	WPM	38.31 (11.99)	34.99 (10.79)	40.26 (14.43)	37.09 (10.70)	1.64	.181
	WPAS	8.90 (1.40)	8.32 (1.31)	8.78 (1.28)	8.60 (1.49)	1.65	.178
Disfluency		16.78 (9.18)	19.78 (9.58)	20.06 (8.73)	18.65 (8.48)	1.29	.280
Complexity	SPAS	1.22 (0.15)	1.22 (0.15)	1.27 (0.16)	1.26 (0.15)	1.39	.247
	TTR	0.70 (0.05)	0.70 (0.07)	0.67 (0.07)	0.71 (0.06)	2.54	.058
Accuracy	EFAS	41.13 (11.49)	41.24 (11.89)	39.76 (10.64)	42.68 (14.42)	0.46	.712
	TLU	78.29 (16.72)	80.77 (18.01)	72.61 (18.37)	74.44 (24.26)	5.90	.117

WPM=number of words per minute, WPAS=number of words per AS-unit, SPAS=number of S-nodes per AS-unit,

TTR=type token ratio of words, EFAS=percentage of error free AS-unit,

TLU=percentage of target like use of past copula, regular past, and irregular past

Table 3 Descriptive statistics for fluency, complexity, and accuracy of written narratives and results of ANOVA or Kruskal-Wallis test

Conditions Measures		Writing 1				Writing 2				F/χ^2	P
		Group 1 (n=46)		Group 2 (n=53)		Group 1 (n=46)		Group 2 (n=53)			
		W-S [+eop w] Mean	(SD)	S-W [-eop w] Mean	(SD)	S-W [-eop w] Mean	(SD)	W-S [+eop w] Mean	(SD)		
Fluency	WPM	14.54	(3.69)	14.94	(3.44)	18.59	(4.32)	15.62	(3.35)	11.28	.000
	WPAS	9.23	(1.74)	9.30	(2.27)	8.66	(1.77)	8.68	(2.30)	1.36	.255
Disfluency		5.28	(3.82)	4.71	(2.91)	3.61	(4.36)	4.96	(4.33)	9.13	.027
Complexity	SPAS	1.37	(0.26)	1.35	(0.26)	1.32	(0.22)	1.34	(0.31)	0.19	.900
	TTR	0.72	(0.07)	0.74	(0.07)	0.71	(0.06)	0.74	(0.05)	7.54	.056
Accuracy	EFAS	50.34	(16.78)	47.12	(18.49)	51.81	(15.01)	41.25	(17.12)	3.74	.012
	TLU	87.62	(12.56)	83.37	(21.52)	89.94	(10.91)	79.49	(25.37)	2.84	.417

WPM=number of words per minute, WPAS=number of words per AS-unit, SPAS=number of S-nodes per AS-unit,

TTR=type token ratio of words, EFAS=percentage of error free AS-unit,

TLU=percentage of target like use of past copula, regular past, and irregular past

Kruskal-Wallis tests were conducted, and the results showed that there was a significant difference between the groups for WPM ($F=11.28, p=.000$), Disfluency ($F=9.13, p=.027$), and for EFAS ($F=3.74, p=.012$). The Scheffe tests were performed to explore where the significant differences were located across the task conditions. The Scheffe result for WPM ($p=.002$) showed that the Group 1 (S-W[+eop s]) wrote more fluently than Group 2 (W-S[-eop s]) in Writing 2. The Scheffe result for EFAS ($p=.027$) also showed that Group 1 was more accurate than Group 2 in Writing 2. These results indicated that the speaking-writing sequence produced more fluent and more accurate written narratives than the writing-speaking order at Time 2.

Modality

The data of Group 1 and Group 2 were combined to examine the modality difference in the same conditions. As the study design in Table 1 presents, Speaking 1 and Writing 1 at Time 1 had the same topic and task condition; and Speaking 2 and Writing 2 at Time 2 were conducted by the same participants on the different topic from Time 1 but in the same task condition.

Table 4 shows descriptive statistics for fluency, disfluency, complexity, and accuracy of the spoken and written languages, and the results of ANOVA or Kruskal-Wallis test. The results showed that differences across the groups were statistically significant for all the seven measures. The Scheffe tests were performed to examine differences between the two modalities, and the results are shown in Table 5.

Table 4 Descriptive statistics for fluency, complexity, and accuracy of the two modalities and results of ANOVA or Kruskal-Wallis test

Measures		Time 1				Time 2				F/χ^2	<i>P</i>
		Speaking 1		Writing 1		Speaking 2		Writing 2			
		(n=99)		(n=99)		(n=99)		(n=99)			
		Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)		
Fluency	WPM	36.54	(11.48)	14.75	(3.56)	38.56	(12.67)	17.00	(4.10)	270.25	.000
	WPAS	8.59	(1.38)	9.27	(2.04)	8.69	(1.40)	8.67	(2.07)	9.58	.023
Disfluency		18.53	(9.09)	4.39	(4.23)	19.17	(9.02)	4.84	(3.74)	236.80	.000
Complexity	SPAS	1.22	(0.15)	1.36	(0.26)	1.27	(0.16)	1.33	(0.27)	15.62	.001
	TTR	0.70	(0.06)	0.73	(0.07)	0.69	(0.07)	0.73	(0.06)	9.43	.000
Accuracy	EFAS	41.19	(11.70)	48.61	(17.79)	41.33	(12.89)	46.83	(16.44)	23.27	.000
	TLU	79.62	(17.47)	85.36	(18.01)	73.59	(21.74)	84.49	(20.49)	7.46	.000

WPM=number of words per minute, WPAS=number of words per AS-unit, SPAS=number of S-nodes per AS-unit, TTR=type token ratio of words, EFAS=percentage of error free AS-unit, TLU=percentage of target like use of past copula, regular past, and irregular past

Table 5 Modality difference

Measures		Time 1		Sheffe <i>P</i>	Time 2		Sheffe <i>P</i>
Fluency	WPM	Speaking	> Writing	.000	Speaking	> Writing	.000
	WPAS	Speaking	= Writing	.127	Speaking	= Writing	.752
Disfluency		Speaking	> Writing	.000	Speaking	> Writing	.000
Complexity	SPAS	Speaking	< Writing	.002	Speaking	= Writing	.865
	TTR	Speaking	< Writing	.004	Speaking	< Writing	.003
Accuracy	EFAS	Speaking	< Writing	.003	Speaking	< Writing	.028
	TLU	Speaking	= Writing	.239	Speaking	< Writing	.002

As for WPM, the participants clearly produced more words in speaking at both Time 1 and Time 2. Somewhat different results were obtained for WPAS; the Scheffe results of WPAS were not statistically significant between speaking and writing, but significant between Writing 1 and Writing 2. Concerning fluency, the modality difference was significant for WPM but not for WPAS. Speaking was more disfluent than writing. Differences in complexity were evident. As Table 4 presents, the students produced more structurally (SPAS) and lexically (TTR) complex narratives in writing than in speaking at both Time 1 and Time 2. From the results of Scheffe’s multiple comparison, writing was structurally more complex than speaking at Time 1, whereas there was no significant difference between speaking and writing at Time 2. In terms of lexical complexity, the written products were more complex than the oral products at both Time 1 and Time 2. Table 4 also displays the effects of modality on accuracy. The Scheffe results in Table 5 show that EFAS was higher in writing than in speaking at Time 1 and Time 2. In the case of TLU, the difference was

Table 6 A summary of correlations in time and modality

Measures		S1 & S2		W1 & W2		S1 & W1		S2 & W2	
Fluency	WPM	.80	**	.45	**	.38	**	.49	**
	WPAS	.39	**	.39	**	.59	**	.59	**
Disfluency		.42	**	.07		.07		-.02	
Complexity	SPAS	.32	**	.13		.55	**	.39	**
	TTR	.10		.11		.44	**	.46	**
Accuracy	EFAS	.35	**	.48	**	.46	**	.54	**
	TLU	.22	*	.49	**	.15		.66	**

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

statistically significant at Time 2, but not at Time 1. To summarize, modality affected the participants' narratives in fluency, disfluency, complexity, and accuracy. The oral production was more fluent and disfluent, but less complex and accurate compared to the written production.

Table 6 shows a summary of correlations in time and modality. Speaking 1 and Speaking 2 were highly correlated for WPM, and moderately correlated for WPAS, Disfluency, SPAS, EFAS, and TLU. These results indicated that the students who produced fluent, complex, and accurate oral narratives at Time 1 were likely to have fluent, complex, and accurate oral output at Time 2. As for writing, Writing 1 was significantly correlated to Writing 2 for WPM, WPAS, EFAS, and TLU; and this showed that the participants who were fluent and accurate in writing at Time 1 tended to be fluent and accurate in writing at Time 2. Correlations in the different modalities were also significant. Speaking 1 and Writing 1 were correlated for all measures except for Disfluency and TLU. The correlations between Speaking 2 and Writing 2 were significant for all measures except for Disfluency. These results suggested that the participants who were proficient speakers tended to be proficient writers.

DISCUSSION

Effects of Sequencing Order

The first research question of this study was whether the sequencing order (speaking-writing vs. writing-speaking) affects fluency, complexity, and accuracy of L2 learners' oral and written narrative performance. The results showed that the order did not affect the learners' oral production but had some effects on fluency and accuracy of their written production. I will examine why the sequencing order did not have great effects on the learners'

narrative performance with reference to planning and other causes.

In the present study, the participants had the planning-speaking-writing (P-S-W) sequence and the planning-writing-speaking sequence (P-W-S). Therefore, they were provided with both strategic planning (P) and extended online planning (S prior to W in the P-S-W sequence, W prior to S in the P-W-S sequence). Strategic planning and online planning have different roles. Strategic planning contributed to conceptualization of message content and selective attention to form, while unpressured online planning had little impact on message content but facilitated language choice in formulation (Ellis, 2005). Ellis and Yuan (2005) reported that pressured online planning produced less complex and less accurate performance in comparison to unpressured online planning, and concluded that online planning enhanced the formulation process when learners had ample time while doing a task. In the present study, 5 minutes was allocated to oral and written tasks and thus the learners had pressured online planning. In speaking and writing, the learners mainly devoted planning time to converting ideas into oral and written messages by retrieving and selecting lexical units, building syntactic structures, processing phonetic plans, and converting phonetic plans into actual speeches or graphemes. This process depends on language proficiency. From L2 writers' verbal protocol analyses, De Larios, Marin, and Murphy (2001) found that lower proficiency learners allocated more time to converting ideas into specific linguistic forms than higher level learners. The learners in the present study, who had limited language ability, seemed to have difficulty translating meaning into oral and written forms; as a result, extended online planning under time pressure did not greatly benefit their production.

Another possible cause concerning planning is the effect of strategic planning. The participants had 5 minutes for strategic planning, in which they thought about content to communicate and selected form to use in the task performance. They could write anything if they wished on a sheet of paper, although they could not look at it while performing. Studies to date have reported that strategic planning had positive effects on fluency and complexity, and sometimes on accuracy (Ellis, 2009; Ellis & Yuan, 2005). Strategic planning reduced cognitive load and communicative pressure, and helped the learner assess task demands and available linguistic resources (Ortega, 1999). As shown in previous studies, strategic planning could have helped the learners in this study perform oral and written narratives. Little effect of pressured extended online planning suggested that the learners might have depended on strategic planning rather than on extended online planning.

The nature of the topics also could have influenced planning. The participants did tasks

on the topics of the best and worst day/thing after entering university, which were monologic narratives based on personal experience. These tasks were chosen to make the learners express themselves without difficulty because they were not accustomed to speaking or writing. However, simple narratives and topics were sufficiently familiar to the students, so that the task topics might not have elicited complex performance. Narrative based on personal information is less cognitively and linguistically demanding than narrative explaining a series of pictures, giving reasons, or requiring decision making. As a result, planning has little effect on the way the learner performs a task. Robinson (2001) predicts that more complex tasks push the speaker to produce more lexically complex and more accurate language. With more complex and challenging tasks, the production in the present study would have been more affected by extended online planning, leading to differences in complexity and accuracy of the learners' narratives.

It is also significant to consider modality as a cause of little effect of extended planning. I will discuss this point in the next section.

Effects of Modality

The second research question was what effect modality has on L2 learners' narrative production. The results revealed that modality affected the learners' narratives in fluency, complexity, and accuracy. As shown in Table 4, the learners were more fluent in speaking than in writing, but less complex and less accurate. This result was the same as that of Ellis and Yuan (2005). In Ellis and Yuan's study, the length of time for speaking and writing was different, while the same length of time was allocated in the present study to do the oral and written tasks. In this condition, the speaking speed was 2 to 2.5 times faster than writing. The slower process of writing creates more space for writers to attend to form compared to the speaking process. In addition, writers have a record of their language which they can read and edit, whereas speakers have an aural trace that immediately fades away. These differences between the two modalities lead to the differences in language production.

Since speaking is a faster process than writing, it allows speakers to produce more content than writers in the same amount of time. Most of the learners in this study could not finish writing the ideas that they generated in strategic planning, while in speaking they could sufficiently tell a whole story. This seems to explain why extended online planning in speaking had some effect on written production, but that in writing had little effect on oral production. As shown in Table 3, extended online planning in speaking (S-W[+eop s]) had

positive effects on fluency (WPM) and accuracy (EFAS) in Writing 2 for Group 1. Group 1 had the sequence of writing-speaking (W-S) at Time 1, while the order at Time 2 was speaking-writing (S-W); and hence they had two oral tasks successively (W-S-S-W). The learners wrote part of ideas in Writing 1, and expressed more in Speaking 1. Being facilitated by Speaking 1, they expressed more ideas in Speaking 2, though they worked on a new topic. They developed ideas by making use of extended online planning in Speaking 2, and it helped them write more fluently and accurately in Writing 2. In other words, the opportunity of doing successive oral tasks was likely to help the learners have a broader picture of the narratives and hence enhanced their written performance. Extended online planning in speaking was effective for Group 1 at Time 2 but not for Group 2 at Time, and this result may suggest that the learners needed two opportunities of speaking before they had some beneficial effects. In contrast, Group 2, which resulted in no effects of extended online planning, had the S-W sequence at Time 1 and the W-S sequence at Time 2. They had two written tasks one after the other (S-W-W-S), and having two written tasks successively was not as effective as oral tasks. They wrote fewer ideas in writing than in speaking, and it seemed that limited ideas in writing did not promote speaking production.

Table 6 illustrates that the learners' production in speaking correlated with their production in writing; and this indicated that oral ability and written ability were related. Furthermore, it was found that the sequence of W-S-S-W was more effective than the S-W-W-S to enhance writing performance. These findings suggest that it would be more effective for L2 learners to do tasks in the sequence of speaking-writing than in the reverse order if the goal is to improve written performance. It is also important to suggest that not a single opportunity but multiple opportunities of extended online planning should be provided after strategic planning.

As Table 3 shows, the mean scores of accuracy (EFAS&TLU) in writing of Group 2 (S-W[+eop s]) at Time 1 were lower than Group 1 (W-S[-eop s]) in spite of the provision of extended online planning in speaking. At Time 2, Group 2 did the task in the condition of W-S[-eop s], and the mean scores of accuracy dropped (from 47.12 to 41.25 for EFAS; from 83.37 to 79.49 for TLU). On the other hand, the mean scores of Group 1 (S-W[+eop s]) increased at Time 2 with the positive effects of extended online planning in speaking; hence the difference between the two groups became greater at Time 2 and significant for EFAS. Although there was no significant difference across the 6 classes in accuracy ($F = 1.53$, $P = .122$ for EFAS; $\chi^2 = 14.54$, $P = .204$ for TLU), 3 classes in Group 2 could have

been less accurate in writing than the other 3 classes in Group 1. From these results, it might be more difficult for less accurate writers to do the written task without extended on-line planning in speaking; therefore the sequence of speaking and writing (S-W) would be more beneficial for these students than the writing and speaking order (W-S), especially when they do tasks under time pressure.

SUMMARY AND CONCLUSIONS

The first aim of this study was to examine the effects of sequencing order (speaking-writing vs. writing-speaking) and modality (speaking vs. writing) on L2 learners' oral and written narrative production. Sequence had little effect on oral performance, whereas it had some effect on fluency and accuracy of written performance. The second aim is to reveal the effects of modality. Modality had great effect on narrative performance. Oral production was more fluent than written production, but less complex and less accurate; and the two abilities were related with each other. These results indicated the following three major implications for task-based L2 learning and teaching.

The first implication is that the order of speaking-writing may be more effective than the reverse order for L2 learners in narrative task-based performance under time pressure. The sequencing order of speaking-writing was better than writing-speaking fluency and accuracy of Writing 2. When the same amount of time is provided, learners would have more ideas and broader pictures in speaking than in writing; and this would help learners write more fluently and accurately.

It is also important to consider of providing multiple opportunities of speaking-writing in task-based learning. The effects of speaking were obvious in writing at Time 2. Therefore, learners with limited oral proficiency like Japanese students in the present study would need several practices in the order of speaking-writing.

The final implication is that more time for writing after speaking should be provided. Modality differences were obvious. Speaking is faster but disfluent; they have more repetitions, self-corrections and false starts than writers. The slower process of writing creates more space for writers to attend to form compared to the speaking process. In addition, writers have a record of their language which they can read and edit, whereas speakers have an aural trace that immediately fades away. These differences between the two modalities lead to the differences in language production. In addition, writing is structurally and lexi-

cally more complex and more accurate than speaking. Since writing is slower than speaking, unpressured online planning in writing would benefit learners after having extended online planning in speaking.

There are several limitations of this study, which point to the need for further research. First, the learners may have had difficulty making use of extended online planning under time pressure, and hence the sequencing order did not have clear effects on their oral and written performance. Further research is needed to examine whether or not unpressured extended online planning will have effects on fluency, complexity, and accuracy of L2 learners' performance when tasks are provided in different sequencing orders.

Another limitation concerns methods of analysis. Most previous studies as well as the present study have used the general measures of fluency, complexity, and accuracy. These methods enable researchers to understand linguistic features of texts produced by learners. However, it would be necessary to investigate the effect of modality on L2 performance using specific measures. For example, examining cohesion, which is established through the lexical-syntactic channel (Biber, 1988), would identify some specific linguistic features in discourse levels. Cohesion would also be effective to examine modality difference.

In addition to measures for analysis, tasks need to be considered. This study used narrative tasks based on personal information; more complex and challenging tasks, however, would elicit specific aspects as well as general features of L2 language in task-based performance.

The present study investigated the effects of sequence and modality on the learners' narrative performance, but did not examine how the learners perceived modality and sequencing orders. Did they feel great differences between speaking and writing? Did they use strategic planning and extended online planning differently while doing the oral and written tasks in the different sequencing orders? Which order (speaking-writing vs. writing-speaking) did they prefer and why? Analyses of retrospective interviews about what learners actually did while planning (Ortega, 1995, 2005) would provide some answers to the questions mentioned above. Lack of information about what learners actually do while they plan is one of the limitations of the study of planning (Ellis, 2009). In addition to interviews and questionnaire, more direct methods of researching this problem are needed.

In conclusion, apart from the present study, no study has been conducted into the effect of the sequencing order of speaking and writing, although these two skills are often integrated in L2 classrooms. Further research on the sequencing order in relation to strategic

planning and online planning would help researchers and teachers understand more about planning in task-based learning and teaching.

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