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Is Complexity Reachable Through Planning Conditions in Written Task Performance?

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Abstract

The present study investigated the effects of two types of planning namely unguided pre-task planning (UPP) and content-focused strategic planning (CSP) on EFL learners' written task production in terms of syntactic complexity and lexical variety. One hundred and two Iranian English language students produced narratives for an episode of Mr. Bean's TV show. The results of the study revealed that both groups outperformed no-planning group; however, significance differences were not achieved for any of them. The findings of this study demonstrated that planning with or without instructions do not prompt complexity and other factors are also needed to be taken into consideration.

Keywords: Unguided pre-task planning, strategic planning, syntactic complexity, lexical variety, narrative task

1. Introduction

Most of the earlier studies on the effect of planning conditions on complexity are unanimous on the belief that planning demonstrates positive influences on complexity of task performance (Crookes, 1989; Foster & Skehan, 1996; Skehan & Foster, 1997; Ortega, 1999; Yuan & Ellis, 2003). On the other hand, some believe that there is a trade-off between accuracy and complexity (Skehan & Foster, 1997). However, there is a need for more investigation in interpreting the differential effects of planning on complexity measures especially in writing. Hence, though planning shows positive effects on complexity measures, yet to what extent these effects are significant, the design of the task, type of planning, and the ways for measuring complexity put the issue into question.

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The present study was set out to unveil the effect of unguided pre-task planning (UPP) and content-focused strategic planning (CSP) on the measures of syntactic complexity and lexical variety as the two main indices of complexity in a narrative written task production.

1.1. Measuring complexity

“When we measure fluency, we are measuring the observable outcome of automaticity of access, and when we measure accuracy or complexity, we are measuring the observable outcome of representation and restructuring (Wolfe-Quintero, Inagaki, & Kim, 1998, p. 5). SLA researchers have employed different methods for measuring language development; yet, these three aspects of production have been widely used in many studies to measure learners’ language development (Ellis, 1987; Crookes; 1989; Wendel, 1997; Skehan & Foster, 1999; Ortega, 1999; Ellis & Yuan, 2004). According to (Naves, 2006), the primary premises of employing complexity, accuracy, and fluency (CAF) indices lie in the fact that as learners develop and become more proficient, they write and speak more accurately, fluently and with more complexity.

As other aspects of production, complexity has been rated by global and specific measures within the literature. (Crookes, 1989) used the specific scale of (subordinate clauses) to measure complexity. Conversely, (Mehnert, 1998) used global measures for evaluating complexity. He assessed complexity by three measures of length of c-unit, number of s-nodes per t-unit, and the number of subordinate clauses per t-unit. A t-unit can be syntactically simple or complex. It is a measure for linguistic complexity of sentences; the shortest unit which a sentence can be reduced to and consisting of one independent clause together with whatever dependant clauses that are attached to it. Some researchers such as (Foster & Skehan, 1996) used c-units for measuring syntactic complexity, which focuses on meaning. They defined c-unit as "an utterance providing referential or pragmatic meaning, consisting of either a simple clause, or an independent sub clause or unit, together with subordinate clause(s) associated with either" (p.195). Nonetheless, the results of studies by (Foster, Tonkyn, & Wigglesworth, 2000) put emphasis on the priority of t-unit as the most popular unit for analyzing oral and written production.

Generally, the measures for assessing complexity can be divided into two parts, syntactic complexity and lexical variety. Syntactic complexity is a measure of the organization of the discourse content and the range of syntax used in a text (Wendel, 1997). (Skehan, 1996) calculated complexity with the amount of subordination (e.g., the number of clauses divided by t-units). (Yuan, 2001) defines t-unit as an independent clause together with any adverbial, complement or direct object added to it. (Ellis & Yuan, 2004) measured syntactic complexity similar to Skehan. They also measured syntactic variety by counting the total number of different grammatical forms of the verbs used by participants, tenses (e.g. past tense, present tense), modalities (e.g. have to, must), and voice (e.g. passive voice). Finally, for (Wolfe Quintero, et al., 1998) complexity is composed of grammatical and lexical complexity which means the ability to use a variety of words and structures in a limited period of time.

Lexical variety refers to the variety and richness of lexicon within a narrative and type-token ratio refers to the total number of different verbs, nouns, adverbs, adjectives with the exception of repeated words used in a text divided by the total number of words. The more the number of lexicon used in a text, the better will be the quality. Type token ratio has been the most frequent method of measuring lexical diversity, in which Type stands for the number of different words, divided by tokens which reflect the total number of words used in a text.

The problem with function words that are frequently repeated within the text as in (TTR) is also solved by (Ellis & Yuan, 2004) as they used (MSTTR), according which participants' narratives were divided into segments of words and then the type token ration of each segment is calculated. (Richards, 1987) declared that using type-token ratio is problematic since samples with large number of tokens produce lower TTRs than samples with small size, and TTR is not sensitive to sample size. According to Malvern and Richards (2000) this is because as the produced language samples are becoming longer, the number of new words (types) used available for the learners are decreasing compared with the number of all words (tokens). This makes the ratio to decline. However, the case is vice versa when the language sample is small.

(Malvern & Richards, 2000) believed that MSTTR removes the inadequacy of sample size problem and
respectively reduces data waste; however, some problems remain to be unsolved. Segments of less than 100 tokens seem to distort the results, transcripts cannot always be divided into equal sizes, different sizes of MSTTRs are not comparable and also some other problems. Thus, this study uses the parameter D to measure lexical variety by the use of computer software called VOCD. (Malvern and Richards, 2002) claim that:

The measure D overcomes the disadvantages of other measures, including MSTTR, first, because it is independent of sample size, thus allowing valid comparisons between speakers or writers who produce varying quantities of linguistic data. Second, because vocd takes numerous random samples from the whole of a transcript, it takes account of both long-distance and short-distance repetition, and no data remain unused. Finally, it is more informative because it is representative of the whole of the TTR vs. token curve rather than just a single point on it. (p. 91)

The provision of planning has showed positive effects for syntactic complexity (Crookes, 1989, Foster & Skehan, 1996; Mehnert, 1998; Ortega, 1999). The findings of these studies have revealed that planning conditions influences learners' production of subordination, and helps them produce longer sentence in comparison with unplanned condition. However, as for lexical variety, the results did not indicate similar effects. Additionally, most of the studies used TTR or MSTTR for measuring lexical diversity which in turn is a matter of question. To shed more light on the issue, the present study aims to investigate the effect of UPP and CSP on the two indices of complexity. CSP has been chosen, because as (Sangarun, 2005) says, this kind of planning leads learners to pay attention to the propositional content of the production and as a result produce more complex language.

1.2. Task Type

Previous research on the effects of planning on learners' aspects of production has employed variety of tasks such as narrating a story based on films and cartoons, or a set of pictures; decision making, argumentative, and expository task to elicit learner output (Wendel, 1997; Bygate, 2001; Ellis & Yuan, 2004). The results of the studies have revealed that there is a relationship between task type and learners' output in planned conditions.

Selecting the task is one of the main factors that affect performance during task completion (Skehan, 1996b). According to (Birjandi & Ahangari, 2008), the results of various studies show that task type affects accuracy and complexity of performance because it puts different amount of cognitive load on learners' memory. In an exploratory study (Matsumura, Kawamura, & Affricano, 2008) also found that there is a relationship between task-type and learners' language production.

Tasks can be classified in different ways. (Skehan, 1998) believes that different tasks might result in varying amount of dedication of attention to accuracy, fluency and complexity in planned output. Likewise, (Sangarun, 2005) verifies that there are relationships between planning and type of the task. Those tasks with clear and inherent structure appear to benefit accuracy while complex tasks lead to higher complexity in a planned condition (Skehan & Foster, 1997). Besides, (Newton and Kennedy, 1996) suggests that by using different tasks it is possible to predict the linguistic forms that will be produced by learners.

(Robinson, 2001) claims that it is the task that predisposes learners to prioritize aspects of language performance. He argues that complex tasks leads to producing more accurate and complex performances than fluent output. He concludes that although planning time frees up attentional resources and enable learners to attend to accuracy and complexity during L2 performance, but the task itself should have the potential to direct learners to this point. (Skehan & Foster, 1999) state that when there is a competition between accuracy and complexity if task type requires more complex language, accuracy will diminish. Furthermore, (Skehan, 1998) emphasizes that the following criteria should be taken into consideration while selecting a task. Tasks should be in an acceptable level of difficulty, focus on all three aspects of accuracy, fluency, and complexity, and be in parallel with task-based research. And finally, (Schmidt, 1990) proposes that tasks with appropriate difficulty level will give learners more chance for allocating of their attention; nevertheless, what exactly he means by appropriate difficulty is a matter of question until now.
1.3. **Theoretical framework**

Based on information processing theory, human beings have limited processing capacity and attention to one aspect of a task may cause less attention to the other (Anderson, 1983). A high level of mental processing which greatly increases when learners are engaged in producing a foreign language is required for language production. Learners especially those with low proficiency who are involved in the processes of language production, i.e. the Planning, the Translator, and the Execution (Anderson, 1983) encounter with a big mental challenge while producing language in real-time which leads to the production of dysfluent or inaccurate language (Skehan & Foster, 1999). According to (Skehan, 1996), this happens because of the trade-off between accuracy and fluency. Briefly, in cognitive psychology language production is an active and meaning-oriented process which applies to both writing and speaking. Based on Anderson's language production model which originates from information processing theory, there are three stages of language production. The first stage is for setting goals and selecting the information from our memory, while the second stage consists of finding the appropriate lexicon, applying rules and generating language constituents, and finally, the third stage is production. All the theoretical models which originate from information processing theory claim that learners are confronted with limited attentional capacity and this affects the allocation of attention to CAF and as a result learners produce a language which flaws regarding accuracy, fluency and complexity. Consequently, if learners are provided with any kind of planning conditions, this will free up their mental capacity to some extent and accordingly will make a great contribution to developing their language performance in terms of the three aspects of accuracy, fluency, and complexity.

1.3. **Research questions**

This study is an attempt to find answer to the following questions:

1. What is the effect of unguided pre-task planning on syntactic complexity and lexical variety of Iranian EFL learners?
2. What is the effect of content-focused strategic planning on syntactic complexity and lexical variety of Iranian EFL learners?

2. **Method**

This study is a single-factor between group designs. The design requires independent homogeneous groups for each treatment group. It is used to find out whether differences exist between treatment conditions. In this study pre-task planning as the independent variable is operationalised at three levels of (UPP), (CFS), and (NP). The scores of the groups of participants are analyzed and compared with each other in order to determine the effect of the different treatments. The dependent variable is complexity with the indices of syntactic complexity and lexical variety.

2.1. **Participants**

One hundred and two participants majoring in English were randomly selected from the Islamic Azad University and Payame Nour University (Ardabil Branch). The ages were 19 to 25. They were from an EFL milieu that have had little or no opportunity of being exposed to authentic language use in real-life situations except for classroom instruction. The participants were randomly assigned to three groups. Each group consisted of 34 participants.

2.2. **Instruments**

An Oxford proficiency test (OPT) was administered for the participants and based on the scores; they were randomly assigned to control and experimental groups. The groups were classified as no-planners (NP), unguided pre-task planners (UPP), and content-focused strategic planners such as (CSP). The first group was labelled as the control and the second two groups as experimental. To ensure the homogeneity of the groups, their scores in placement test were fed into SPSS and a one-way ANOVA was conducted. The result of the ANOVA yielded no significant difference across the groups (p= .849). Alternatively, the groups were taken to be homogeneous in terms
of their proficiency, so that the result of any experiment could be attributed to the treatment.

2.3. The task

The source of the task that has been chosen to be used in this study is an episode of Mr. Bean's series, season 1, and episode 14, directed by John Birkin in 1995. The selected episode is easy to follow and free from cultural bias.

2.4. Measures

Complexity was measured by the two indices of syntactic complexity and lexical variety. Syntactic complexity (SC) was measured by calculating the total number of clauses divided by the number of t-units, considering that each single t-unit has only one clause, and the minimum value of one will show an absolute lack of syntactic complexity. Parameter D was used to measure lexical variety by the use of computer software called VOCD. According to Richards and Malvern (2000) this measure overcomes the disadvantages of other measures, including Type-Token Ratio and MSTTR.

2.5. Planning instructions

Some of the earlier research studies have focused on the effects of planning on language performance and compared it with no-planning condition. Yet, a few of them have provided learners with general instructions on how to focus on form, meaning or both of them, e.g. think about what to say and how to say. Unlike NP group, the UPP group in this study were given 10 minutes to think about their productions in advance. For the CSP group the instructions directed learners' attention to consider readers' needs and interests and visualize the story in detail, think of ordering the sequences of events appropriately, plan in the target language, and not to write down everything in detail (Appendix A). This happens in the first stage of language production (The Planning) and for (Yuan & Ellis, 2003) paying attention to the first stage increases the complexity of language because learners have enough time to consider the propositional contents and encode the message which requires a range of grammatical forms. According to these principles and based on the following studies (Crookes, 1989; Ellis & Yuan, 2004; Foster & Skehan, 1996; Sangarun, 2005) planning instructions were prepared.

2.6. Procedure

The first group (NP) was required to watch an episode of Mr. Bean's series. Immediately after watching, the participants were told to write their account of watching in 14 minutes and at least with 200 words. The time was determined based on the pilot study conducted on the participants from the similar pool earlier, in which the fastest writer finished the task in 14 minutes. This was to exercise the real-time pressure while task production (Yuan & Ellis, 2003). The second group (UGP) watched the same film, however, after the film they were given 10 minutes to think about their productions in advance and then they started writing within the same time limitation as the previous group. The last group was the CSP. They also had similar processes with the difference that in addition to planning, this group was given some instructions on how to focus on the content of their productions.

All the groups were given a main task sheet to write their accounts of watching. The participants in planned groups were also given note-sheets to take notes while planning. This was to ensure that they were engaged in planning activity. The note-sheets were collected before the actual task performance. These sheets were taken to prevent students from coping directly from their notes and to ensure that they would cognitively engaged in planning.

3. Results

The complexity of the task was measured by the two variables 1) syntactic complexity (SC), dividing the number of clauses by the number of t-units which shows the extent to which the structures of the sentences are elaborate and 2) lexical variety (D) which reflects variety and richness of lexicon. Table 1 displays the descriptive statistics for SC among the groups.
Table 1 Descriptive statistics for syntactic complexity

<table>
<thead>
<tr>
<th>Planning condition</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP</td>
<td>34</td>
<td>1.16</td>
<td>.133</td>
</tr>
<tr>
<td>UPP</td>
<td>34</td>
<td>1.22</td>
<td>.167</td>
</tr>
<tr>
<td>CSP</td>
<td>34</td>
<td>1.24</td>
<td>.132</td>
</tr>
</tbody>
</table>

Based on Table 1, CSP is the most syntactically complex group. Following is the UPP group and the least complex is the NP group. To find out whether the differences among the groups are statistically significant, a one way ANOVA was conducted.

Table 2 One-way ANOVA Results for SC

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>.119</td>
<td>2</td>
<td>.059</td>
<td>2.804</td>
<td>.065</td>
</tr>
<tr>
<td>Within groups</td>
<td>2.096</td>
<td>99</td>
<td>.021</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2.214</td>
<td>101</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results of the test run revealed that the difference among the groups ($P=.065$) is not statistically significant. That is to say, although the mean for the variables in the groups is increasing and there is a tendency towards producing a more complex language; the data do not show any statistically significant differences across the groups.

The second variable for measuring complexity was lexical variety (D). Table 3 displays the mean and standard deviation for this variable among the groups.

Table 3 Descriptive statistics for lexical variety

<table>
<thead>
<tr>
<th>Planning Condition</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP</td>
<td>34</td>
<td>42.43</td>
<td>10.84</td>
</tr>
<tr>
<td>UPP</td>
<td>34</td>
<td>42.91</td>
<td>10.43</td>
</tr>
<tr>
<td>CSP</td>
<td>34</td>
<td>46.53</td>
<td>10.58</td>
</tr>
</tbody>
</table>

In general, there is an increasing trend from NP group to CSP group for the mean scores. ($M=42.43 < (M=42.91) < (M=46.53$). Therefore, as it could be expected, the CSP group has the highest mean score across the groups. Based on Table 4, the result of the ANOVA test run, demonstrate that although there is a tendency for producing a more lexically variant text; the results do not reflect any statistically significant difference across the groups ($P=.225$).

Table 4 One-way ANOVA Results for lexical variety

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>341.86</td>
<td>2</td>
<td>170.93</td>
<td>1.514</td>
<td>.225</td>
</tr>
<tr>
<td>Within groups</td>
<td>11173.69</td>
<td>99</td>
<td>12.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1515.56</td>
<td>101</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Discussion and Conclusion

This section discusses the findings of the study regarding the effects of the types of planning conditions on Iranian English as a foreign language learners' complexity of written task performance. The first research question addressed the effect of UPP on learners' complexity of production in comparison with NP.
It is essential to consider that the underpinning theory used in this study is information processing theory and the models that have been originated from it, especially Anderson's language production model (1983). According to this model, learners mostly face difficulty at the second stage of language production in finding the appropriate vocabulary and applying the rules due to limitations in attentional capacities in both speaking and writing. This makes them prioritize one aspect over the other, and this is intensified when the process is controlled than automatic. Also based on Skehan's model of limited attentional capacity (1996), learners have limited attentional resources and cannot attend to all aspects of language use (CAF) simultaneously. This is where the trade-off hypothesis is proposed by (Skehan & Foster, 1996) based on which learners pay attention to one aspect to the detriment of the other.

Based on the scores gained on the placement test, the participants of this study had proficiency level between low to intermediate which puts them in the limited language proficiency group. Hence, their access to lexis, spelling, syntax, and linguistic knowledge is mostly controlled rather than automatic. This puts a great deal of mental burden on their short-term memory which is restricted by the limitations. On the other hand, planning time provided for the planned groups prior to their production frees up a small amount of this limitation and makes it possible for them to think about their production in advance. This can be a reason for the increase in overall quality of production in the planned groups versus NP. Seemingly, NP group was under pressure to attend to this aspect of the production and produced a less complex text in comparison with the planned group which was under less time restriction than their counterparts. As a result, the findings of the study once again confirmed the idea of limited processing capacity, and learners’ difficulty in allocation of attention between aspects of language use.

On the other hand, although there have been some improvements, the results did show significant differences. This could be due to the fact that "Monologic tasks like cartoon narratives, particularly when they have straight forward structure of events, are not assumed to prompt embeddings or subordinations"(Rouhi, 2006, p.136). This means that the tasks which are interactive and require more reasoning, lead to more complexity than monologic tasks. The findings of the following studies are also in line with this study regarding complexity in both oral and written task production (Tajima, 2003; Rouhi, 2006).

The second research question looks for the effect of CSP on complexity of production. The findings reveal that this condition is superior to NP group regarding the complexity of language performance; however, the differences are not statistically significant. This increase can be explained by taking into account Anderson's language production model. CSP condition reduces the processing load in the planning stage of the production (based on the given instructions) and encourages learners to take advantage of the opportunity and think about the appropriate content in advance; this frees their mental pressure in Translator stage and allows them to produce a more elaborate language regarding complexity. In contrast, the NP group did not have the time available as for CSP group and this makes them produce the content and language of their productions on-line (Sangarun, 2001). Participants in NP group are under the pressure of limited attentional capacity in the planning and translator stage and as a result they produce a simpler language than CSP in terms of complexity.

Increase in syntactic complexity shows that planning and instructions have helped learners focus on the "propositional content of the story" and determine the main narrative events as (Ellis & Yuan, 2004, p.78) have maintained. This tendency toward focusing on the events requires learners to think of various lexicons which as a result affects lexical variety. However, the fact that learners' lexical variety is not significantly affected could be due to their limited vocabulary storage, and undoubtedly, only a short period of time will not increase their existing knowledge of lexicon. Meanwhile, taking into account the limitation of attentional resources and learners' search for applying all aspects (lexis, content, organization, grammar, etc.) they tend to the aspect which they have the knowledge of it and is easily accessible. Regarding lexical variety index of complexity, planning has increased the opportunity for learners to search for appropriate lexicon and affected complexity to some extent. However, the fact that CSP group was expected to be significantly more complex than NP group did not come out to be true.

What is lacking here is the effect of given instructions which were expected to be apparent in increasing the complexity indices of the production. This can be explained for two reasons: First, as already mentioned the design of the task had a clear inherent structure that even guidance did not prompt a complex language as (Skehan &
Foster, 1996) have mentioned; second the results of the participants’ scores attained in placement test also show their limited proficiency in their language ability which can be another reason which may account for their not having been able to produce complex language considering that paying attention to complexity is rather risky and learners prefer to be on the safe side. On the other hand, (Wigglesworth, 1997) also pointed out that learners with high proficiency level would benefit from pre-task planning more than those with low proficiency.

References

### APPENDIX A

Guidelines and note-sheets adapted from (Sangarun, 2005) and (Foster & Skehan, 1996) for (CFS) Group

<table>
<thead>
<tr>
<th>Planning the content you need:</th>
</tr>
</thead>
<tbody>
<tr>
<td>You have just watched an episode of Mr. Bean's film. You have 10 minutes to think and plan your account of watching. You can make notes during your planning time. Please write your notes in English, but try not to write everything in detail because you are not allowed to use your notes while writing. Suppose that nobody has seen this film before and you are going to write a story about it, so try to be detailed about it. After 10 minutes of planning time you will be given a blank sheet of paper to write your account of watching.</td>
</tr>
<tr>
<td>Follow these steps and use this note-sheet to plan your narrative writing.</td>
</tr>
<tr>
<td>1. Visualize the story, how, where, when, and what is happening.</td>
</tr>
<tr>
<td>2. Plan what you want to write based on what you saw in the film.</td>
</tr>
<tr>
<td>3. Think of the ways you can write the story in order to be interesting for the readers.</td>
</tr>
<tr>
<td>4. Develop the story and order the steps in correct sequences, so that it can be understandable to the reader.</td>
</tr>
<tr>
<td>Write your notes according to the above-mentioned here.</td>
</tr>
<tr>
<td>Planning the content you need:</td>
</tr>
</tbody>
</table>