

**Individual and Collaborative Planning Conditions:
Effects on Fluency, Complexity and Accuracy in L2
Argumentative Writing**

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Abstract

Research on pre-task planning has revealed that planned conditions have produced more fluent and complex language than unplanned conditions. To date, most of these studies have investigated the effects of individual planning on language production while collaborative planning has received scant attention. To determine the effects of pre-task planning on second language written production, the present study examined Iranian EFL learners' argumentative writings under the conditions of individual and collaborative pre-task planning. The participants' written productions were analyzed using three measures of fluency, complexity, and accuracy. The performance of individual planners and collaborative planners were compared using a series of one-way ANOVAs. Results indicated that collaborative planning promoted more accurate textual output while individual planning resulted in greater fluency, and neither type of planned conditions benefited complexity. Possible explanations are provided and the implications of the findings for the applicability of collaborative planning are discussed.

Keywords: individual and collaborative planning, pre-task planning, fluency, complexity, accuracy, argumentative writing

1. Introduction

In a review of writing research, Cumming (2001) notes that, over the past two decades, most L2 writing research has investigated three fundamental dimensions of L2 writing, namely, "(a) features of the texts that people

produce; (b) the composing processes that people use while they write; and (c) the sociocultural contexts in which people write” (p. 2). However, despite the large body of research into written texts, very few attempts had been made to link these three elements together into a coherent framework (Cumming, 1998). The present study is an attempt to composite all three dimensions.

The first category in Cumming’s (2001) tripartite distinction is examining second language (L2) writing improvement in terms of features of the texts. This study examined the three characteristics of L2 performance: complexity, fluency, and accuracy. The second dimension is investigating how L2 learners compose their written texts. Composing processes are organized into three broad stages of planning, formulating and revising (Flower & Hayes, 1981). Therefore, according to Cumming’s (2001), the present study falls within the second category, given its focus on pre-task planning. Following the third strand of recent L2 writing research (i.e., sociocultural perspective), this study sets out to investigate the effects of two individual and collaborative planned conditions on L2 written productions.

Moreover, two theoretical perspectives (cognitive and sociocultural) have greatly influenced the recent L2 writing research and pedagogy (Roca de Larios & Murphy, 2001). From a cognitive-based perspective, models of native language (L1) and L2 written production (e.g., Bereiter & Scardamalia, 1987; Flower, 1994; Hayes, 1996; Kellogg, 1996) have adopted a process approach. cognitive-based approach views writing as a recursive, cognitively demanding, problem solving task (Ortega, 2009). The sociocultural perspective, in contrast, does not understand writing as the formation of invisible processes which occurs inside one’s head, but rather an activity which forms a focus for individuals to seek cooperation and assistance from diverse people and resources (Cumming, 2001). This approach has led researchers to investigate students’ written productions concerning various contexts of L2 writing (e.g., Long, 1998; Parks, 2000; Riazi, 1997; Thatcher, 2000) and to examine peer interactions in the process of writing or revision of texts (e.g., Franken & Haslett, 2002; Kuiken & Vedder, 2002; Lockhart & Ng, 1995; Storch, 2005; Storch & Wigglesworth, 2007; Wigglesworth & Storch, 2009).

Zuengler and Miller’s (2006) challenged the incompatibility of these two theories (i.e., cognitive and sociocultural) arguing that they derived from differing views of learning. Efforts have been made to combine the two perspectives into one which is referred to as “sociocognitive” approach (Cheng, 2010; Flower, 1994; Kobayashi & Rinnert, 2008; Riazi, 1997; Roca de Larios & Murphy, 2001; Sasaki, 2009; Villamil & de Guerrero, 1996).

From a socio-cognitive perspective, writing is basically a mental activity within a certain socially mediated context. Riazi (1997) stated that the cognitive aspects of L2 writing are better explained when considered with the social situations (i.e., teachers, peers, and contexts) that the learners interact with.

Following this approach, the study presented here is framed within what Ortega and Carson (2010) call 'SLA-oriented L2 writing research'. As such, the present study is likely to explore associations between SLA research and L2 writing scholarship by investigating the issue of collaborative and individual pre-task planning in the domain of foreign language (FL) writing.

1.1 Planning in language production

With regard to research on planning, the issue of whether planning has effects on learners' task performances has been hotly debated in the contemporary task-based research literature (e.g., Ahmadian & Tavakoli, 2011; Ellis, 2009; Ellis & Yuan, 2004; Ojima, 2006; Skehan, 2009; Tuan & Storch, 2007; Wigglesworth & Elder, 2010). A large number of studies have investigated the effects of planning on L2 learners' performance of oral narratives (e.g., Ellis, 2009; Foster & Skehan, 1996; Gilabert, 2007; Ortega, 1999; Robinson, 1995; Sangarun, 2005; Schleppegrell & Colombi, 1997; Skehan & Foster, 1997, 1999; Tajima, 2003; Tuan & Storch, 2007; Wendel, 1997; Yuan & Ellis, 2003). These studies showed that giving learners the opportunity to plan a narrative before they speak it (i.e., pre-task planning) resulted in significant gains in both fluency (whether measured in terms of temporal variables such as number of syllables per minute or hesitation variables such as frequency of reformulations) and complexity (measured most commonly in terms of the degree of subordination). However, these studies produced mixed results when the focus was accuracy, as measured, for example, by the percentage of error-free clauses.

Although Ellis (1987) found that pre-task planning led to increased accuracy in the use of regular past-tense verbs in oral narratives in English, Wendel (1997) found no effect on accuracy in Japanese learners' narrative productions. Other studies have also produced mixed results where accuracy is concerned. For example, Ortega (1999) found that pre-task planning led to greater accuracy in the use of noun modifiers in L2 Spanish but not in the use of articles. Recently, Ellis (2009) has reviewed 19 studies that investigated the effects of three types of planning (rehearsal, pre-task planning, and within-task planning) on the fluency, complexity, and accuracy of L2 performance. All three types of planning have been shown to have beneficial effects on fluency but the results for complexity and

accuracy were more mixed, reflecting both the type of planning and also the mediating role of various factors, including task design and implementation variables and individual difference factors. Overall, these studies demonstrated that pre-task planning aids fluency and complexity but not necessarily accuracy in L2 learners' oral narratives.

Manchón and Roca de Larios (2007) stated "we do not have a well-established body of literature (in L2 writing research) that unequivocally shows *who* benefits from *what* type of planning and *when*" (p. 556). In contrast to the large number of studies examining the effects of planning on oral performance, there have been few empirical studies that have investigated the effects of planning on written performance (e.g., Dellerman, Coirier, & Marchand, 1996; Ellis & Yuan, 2004). These two studies documented above (Dellerman et al., 1996; Ellis & Yuan, 2004) have supported that presence of planned conditions results in improved written performance. These results are in line with earlier investigations of the effects of planning on L2 oral performance.

1.2 Collaboration in language production

It is worth noting that there is a great deal of variables which might influence the usage of planning time. For instance, Ortega (1999) investigated what exactly students do and how they allocate limited attentional resources during the planning time. Another variable which requires more investigations is the type of planning. Numerous studies so far have focused upon individual planning, that is to say, learners were given time to plan but planning was performed in isolation.

Most existing research on pair and group work in L2 writing has explored the benefits of collaborative writing (e.g., Kuiken & Vedder, 2002; Shehadeh, 2011; Storch, 2005; Storch & Wigglesworth, 2007; Wigglesworth & Storch, 2009), Or group/peer feedback (e.g., Min, 2006; Paulus, 1999; Rollinson, 2005; Yang, Badger, & Yu, 2006; Zhang, 1995; Zhu, 2001) rather than collaborative planning in L2 writing. However, there are very few studies that have compared collaborative and individual planning in L2 oral production (Foster & Skehan, 1999; Tuan & Storch, 2007). In what follows, we review several related studies on collaborative writing (collaborative composing) following with two studies on collaborative planning in L2 oral performance. This will lead us into the area of planning collaboration, the strand of research within which, this empirical study to be reported later is more specifically grounded.

In another study, Storch (2005) examined the effectiveness of collaborative pair work when students produced a written text either in pairs or individually. The results showed that students who produced written

language collaboratively wrote shorter but grammatically more accurate and more complex texts in comparison to those who produced them individually. Along the same line of research, Wigglesworth and Storch (2009) compared argumentative compositions produced by pairs and individuals to identify whether there were any differences in terms of the accuracy, fluency or complexity of the scripts produced. Results revealed that collaboration affected accuracy positively, but did not affect fluency and complexity.

More recently, Shehadeh (2011) examined the effects and learners' perceptions of collaborative writing in a FL context. Writing tasks were carried out by students individually and in pairs during sixteen weeks then analyzed in terms of a holistic rating procedure. Findings revealed that collaboration had positive effects on content, organization, and vocabulary, but not on grammar and mechanics. Besides, most students were quite supportive of the activity and found the experience enjoyable useful in multiple ways.

As reviewed above, most existing research on collaborative writing has shown the positive influence of pair work on L2 writing. So far, due to lack of research on collaborative planning in L2 writing, we have reviewed collaborative writing scholarship which focuses on composing collaboration rather than planning collaboration. In the following paragraphs, we review two studies investigating the benefits of collaborative planning in L2 oral production.

Considering individual and collaborative planning in L2 oral performance, Foster and Skehan (1999) examined the effects of four planning conditions (teacher-led, solitary, group, and no planning) on a narrative retelling task. They found that the teacher-fronted condition showed a positive impact on accuracy, while the solitary planning condition had greater influence on complexity, fluency and turn length. Group-based planning did not lead to performance that was significantly different from those following no planning.

In a later study, Tuan and Storch (2007) investigated the nature and impact of group planning on learners' subsequent individual oral presentations. The study found that group planning dealt with the content rather than the language of presentations. Using a matching procedure, the study found that most of the ideas presented were generated during the planning time. However, there were variations between the groups. The group that seemed to be the most interactive and that focused on both content and language was a group composed of mixed proficiency learners. Tuan and Storch concluded that group planning assisted most learners in their subsequent presentations.

It seems that only two studies (i.e., Tuan & Storch, 2007; Foster & Skehan, 1999) have investigated the effects of planning (considering group and solitary as different sources of planning) on L2 performance. Since these two studies investigated learners' oral production not their written output, the role that individual and collaborative planning plays in the production of written text has remained unclear. It was, therefore, deemed essential to further explore this fact and collect additional evidence about individual and group planning in L2 written production. As such, the current study may contribute to SLA research beyond oral data to data from written sources. Consequently, in an attempt to fill in these gaps in the existing literature, the current research sought to examine the influence of planning collaboration on students' L2 writings in an EFL context.

2. Present Study

The study reported in this paper sets out to investigate the effects of individual and collaborative planned conditions on the fluency, complexity, and accuracy of Iranian EFL learners' production in a written argumentative task. The study was conducted in a natural classroom context, considering the demand of writing tasks and the crucial role of pair work in this experiment. Based on the problem and purpose discussed above, the following research questions were addressed:

1. Do individual or collaborative planned conditions have any effects on the *fluency* of Iranian EFL learners' production in a written argumentative task?
2. Do individual or collaborative planned conditions have any effects on the *complexity* of Iranian EFL learners' production in a written argumentative task?
3. Do individual or collaborative planned conditions have any effects on the *accuracy* of Iranian EFL learners' production in a written argumentative task?

3. Method

3.1 Participants

Ninety four fulltime undergraduate English translation majors enrolled in EFL writing courses at two private universities in Isfahan, Iran, took part in the study voluntarily. The study was conducted in two classrooms, both taught by the same teacher. Participants were both male and female sophomore students, and their ages ranged from 19 to 28. Based on a version of an Oxford Placement Test, 94 intermediate-level learners were selected out of the total 120 students of the two classes. The test consisted of grammar (20 items), vocabulary (20 items), reading comprehension (20 items) together with the

writing section. The allotted time for answering the questions was 45 minutes. After correcting the papers, 94 students were selected as the intermediate group based on the OPT manual. Afterwards, using tables of random numbers, participants were randomly assigned to two groups, individual planned condition (N = 36) and collaborative planned condition (N = 58). Data-gathering began 5 weeks after the start of the term to allow the participants to stabilize. All data were collected during normally scheduled class times by course instructor.

3.2 Procedure

3.2.1 Task

Participants were asked to write an argumentative essay giving their opinions concerning the pernicious influence of examinations on education. A written argumentative task was chosen to allow comparison with other studies that have investigated the effects of planning on similar task (e.g., Dellerman et al., 1996; Franken & Haslett, 2002; Wigglesworth & Storch, 2009). The argumentative task was reasonably demanding on the participants and could exploit their linguistic resources fully. When doing the argumentative task the participants had to transform the knowledge in order to come up with main and supportive reasons to back-up their positions. Hence, this task was hypothesized to require high levels of attention on the part of the participants, with progressively less familiar and less predictable information causing an increasingly taxing cognitive load and, as a consequence, influencing performance on the task.

3.2.2 Task conditions

In this study, task condition is operationalized by two types of planned conditions (Individual Planned Condition and Collaborative Planned Condition) in normal classroom setting.

In the individual planned condition, participants (N = 36) were required to fill out a task sheet (adopted from: Kayferz & Stice, 1987, p. 91) to ensure that they are mentally engaged in planning. The form was designed with a basic structure in the task sheet: an introduction part, a body with supporting ideas, and a conclusion part (see appendix). Then, they were asked to write an essay as they had already planned.

In the collaborative planned condition, participants (N = 58) were asked to fill out the same task sheet used in individual planned condition and told to interact with a peer about how to approach a given topic or what to write. The participants selected their own partners because it has been posited that the learners feel more motivated and inclined to talk with their self-selected peers (Franken & Haslett, 2002). Afterwards, participants were asked to independently write an essay in English based on what they had

planned with their partner. In both planning conditions learners kept their planning notes for when they started writing.

The participants were given 10 minutes for planning in each of the two planned conditions. The planning time was determined based on previous studies (e.g., Crookes, 1989; Ellis & Yuan, 2004; Kellogg, 1988, 1990; Mehnert, 1998; Ojima, 2006; Skehan & Foster, 1997; Yuan & Ellis, 2003), suggesting that a minimum of 10 minutes of planning is required in order to obtain measurable effects on different aspects of language use. After 10 minutes of planning, students had 30 minutes to complete the writing task. In this way, the participants were under pressure to perform a task within a specified time limit. The time limits for completion of an assigned task were based on the conditions that previous studies all followed (e.g. Dellerman et al., 1996).

3.3 Measures

Essays were coded for a range of dependent variables. Measures of fluency, complexity, and accuracy were employed to evaluate the quality of the participants' written production. This procedure is important to the extent that Lu (2011) asserts, "needless to say, a full picture of language development in L2 writing can only be obtained by engaging fluency, accuracy, and complexity measures at various linguistic levels" (p. 38). These measures were largely the same as those used in other studies (i.e. in Ellis & Yuan, 2004; Foster & Skehan, 1996; Storch, 2005; Wigglesworth & Storch, 2009). In order to undertake this analysis, all written work was coded in the first instance for T-units and clauses. A T-unit is defined by Hunt (1966, p. 735) as "one main clause plus whatever subordinate clauses happen to be attached to or embedded within it" (p. 735). In order to measure complexity and accuracy, the compositions had to be analyzed for clauses, distinguishing between independent and dependent clauses. In this study, a dependent clause was one which contained a finite or a non-finite verb and at least one additional clause element of the following: subject, object, complement or adverbial.

Fluency: As (Skehan, 2003, 2009) and Tavakoli and Skehan (2005) suggested, fluency can be categorized into three sub-dimensions in oral productions, namely, breakdown, speed, and repair fluency. One can also use higher order measures such as length-of-run, which indicates the degree of automatization in language performance (Skehan, 2009). However, fluency measures were commonly used for oral production; and to make them appropriate to written production some changes are needed. Considering the multifaceted nature of fluency, L2 writing researchers have used various measures to examine fluency: syllables per minute, number of

dysfluencies (Ellis & Yuan, 2004), mean number of words per minute (Ong & Zhang, 2011), average number of words per T-unit (Larsen-Freeman, 2006; Storch & Wigglesworth, 2007), number of words, T-units and clauses per text (Storch & Wigglesworth, 2007; Wigglesworth & Storch, 2009). In the present research, following Wigglesworth and Storch, fluency was measured in terms of the average number of words, T-units and clauses per text.

Complexity: various measures have been employed to operationalize the construct of syntactic complexity in both oral and written data. In their review of previous studies, Norris and Ortega (2009) identify three measureable sub-constructs in syntactic complexity: (i) complexity via subordination, (ii) overall or general complexity, and (iii) subclausal complexity via phrasal elaboration. According to Norris and Ortega (2009) coordination can show complexity at beginning levels, subordination is a powerful index of complexification at intermediate and upper-intermediate levels, and sub-clausal or phrasal index ought to have a much great predictive power when measuring syntactic complexity at advanced levels of L2 development.

Since the participants of this study are intermediate-level learners, subordination measures are expected to be the most indicative source of syntactic complexity. In the current study, therefore, complexity was measured through proportion of clauses to T-units, which according to Foster and Skehan (1996) is a reliable measure of subordination, correlating well with other measures of complexity. Moreover, the T-unit can be ideal for intermediate or advanced written data which are usually formed in full clauses and sentences (Norris & Ortega, 2009). Another measure of complexity used in this study is the proportion of dependent clauses to clauses (DC/C), which examines the degree of embedding in the text (Wolfe-Quintero, Inagaki, & Kim, 1998, as cited in Wigglesworth & Storch, 2009).

However, there is some disagreement among researchers as to how examine complexity in L2 writing. Recently, Biber, Gray, and Poonpon (2011) and Lu (2011) argue for the need to reconceptualize complexity in L2 writing. Biber, et, al's (2011) corpus study showed that most clausal subordination measures are more common in spoken discourse than writing, and that the latter is more complex at the phrase level than the former is. In another study, Lu (2011) examined 14 syntactic complexity measures in a corpus-based evaluation. He discovered that phrasal complexity within clauses became more noticeable as writers progressed in their undergraduate study. Consequently, both studies suggested that complexity at the phrasal level deserves closer attention in future research. In addition, these studies

provide several pieces of evidence in support of the clause as a potentially more informative unit of analysis than the T-unit.

Accuracy: There is greater agreement among researchers with measures of accuracy (Tavakoli & Skehan, 2005). In this study, two general measures of accuracy were used: the proportion of error-free T-units to all T-units (EFT/T) and the proportion of error-free clauses of all clauses (EFC/C); both proportions were expressed as percentages (Wigglesworth & Storch, 2009). Errors in this study included syntactical errors (e.g., errors in word order, missing elements) and morphology (e.g., verb tense, subject-verb agreement, errors in use of articles and prepositions, errors in word forms). Errors in lexis (word choice) were included only when the word used obscured meaning. All errors in spelling and punctuation were ignored. In summary, the quantitative measures shown in Table 1 were used to analyze the writings produced by the participants.

Table 1. Measures used in analysis of written productions

Fluency	Complexity	Accuracy
average number of words per text	proportion of clauses to T-units	percentage of error-free T-units
average number of T-units per text	percentage of dependent clauses to all clauses	percentage of error-free clauses
average number of clauses per text		

3.4 Data Analysis

A series of one-way ANOVAs were performed on all the measures and the alpha for achieving statistical significance was set at .05. Outliers were detected by means of box plots and eliminated from the calculation in order to achieve the sphericity of the data, which was confirmed by means of Mauchly's test. Inter-rater reliability coefficients were obtained on all categories identified for analysis by two raters working independently. The analysis of the written texts was carried out by the researcher and a research assistant. Inter-rater reliability was above .88 on all measures.

It was felt important to examine the dependent variables in separate ANOVAs, rather than through a more general multivariate ANOVA. The rationale for the dependent variables presented earlier indicates the distinct role that each contributes. This claim is supported by a factor analytic study of a pooled data set from the present data set and previous researches (e.g., Foster & Skehan, 1996; Skehan & Foster, 1997). This analysis generated a three-factor solution, with the three orthogonal factors clearly identifiable as fluency, complexity, and accuracy, suggesting adequate independence among them. Moreover, examining the effects of the treatments by one-way

ANOVAs minimizes the risk of a Type 1 error (Yuan & Ellis, 2003). Further, Keselman et al. (1998) argue that there is very limited empirical support for a MANOVA- univariate data analysis strategy.

Additionally, Cohen’s *d* values (effect sizes) were calculated in order to investigate the size of the differences between the two individual and collaborative planned conditions. Following Cohen (1988), a *d* value around 0.80 is large, around 0.50 is medium, and around or above 0.20 is small.

4. Results

As indicated earlier, three aspects of language use were examined to see how the participants in two planned conditions (Individual and Collaborative) performed the written task. The results of one-way ANOVAs will be reported separately comparing the results on the measures for fluency, complexity and accuracy for pair and individual groups.

4.1 Fluency

As shown in Table 2, students in the collaborative planning condition tended to compose shorter texts than students who planned individually. Considering the first measure of fluency (i.e. words per text), the average length of the text composed by collaborative planners was 155.76 words (S.D = 34.5) whereas by individual planners 169.44 words (S.D = 25.5). Similarly, with regard to other two measures of fluency (i.e. T-units per text and clauses per texts) solitary planning led to higher means. The results of the one-way ANOVA shown in Table 2 revealed that the difference in the groups is statistically significant (words per text: $F = 4.216, df 1, 94, p = 0.043, d = 0.45$; T-units per text $F = 8.180, df 1, 94, p = 0.005, d = 0.60$; clauses per texts $F = 10.644, df 1, 94, p = 0.002, d = 0.69$). Consequently, all measures of fluency are higher in the individual planned condition indicating that in terms of fluency (i.e., length of production), individual planning resulted in longer texts.

Table 2. Measures of fluency

		N	Sum	Mean	Std. Deviation	F	Sig.	Effect Size
Average words per text	Individual	36	6100	169.44	25.562			
	Collaborative	58	9034	155.76	34.521	4.216	.043	0.450
	Total	94	15134	161.00	31.954			
Average T-units per text	Individual	36	478	13.28	2.212			
	Collaborative	58	690	11.90	2.315	8.180	.005	0.609
	Total	94	1168	12.43	2.362			

Average clauses per text	Individual	36	922	25.61	4.291			
	Collaborative	58	1304	22.48	4.654	10.644	.002	0.699
	Total	94	2226	23.68	4.748			

4.2 Complexity

In terms of complexity, a similar tendency was observed in collaborative and individual planned conditions. None of the two complexity measures for either of the planning conditions showed any significant differences (ratio of clauses to T-units: $F = 0.784$, df 1, 94, $p = 0.378$, $d = 0.18$; percentage of dependent clauses: $F = 0.199$, df 1, 94, $p = 0.657$, $d = 0.09$). As shown in table 3, no significant differences were found in the way in which the individuals performed the tasks compared to the pairs. However, as stated in Wigglesworth and Storch (2009), the two measures used here reflect the same construct and there is the possibility that other measures of complexity such as the Mean Segmental Type/Token Ratio (Malvern & Richards, 2002) or other measures of grammatical verb form such as modality, tense or voice (Ellis & Yuan, 2004) might elicit different results.

Table 3. Measures of complexity

		N	Mean	Std. Deviation	F	Sig.	Effect Size (Cohen's d)
Clauses per T-unit	Individual	36	1.9566	.33796			
	Collaborative	58	1.9032	.24472	.784	.378	0.180
	Total	94	1.9237	.28349			
Dependent clauses percentage	Individual	36	41.6645	8.51151			
	Collaborative	58	40.8966	7.86024	.199	.657	0.093
	Total	94	41.1907	8.07915			

4.3 Accuracy

Accuracy was measured in global units: error free T-units and error free clauses. The relevant results are shown in Table 4. The learners in collaborative planned condition had the highest mean on both measures. The ANOVA showed that there were overall statistically significant differences for both the percentage of error free T-units and the percentage of error free clauses indicating that collaborative planned condition had a positive effect on accuracy. There were significant differences between the two groups on all dependent variables of accuracy, with the collaborative planners producing more accurate error-free T-units percentage ($F = 91.655$, df 1,94,

$p < .0001$, $d = 2.01$) and more error free clauses percentage ($F = 70.92$, df 1,94, $p < .0001$, $d = 1.67$). In addition, a similar trend was obtained with error free T-units and error free clauses not stated as percentages. ANOVA showed the differences to be statistically significant in the case of these two variables (error free T-units: $F = 32.66$, df 1, 94, $p < .0001$, $d = 1.5$; error free clauses: $F = 5.938$, df 1, 94, $p = 0.017$, $d = 0.44$). In addition, the first three accuracy measures generated effect sizes which are large (judged through Cohen's d). Overall, these results for accuracy indicate that collaborative planning resulted in more accurate performance than individual planning.

Table 4. Measures of accuracy

		N	Sum	Mean	Std. Deviation	F	Sig.	Effect Size (Cohen's d)
Error free T-units	Individual	36	180	5	2	32.660	.000	1.5
	Collaborative	58	454	8	2			
	Total	94	634	7	3			
Error free T-units percentage	Individual	36		36.99	14.64	91.655	.000	2.012
	Collaborative	58		65.35	13.52			
	Total	94		54.49	19.62			
Error free clauses	Individual	36	574	16	4	5.938	.017	0.441
	Collaborative	58	1062	18	5			
	Total	94	1636	17	5			
Error free clauses percentage	Individual	36		61.59	14.25	70.920	.000	1.672
	Collaborative	58		80.90	7.98			
	Total	94		73.51	14.30			

5. Discussion

The purpose of this study was to investigate how certain aspects of learners' written performance are affected in different planned conditions and to use the results of the analyses to improve learners' L2 writing process in the classroom context. In what follows, the findings obtained regarding each research question will be discussed in turn.

The first research question addressed the effects of planned conditions on the fluency of learners' production in the written argumentative task. Fluency was measured with regard to average number of words, T units, and clauses per text. Results suggest that fluency (i.e. length of production) is

significantly advantaged by individual planning. This finding is comparable to the results obtained in studies of oral language production. With regard to fluency, the findings of this study confirmed the results reported by Foster and Skehan (1999) who employed average number of pauses to measure fluency. Foster and Skehan (1999) found that group-based planning proved to be a relatively unsuccessful condition and provoked less fluency than solitary planning.

Moreover, if we consider collaborative planning as a kind of interaction prior to producing the text, then our finding about fluency runs counter to a claim made by Swain and Lapkin (1995) about the output hypothesis stating that interaction enhances fluency.

There is one possible explanation as to why collaborative planning does not result in longer texts. Collaborative planning can provide opportunities for students to conceptualize a variety of other people's viewpoints which perhaps assist them to write in a more summary fashion. However, individual planning may limit the learners to their own ideas with no help to conceptualize or direct ideas and as a result, make them to write more detailed and lengthy compositions (Shi, 1998).

The second research question concerned the effects of planned conditions on the complexity of learners' writings. This study does not replicate a reliable effect for the complexity of written essays as shown in other studies. The results for complexity measures (ratio of clauses to T-units and percentage of dependent clauses) failed to show a significant effect in either planned conditions. With regard to individual and collaborative planning, this finding seems to contradict the results of Foster and Skehan's (1999) study, in which individual planners produce more complex language than group planners.

With respect to pre-task planning in general, our findings about complexity are contrary to those obtained in both written and oral language production research on solitary pre-task planning (Ellis & Yuan, 2004; Foster & Skehan, 1996; Ortega, 1999; Sangarun, 2005; Skehan & Foster, 1997; Yuan & Ellis, 2003), almost all of which found that pre-task planning resulted in greater complexity in comparison to no planning condition. However there is plenty of evidence that pre-task planning promotes more complex language (Ellis, 2009), our results support other studies (Elder & Iwashita, 2005; Gilabert, 2007; Mehnert, 1998; Tajima, 2003; Wigglesworth & Elder, 2010) which found no effect for solitary pre-task planning on complexity.

This contrast in findings with oral studies may be due to the nature of the measures used. Recently, some scholars (Biber et al., 2011; Lu, 2011; Norris & Ortega, 2009; Ravid & Berman, 2010; Rimmer, 2006) have

challenged the application of subordination-based measures in L2 writing studies. Biber et al. (2011) argued that most clausal subordination measures are actually more common in conversation than writing. Based on their challenge complexity measures used in this study miss out an important kind of complexity in writing i.e. non-clausal features embedded in noun phrases. This suggests a need for more investigations exploring complex phrase constituents rather than clause constituents.

Another possible explanation concerning the lack of significance in complexity is the task-type of argumentation which might necessitate a certain amount of subordination. As a result, planning conditions might have little effect on complexity.

The third research question addressed the effects of planned conditions on the accuracy of learners' written production. The findings on accuracy are fairly consistent and clear. Results revealed that learners in the collaborative planned condition noticeably outperformed learners in the individual planned condition in all the measures of accuracy in the argumentative writing task. This finding is consistent with the results of some previous SLA studies that have shown that collaboration may improve task performance in terms of the accurate productions (Lapkin & Swain, 2000; Lapkin, Swain, & Smith, 2002; Nassaji & Tian, 2010; Swain, 1998).

This finding supports some scholars' statements related to output hypothesis (e.g., Pica, 1988; Swain, 1995, 1998; Swain & Lapkin, 1995). They claimed that interaction can lead to improved grammatical performance. This finding that collaborative planning leads to more accurate L2 written production can lend support to Swain's (1998) claim that learners' meta-talk occurring during the collaborative dialogues can serve as a consciousness-raising device which leads to focus on form and therefore improvements in accuracy.

Moreover, Swain (1995) proposed a Vygotskian perspective on language learning i.e. social constructivist view of learning. In her discussion about functions of output she stated that "according to Vygotsky, cognitive processes arise from the interaction that occurs between individuals. That is, cognitive development, including presumably language development, originates from inter psychological plane" (Swain, 1995, p. 135). With respect to the social constructivist view of learning, students collaboratively construct knowledge when working together on the pre-task sheet (see appendix). Collaborative planning provides learners with chances for meaningful communication and involves them in cognitive processes which can be a source for L2 learning (Swain, 1995, 2010). In other words, another advantage of collaboration in addition to producing more accurate writings is that it may lead to subsequent learning of L2 forms. However, the

beneficial effects of collaborative pre-task planning for L2 learning await further research findings.

The results of this study regarding complexity and accuracy are not consistent with the previous research result done by Tuan and Storch (2007) on oral production. From the discussion of the results of their study, they concluded that, group planners focused their attention on content rather than on the language of their subsequent oral presentations; conversely, our findings showed that learners valued accuracy more than complexity in their writings. Learners' focus on content has also been reported in other studies as solitary planners. For example, Wendel (1997), who examined planners' notes collected after unguided strategic individual planning, also reported that planners either outlined the story they were about to tell, or jotted down words or phrases. That is to say, they used planning time to organize what they were going to say and only then how to say it in their performance. In this study, whatever was happening in the collaborative and individual planning did not affect the complexity of the learners' compositions. Overall, these differences warrant additional research to investigate what actually happens during planning time, whether individual or collaborative.

Moreover, the pattern obtained from our results provides further evidence in support of trade-off effects between complexity and accuracy. The theoretical rationale originates in the information processing hypothesis which claims that learners' attentional capacity is limited and selective. Therefore, paying attention to one area of language (e.g. accuracy) may reduce attention to other dimensions of performance (e.g. complexity) (Foster & Skehan, 1996; Skehan, 2009; Skehan & Foster, 1999). What seems to be happening here is that subjects were operating under some information-processing pressure after planning that they had to allocate attention to accuracy at the expense of other goals such as complexity and probably fluency (for collaborative planners).

Another possible interpretation of the results might lie in the point that, from a socio-cognitive perspective, "the effects of planning on attention are as much a matter of social action as they are of cognitive processing" (Batstone, 2005, p. 278). Batstone (2005) claimed that: "we can usefully think of learners' engagements with language through planning as being *socio-cognitive*: 'cognitive' because attention is so centrally implicated, 'social' because attention is activated through discourse endeavor of very particular kinds, 'socio-cognitive' because the cognitive and the social are so closely intertwined" (p. 278). This may indicate that when learners plan together (a social action) their attention is activated through discourse endeavor which as a result limit their attention to complexity.

A further explanation for limited attention to complexity might be related to task type. Students may experience additional cognitive load when producing argumentative writings due to its high content interactivity. The notion of content interactivity refers to the degree to which information is interrelated or discrete (Sweller, 1994). A writing task type like narrative is discrete and has low interactivity; therefore, this task type has little impact on processing capacity. On the other hand, “content needed for argument has a high degree of interactivity particularly when generated not only from textual resources, but also with a partner’ (Franken & Haslett, 2002, p. 224). Consequently, producing argumentative compositions in this study may impose additional cognitive loads which cause attentional shift to focus on other aspects of writing like accuracy.

6. Conclusion

The aim of this study was to investigate the effects of two different planned conditions (individual and collaborative) on the three aspects of learners’ written performance. Findings indicate that the collaborative planned condition promoted more accurate textual output while individual planned condition resulted in greater fluency and neither type of planned conditions benefited complexity.

The main theoretical implication of this study is that it adds to the literature by extending the social constructivist theory of learning from speaking to writing. From a socio-cognitive perspective, this study might add to the knowledge of cognitive processes in relation to a certain socially mediated context (i.e. planning with a peer). However, due to the paucity of research on written language production from a socio-cognitive perspective, the findings of this study open up a whole range of possibilities for future research.

The results of this study have some pedagogical implications. First, the beneficial effect of collaborative planning on L2 writing accuracy found in our study provide further empirical evidence of the usefulness of pair work in the L2 writing classroom. Student collaboration can form a positive social atmosphere in the FL classroom.

Second, the discussion of the results of this study needs to be approached from process-oriented theory in L2 writing, in particular, with regard to the impact of planning as a major part of writing process. As Dellerman et al. (1996) and Ellis and Yuan (2004) indicate, the use of planning activity can be an effective pedagogical tool for language learners to foster their writing skills. Accordingly, it may be beneficial for instructors to promote a variety of planning activities in L2 composition classes. Teachers could train learners how to utilize planning strategies in

composition classes by utilizing different types of hands-on planning activities, for example, planning with a peer, brainstorming in a group, or a task sheet to help them organize information according to instructional goals or the nature of writing tasks. Also, it would be interesting to examine planning conditions when students are asked to pay attention to linguistic forms (e.g. list some syntactic structures or vocabulary they might use).

In addition, results of the study suggest that, with the same time for composition and planning, students produced longer texts (more fluent) after individual planning; however, these written texts were not better with respect to accuracy. This may imply that writing after individual planning might have enabled learners to generate longer texts which need to be revised later for better quality essays. Therefore teachers may have to give individual planners an extra time for revising the text after the completion of the task.

Moreover, planning is expected to ease cognitive processing load and to facilitate to recall all the relevant background knowledge. From the task-based approach to L2 writing, the results of the study suggest that by engaging in such a pre-task activity as planning, learners can pay more attention to how they are going to carry out the task. In the present study, planners were asked to complete pre-task sheets (see appendix) prior to the main writing tasks which help them to plan how they are going to carry out the task. However, instructors should take into consideration how to sequence the tasks selected for an instruction, and how to implement the tasks to increase learners' writing ability in a timely manner in order to meet the criteria of the task-based approach in the real classroom context. In that sense, this study can be expected to play a part in the framework of pre-task influence in L2 writing tasks unlike the recent research trend that focused on processing influence on oral tasks.

Despite the positive findings of this study with regard to planning in L2 writing, some limitations need to be acknowledged and be considered in future research. First, as mentioned earlier, the task type of argumentation could have some effects on our findings and therefore, the results might not be generalizable in studies with other types of text. As such, more research needs to be conducted that assigns tasks comparable to those used in this and previous studies in order to further verify the interaction effects between pre-task planning conditions and the levels of cognitive and linguistic demands of tasks.

The second limitation of the study is the operationalization of the measures of fluency and complexity. Fluency was measured as words, clauses, and T-units per text; therefore, no strong claims can be made based on this small set of measures of L2 performance. In addition, as mentioned

earlier, complexity measures used in this study have been challenged by some scholars (Biber et al., 2011; Lu, 2011). Consequently, complementary measures such as noun-phrase complexity and lexical variety in line with recent conceptualizations of complexity should be included in future research as these might shed a better light on how collaborative planning affects writing quality. Moreover, further investigation seems necessary since this study found no significant differences in the complexity of students' compositions under either of planning conditions.

Third, the interaction in which learners were engaged in the planning stage was not audio-taped, transcribed, or analyzed. The reason for this practical limitation was that the study was conducted on a large scale. Future research needs to focus more on how students plan their writings collaboratively and what they especially do during the planning time. For example, as Cumming (1998) suggested that first language (L1) has an important effect on L2 writing; further research may try to find out whether L2 learner benefit from a pre-task collaborative planning in their first language (L1) before they write in L2.

Fourth, learners chose a partner that they prefer, which might have influenced their written performance. Therefore, care needs to be taken for future research in the way in which learners are formed into groups for collaborative work (Franken & Haslett, 2002). Additionally, as noted by Tuan and Storch (2007) "groups composed of mixed proficiency learners appeared to be the most beneficial to language learning and learners' subsequent task performance" (p. 122). This is related to the concept of scaffolding which describes the role of a more capable peer in assisting the other to solve problems in the zone of proximal development as described by Vygotsky (Vygotsky, 1978, p. 86). Although this factor was not explored in the present study, future research is suggested to address the potential positive effects of groups composed of mixed proficiency learners.

Contrary to the limitations noted above, it can be asserted that the findings of the present study can probably be generalizable to other EFL contexts. Findings of this study related to the effects of collaborative planning and individual planning on accuracy and fluency of written performance are confirmed to be statistically significant with plausible p-value (see the results section above). This would indicate that if collaborative planning and individual planning turned up to benefit the students in our classroom in Iranian EFL context, the application of such variables to other EFL contexts or classes can be beneficial. This fact is dependable enough to provide empirical evidence in support of the previous studies discussed earlier. But in terms of the effects of collaborative planning and individual planning on complexity, the findings did not prove

useful as to make generalizations to other population. That is, in this respect, the obtained findings are silent, and more studies need to be conducted so as to cast light on the results of the previous investigations and to make generalizations more possible. In the long run, this lack of generalizations regarding the effect on complexity should not be interpreted negatively, but rather it is regarded a positive point since it may generate many other questions and thus the line of research in this respect is open.

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