# Chapter IV

## Task Complexity along +/- Planning Time and +/-Here-and-Now

### 4.1 Introduction

As was seen in the previous chapter, in the last two decades a considerable research effort has been made to study the different features involved in task design, as well as the effects of their manipulation on oral production. Different perspectives, however, have had different research agendas and interests.

From an interactionist perspective, task features have been manipulated in order to test their effects on promoting negotiation of meaning, which has been claimed to lead to second language acquisition. This line of research has been mainly concerned with features such as how information flows (one-way versus two-way), the convergence or divergence of task goals (convergent versus divergent), and whether tasks have a single outcome or a variety of them (closed versus open).

Other lines of research have been concerned with the implementation of a number of features which can be manipulated to increase or reduce the cognitive demands of tasks, such as the amount of pre-task planning time, the degree of prior knowledge, or the degree of displaced, past time reference, among others. Springing from a communicative language teaching tradition, a number of studies have investigated the effects of manipulating planning time on oral production (Ellis, 1987; Crookes, 1989; Williams, 1992; Foster & Skehan, 1996; Ting, 1996; Skehan &

Foster, 1997; Wigglesworth, 1997; Mehnert, 1998; Ortega, 1999; Yuan & Ellis, 2003). The goal behind such research has been to retrieve information for syllabus designers and teachers to organize tasks in such a way that they will foster a balanced interlanguage development in the areas of fluency, accuracy, and complexity. As Skehan (1996:22) suggests fluency "concerns the learner's capacity to produce language in real time without undue pausing and hesitation". Complexity "concerns the elaboration or ambition of the language that is produced" (Skehan, 1996:22), and it usually refers to both structural complexity and lexical variety. Finally, accuracy has to do with the "extent to which the language produced conforms to target language norms" (Yuan & Ellis, 2003:2).

Other researchers have been interested in how information about the effects of increasing cognitive demands on production can be used to make prospective sequencing decisions, so as to organize pedagogic tasks from simple to more complex approximations to real world tasks (Robinson, 1995a; Rahimpour, 1997; Niwa, 2000; Robinson, 2001a, 2001b, 2003, forthcoming; Iwashita et al., 2001). While the first approach, the interactionist one, has ignored issues of Task Complexity and has focused on the interactive conditions in which tasks take place, the two latter approaches have researched the consequences of manipulating cognitive demands of tasks on production.

The following section reviews the research that has been carried out on the two independent variables researched in this study, and will specifically focus on the evidence related to narrative tasks. The types of tasks, the predictions made, the

measures used, and the results obtained will be presented for each study. So this chapter will try to answer the following two questions:

i) How does the manipulation of planning time affect the fluency, complexity, and accuracy of L2 learners' production?

ii) How does the manipulation of the degree of displaced, past time reference affect the three production areas of L2 speakers?

In the last section of this chapter, the specific questions and hypotheses addressed by this study will be presented.

## 4.2 Planning time and +/- Here-and-Now studies

The following sections describe the research conducted on the two measures at stake. They summarize the information about the objectives and predictions, the methods that were employed, as well as the most significant findings and interpretations of each study, which should serve as a point of reference to the experiment described in the following chapter. The discussion of the findings of each study will be briefly mentioned here and will be elaborated on in Chapter VII, where the findings of the experiment in this study are discussed.

### 4.2.1 Planning time studies

What research evidence has shown so far is that giving learners extended planning time before task performance seems to have beneficial effects for fluency and complexity, while the picture for accuracy is not so clear (See Table 16 at the end of this section). As we will see below, providing extended 'on-line' (i.e. during performance) planning time has shown to have positive effects for accuracy (Yuan & Ellis, 2003).

From a variationist stance, Ellis (1987) looked into how different levels of planned discourse affect learners' written and oral performance. He operationalized three different degrees of planned discourse. In the most planned condition, learners were given a coherently organized set of picture prompts and were required to narrate the story in writing. The second degree of planning required learners to narrate the story orally without having access to the previously written version. In the least planned of all conditions, learners were asked to narrate a story orally to a new set of pictures. He hypothesized that access to forms that have not been fully automatized, such as the third person '–s' or regular past '-ed', would benefit from planning time. Ellis used three measures of accuracy but he neither measured fluency nor complexity. The SOC[1] of regular past tense, the SOC of irregular past forms, and SOC of copula were the three measures used in Ellis's study. Ellis found that performance on the regular form of the past time declined as

[1] SOC stands for Suppliance in Obligatory Contexts.

learners had less time to plan their narratives. The accuracy in the use of irregular past forms was not affected by the different levels of planning. His main conclusion was that increased planning time leads to higher accuracy of rule-based language, while unplanned discourse is more lexical in nature.

Foster and Skehan (1996) manipulated planning time on three different task types: a personal information gap task, a narrative task, and a decision-making task. They characterized the personal task as the easiest and most accessible to learners, and that the narrative and decision tasks would be similar to one another. The control group had no planning time, one experimental group had 10 minutes to plan, and a second experimental group was also given 10 minutes as well as some guidance as to how to plan by considering syntax, vocabulary, content, and organization of what was to be said. They predicted that planning would make language more fluent, more structurally complex, and more accurate, and even more so when guidance as to how to plan was provided. Fluency was measured by counting the number of reformulations, replacements, false starts, repetitions, hesitations, and 1-second pauses. Complexity was measured by counting the number of clauses per C-unit[2], and syntactic variety by calculating the different verb forms used. Accuracy was calculated by means of the percentage of error-free clauses. Foster and Skehan found a significant effect for two measures of fluency, number of pauses and total silence, and found that the personal task triggered the most fluent speech; complexity, in terms of sentence nodes per C-units, was higher

[2] Foster and Skehan (1996:310) defined C-units as "each independent utterance providing referential or pragmatic meaning. Thus, a C-unit may be made up of one simple independent finite clause or else an independent finite clause plus one or more dependent finite or nonfinite clauses".

for the detailed planning group than for the undetailed planning group. The undetailed planning group, in turn, triggered higher levels of complexity than the group without planning. They, however, got mixed results for accuracy, the undetailed planning group obtaining more error-free clauses. As far as task types are concerned, the 'easiest' task (i.e. the personal information gap task) generated the most fluent speech. What they predicted would be the least complex task, the narrative one, triggered the most complex speech but the lowest levels of accurate language. This result ran against their prediction that the decision-making task would produce the most complex language. They showed that the narrative task and the decision-making task benefited more from planning than the personal information gap task, in which students had a higher degree of familiarity with the task content and, therefore, found it easier. They concluded that there are 'tradeoff' effects between complexity and accuracy, especially with narrative tasks, in which attention devoted to complexity has negative effects for accuracy. This was not the case with decision-making tasks, in which accuracy and complexity were more balanced.

In a subsequent study, Skehan and Foster (1997) used the same kind of task types as in their 1996 study, and with the same kind of predictions as to how planning time would affect performance. This time, however, they operationalized a post-task requirement in which learners were told that they would go public, which they predicted would result in higher levels of accuracy. The measures used this time were the number of pauses for fluency, the number of clauses divided by the

total number of C-units for complexity, and the percentage of error-free units for accuracy. This second time their results showed that planning could be associated with greater fluency and accuracy, the latter only affecting the personal and the narrative tasks. Greater complexity associated with increased planning was only found for the personal and the decision-making task but not for the narrative. They also measured the impact of knowing that there would be a post-task public performance and found that it affected only fluency, the post-task group being less fluent. Skehan and Foster suggested once again that accuracy and complexity are in competition for attentional resources when task demands are increased along planning time. They therefore concluded that planning time can only be channeled to one of the aspects (either accuracy or complexity), and not to the two dimensions simultaneously.

Mehnert (1998) confirmed Skehan and Foster's limited capacity model. In a study with two task types varying in complexity, a simple instruction task and a complex exposition task, Menhert compared the effects of allotting no planning time, one minute, five minutes, and ten minutes to four different groups. Mehnert followed Foster and Skehan (1996) and Skehan and Foster (1997) and hypothesized higher fluency, complexity, and accuracy for planned tasks. He also hypothesized that the longer the time allotted to pre-task planning, the stronger the predicted effects would be. His last prediction was that the most cognitively complex task would benefit most from planning time. For fluency he measured the total length of speech, one-second pauses in the first three minutes of the recorded task, the

percentage of pauses out of the total time, the mean length of run (i.e. number of syllables between two pauses), and the speech rate both with and without repetitions and reformulations[3]. Complexity was measured by calculating the number of sub-clauses divided by the total number of T-units[4], as well as by calculating the number of sentence nodes divided by the number of T-units. Accuracy was measured by counting the percentage of error-free units, the number of errors in one hundred words, as well as by specifically counting the number of word order errors and lexical choice errors. His overall results showed that engaging in extended planning time before carrying out a task had positive effects for performance. Regarding each specific measure, he found that planners who had 10 minutes were more fluent, more accurate, and more lexically dense than non-planners, with no significant differences in structural complexity. He found, however, that when learners had a short time for planning (one minute), they focused more on accuracy, whereas when they had longer time to prepare (10 minutes), they tried to produce more complex speech at the expense of accuracy, suggesting that any gains in accuracy and complexity are not achieved simultaneously. As opposed to Skehan and Foster who found that planning time was more beneficial for more complex tasks, Menhert did not find a significant interaction effect between task type and planning time. Menhert suggested, though, that tasks with a clear structure not requiring learners to express complex ideas tend

[3] For 'unpruned' Speech Rate A, Mehnert calculated the number of syllables per minute. For 'pruned' Speech Rate B, he calculated the number of syllables per minute but without repetitions and reformulations.

[4] T-unit has been traditionally defined as "a main clause plus any other clauses which are dependent on it." (Foster et al, 2000:360).

to promote fluency and accuracy, whereas when complex ideas need to be expressed, focusing on complexity has detrimental effects for fluency and accuracy.

In contrast to previous suggestions, Ortega (1999) questioned the limited processing capacity model in which the three dimensions of production enter into competition, arguing that previous studies had neglected the investigation of the planning process. In a study of oral narrative discourse under a 10-minute planning condition and a no-planning condition with learners of Spanish, Ortega found similar results regarding production to previous studies. The two general questions in her study were whether planning time would increase the syntactic complexity, lexical range, accuracy, and fluency of planned output, and how planning time was used by learners. For complexity measures, Ortega calculated the number of words per utterance and type-token ratios; target-like use of noun-modifier agreement and the Spanish article system was used for accuracy measures, and pruned speech rate in syllables per second was used to measure fluency. Her results showed that complexity and fluency were enhanced by pre-task planning, whereas mixed results were found for accuracy. She went beyond previous studies and included retrospective interviews in order to find out more about the quality of pre-task planning, in term of focus on form and strategic planning. She advanced that planning had two kinds of impact on learners: first, planning reduces the cognitive load and communicative stress, which in turn may ease on-line performance with visible effects on linguistic product; second, freed-up attentional resources caused by planning lead learners to evaluate task demands, check their available resources,

and strategically plan attention and effort. Her results also showed different orientations of learners with regard to form and meaning. Some learners were more concerned with the linguistic content of their narratives, whereas other were more concerned with taking the perspective of their listeners to make their meaning come through. Learners reported that they focused on form by using their notes to work at the morphosyntactic level, by paying attention to their own weaknesses, by stretching their interlanguage, and by monitoring their output. Ortega concluded that a number of factors affect the quality of planning. Firstly, she suggested that Task Complexity may play a role in the sense that cognitively complex tasks may benefit more from planning than simple ones. Secondly, she suggested that the operationalization of planning is important in the sense that developmental readiness and task essentialness need to be taken into account. Thirdly, learner orientation towards form or meaning also plays a role. In the fourth place, learner proficiency needs to be brought into the picture since she speculated that higher level students may benefit more and differently from planning than lower-level students. Finally, she suggested that proficiency should be a moderating factor in the limited processing capacity model.

Springing from a concern with the mixed findings regarding accuracy, Yuan and Ellis (2003) operationalized the construct of 'online' planning[5], which they presented in contrast with no planning and pre-task planning. An oral narrative was used in the study. They predicted higher fluency for pre-task planners and

[5] Pre-task planners were given a limit of 5 minutes to narrate the tasks, while 'on-line' planners were given 'unlimited' time to produce their narratives.

lower for non-planners and on-line planners. They hypothesized higher complexity for the pre-task planning condition but applied the null hypothesis to the on-line planning one. They foresaw that accuracy would increase with on-line planning but not with pre-task planning. Fluency was measured by the number of syllables per minute. Three measures of complexity were used: the number of sentence nodes per T-unit, the variety of verb forms used, and the mean segmental type-token ratio[6]. For accuracy, a general measure of error-free clauses was used. They worked with three different conditions: a group in which learners did not have any planning time available before performance and had limited time for performance; a group that had 10 minutes of planning time but also had restricted time for performance; and a third group that had no pre-task planning time but had unlimited time to carry out the task. Yuan and Ellis found that whereas pre-task planning time promoted higher complexity and lexical variety, it did not have significant effects on accuracy, in line with what several previous studies had also found. Extended on-line planning with no pre-task planning, despite having negative effects for lexical variety, also had a beneficial effect for complexity and, most importantly, for accuracy. Learners who were given unlimited of time during performance were less fluent but reformulated and self-corrected their speech more, by drawing on their explicit knowledge, which as a consequence led to a more accurate performance. They also confirmed the trade-off effect in language production, especially of learners

[6] The mean segmental type-token ratio (MSTTR) tries to avoid the problems of the traditional type-token ration, which has been shown to be sensitive to text length. The MSTTR divides narratives into segments of forty words. Then the total number of different words is divided by the total number of words in the segment to calculate type/token ratios. Then the mean scores for each participant's segments are added and divided the total by the total number of segments in the narrative.

Table 16

*Planning Time studies.*

| Studies | Task types | Operationalization | Measures | Design and statistical analysis | Findings |
|---|---|---|---|---|---|
| Ellis, 1987 | Picture stories. | Condition 1: learners write a story from a coherent set of pictures.<br>Condition 2: learners narrate task orally but no access to previously written story.<br>Condition 3: learners narrate task orally to a new set of pictures. | Accuracy: SOC of regular past tense, SOC of irregular past forms; SOC of copula. | Repeated measures and chi-square calculation. | Accuracy of regular past tense declined with lack of planning time. No differences for irregular past forms between different conditions. |
| Foster & Skehan, 1996 | Personal information gap.<br>Narrative task.<br>Decision-making task. | Control group: no planning time.<br>Experimental group 1: 10 minutes of pre-task planning time.<br>Experimental group 2: 10 minutes & guidance as to how to plan. | Fluency: No. of reformulations, replacements, false starts, repetitions, hesitations, and 1-second pauses.<br>Structural complexity: clauses per C-units; variety of verb forms.<br>Accuracy: percentage of error-free clauses. | Between groups and ANOVAs. | Fluency was significantly increased by planning time. Complexity was higher for the detailed planning group than others. Undetailed group produced a higher percentage of error-free clauses. Against their predictions, the narrative task was the most complex but the least accurate of all tasks. They concluded 'trade-off' effects exist between accuracy and complexity. |
| Skehan & Foster, 1997 | Personal information gap.<br>Narrative task.<br>Decision-making task. | Control group: no planning time<br>Experimental 1: 10 minutes.<br>Experimental 2: 10 minutes & requirement to go public (post-task). | Fluency: No. of pauses.<br>Complexity: number of clauses divided by number of C-units.<br>Accuracy: percentage of error-free units. | Between groups and ANOVAs. | Planning time was associated with fluency and accuracy for the personal and narrative tasks. Greater complexity associated with increased planning for the decision-making task. Only fluency was significantly lower for the post-task group. They confirmed that only one of the two dimensions can be attended to, that is, either complexity or accuracy but not both. |

| Studies | Task types | Operationalization | Measures | Design and statistical analysis | Findings |
|---|---|---|---|---|---|
| Mehnert, 1998 | Instruction task. Complex exposition task. | Control group: no pre-task planning time.<br>Experimental 1: 1 minute.<br>Experimental 2: 5 minutes.<br>Experimental 3: 10 minutes pre-task planning time. | Fluency: total length of speech, 1-second pauses, percentage of pauses, mean length of run, and pruned and unpruned speech rate.<br>Structural complexity: No. of clauses and sentence nodes per T-unit.<br>Lexical complexity: weighted lexical density.<br>Accuracy: percentage of error-free T-units, percentage of errors (word order and lexical choice errors). | Between groups and ANOVAs. | 10-minute planners were more fluent, accurate, and more lexically dense than non-planners, with no differences for structural complexity. With more time, learners tended to focus on complexity at the expense of accuracy, suggesting that any gains in accuracy and complexity are not achieved simultaneously. He found that planning time was more beneficial for more complex tasks. |
| Ortega, 1999 | Story-retelling oral task. | Experimental 1: no pre-task planning time.<br>Experimental 2: 10 minutes planning time. | Fluency: pruned speech rate.<br>Structural complexity: number of words per utterance.<br>Lexical complexity: type-token ratio.<br>Accuracy: TLU of noun-modifier agreement and TLU of articles. | Between groups and ANOVAs. Retrospective protocol analysis. | Fluency and complexity were enhanced by pre-task planning time mixed results were found for accuracy. She concluded that planning time reduces cognitive load and communicative stress, and that it is used to evaluate task demands, check available resources, and strategically plan performance. She suggested that factors such as complexity, proficiency, and general learners' orientation toward meaning or form mediate performance. |
| Yuan & Ellis, 2003 | Narrative task. | Experimental 1: no pre-task planning time.<br>Experimental 2: 10 minutes planning time<br>Experimental 3: no pre-task planning time but 'on-line' planning time. | Fluency: speech rate.<br>Structural complexity: sentence nodes per T-unit, variety of verb tenses.<br>Lexical complexity: mean segmental type-token ration.<br>Error-free clauses. | Between groups and ANOVAs. | Pre-task planning time promoted higher structural and lexical complexity with no differences for accuracy. On-line planning time had beneficial effects for structural complexity and accuracy. The found the main 'trade-off' effect to exist between fluency and accuracy. Pre-task planning time enhances fluency while on-line planning time enhances accuracy at the expense of fluency. |

with limited L2 proficiency. Since they found that both pre-task planning and on-line planning promote higher accuracy, they concluded that the main trade-off effect is between fluency and accuracy. If learners are given time to plan prior to task performance, they prioritize fluency. If they are given time to plan on-line, they may pay more attention to accuracy at the expense of fluency. Finally, Yuan and Ellis detailed the trade-off effect further by showing that pre-task planning increases lexical variety but not grammatical accuracy, whereas on-line planning improves grammatical accuracy over lexical variety.

With the review of the findings of planning time studies, a summary of which is included in the previous two pages, the first question that was posed at the onset of this chapter has been addressed. We now move on to review the studies concerned with the degree of displaced, past time reference.

### 4.2.2 +/- Here-and-Now studies

In general, tasks in the There-and-Then have been shown to be more cognitively demanding than tasks performed in the Here-and-Now, with specific consequences for production (See Table 17 on page 189).

Robinson (1995a) investigated the impact of manipulating Here-and-Now on three different narratives. In the Here-and-Now condition, learners were asked to narrate a comic strip in the present tense while looking at it. The There-and-Then was operationalized by having the students narrate the story in the past tense and without visual support during performance. Such operationalization was based on

both L1 and SLA findings that had shown that displaced, past time reference is more complex and therefore appears later than present, context-supported reference. Robinson predicted less fluent speech for There-and-Then tasks but higher lexical and structural complexity as well as accuracy for There-and-Then tasks. Fluency was measured by calculating the number of pauses and the number of words per utterance; accuracy by calculating the percentage of target-like use of articles; structural complexity by measuring the number of sentence nodes per T-units, and the number of multipropositional utterances; and lexical complexity by calculating the percentage of lexical words in the narratives. Robinson found that the most complex narrative, performed in displaced past time reference, elicited more accurate speech and more lexical complexity than the narrative performed in the Here-and-Now. It also showed a trend for greater dysfluency but showed no significant differences for structural complexity.

Rahimpour (1997) extended Robinson's research by crossing a complexity variable (Here-and-Now) with a condition variable (open vs. closed). Rahimpour operationalized three levels of complexity by including a narrative in the Here-and-Now, one in the There-and-Then, and one in the Here-and-Now/There-and-Then. Rahimpour hypothesized that the Here-and-Now/There-and-Then narrative would be more complex than the other versions of the task. Fluency was measured by calculating the number of words per pause; structural complexity was measured via the number of S-Nodes per T-unit; lexical complexity by calculating the percentage of lexical words; and accuracy by measuring the number of error-free units and

target-like use of articles. Rahimpour's results showed that learners who carried out the most complex versions of the task were significantly less fluent, with no significant differences regarding either structural or lexical complexity, and with significant improvements with regard to error-free units but not target-like use of articles.

From an interest in language testing, Iwashita et al. (2001) investigated the effects of manipulating complexity on L2 learners' fluency, complexity, and accuracy. They established 8 levels of complexity along four dimensions: i) +/- perspective, that is, whether the learner was speaking as if the story had happened to her or not; ii) +/- immediacy, that is, in the Here-and-Now or in the There-and-Then; iii) +/- adequacy, that is, whether the set of pictures was complete or incomplete; iv) +/- planning time, which they operationalized as either 3.5 minutes or 0.5 minutes. Following Skehan's (1996, 1998) predictions for task difficulty, they hypothesized that less difficult versions of tasks would trigger more fluency and accurate but less complex speech. This prediction was the same for the four conditions, and they therefore predicted higher fluency and accuracy but lower complexity for the easy version of the four conditions, that is, tasks narrated as if they had happened to the learners, told in the Here-and-Now, with the complete set of pictures, and with 3.5 minutes of pre-task planning time. They calculated the number of repetitions, false starts, reformulations, hesitations, and pauses as measures of fluency. They operationalized complexity as the number of clauses divided by the number of C-units. Accuracy was measured by calculating the

Table 17

*Here-and-Now/There-and-Then studies.*

| Studies | Task types | Operationalization | Measures | Design and statistical analysis | Findings |
|---|---|---|---|---|---|
| Robinson, 1995a | Narrative strips. | Here-and-Now: in the present and while looking at the comic strip.<br>There-and-Then: in the past tense and without looking at the comic strip. | Fluency: No. of pauses, number of words per utterance.<br>Structural complexity: the number of sentence nodes per T-unit, the number of multi-propositional utterances.<br>Lexical complexity: the percentage of lexical words out of the total number of words.<br>Accuracy: percentage of TLU of articles. | Between groups.<br>Narrative strips counterbalanced.<br>MANOVA and ANOVAs. | The most complex narrative, in the There-and-Then, elicited more accurate and lexically complex than the Here-and-Now narrative. He also found a trend for greater dysfluency and no significant differences for structural complexity. |
| Rahimpour, 1997 | Narrative strips. | Here-and-Now: in the present and while looking at the comic strip.<br>There-and-Then: in the past tense and without looking at the comic strip.<br>Here-and-now/There-and-then: a combination of the previous two.<br>Open and closed versions of the tasks were used. | Fluency: the number of words per pause.<br>Structural complexity: the number of sentence nodes per T-units.<br>Lexical complexity: the percentage of lexical words.<br>Accuracy: No. of error-free T-units, TLU of articles. | Repeated measures, Latin square design.<br>MANOVA and ANOVAs. | Learners who carried the most complex versions of the task were significantly less fluent, with no significant differences regarding neither structural nor lexical complexity. He also found higher accuracy for complex tasks for error-free T-units but not for TLU of articles. |
| Iwashita et al., 2001 | Narrative strips. | +/- perspective: story narrated either as it happened to speaker or to someone else.<br>+/- immediacy: either in the Here-and-Now or in the There-and-Then.<br>+/- adequacy: either a complete set of picture or an incomplete set of pictures.<br>+/- planning time: either 3.5 minutes or 0.5 minutes. | Fluency: No. of repetitions, false starts, reformulations, hesitations, and pauses.<br>Complexity: the number of clauses divided by the number of C-units.<br>Accuracy: the percentage of error-free units. | Repeated measures.<br>MANOVA and ANOVAs. | Against their predictions, they found no significant differences among the different levels of complexity for any of the measures except for accuracy. There-and-then tasks generated higher levels of accuracy as measured by the percentage of error-free units. |

percentage of error-free clauses. Iwashita et al. found that there were no significant differences between easy and difficult versions of tasks except for accuracy. In the case of immediacy, they found that the more difficult version of tasks, that is, in There-and-Then, triggered higher levels of accuracy, which went against their prediction.

The review of studies concerned with increasing complexity along the +/- Here-and-Now variable (See summary on the previous page) has been an attempt at answering the second question that was asked at the beginning of this chapter.

### 4.2.3 Summary of +/- Planning time and +/- Here-and-Now studies

In general planning time studies have shown that increasing task demands by reducing pre-task planning time has negative effects for the fluency, complexity, and accuracy of L2 learners. In contrast, reducing Task Complexity by allotting sufficient pre-task planning time has positive effects for all the areas of task production albeit, according to some authors, not simultaneously. Planning time studies have consistently shown that fluency increases if learners are given time to prepare the task at hand (Foster & Skehan, 1996; Skehan & Foster, 1997; Ortega, 1999, Yuan & Ellis, 2003). Providing planning time prior to task performance has generally been shown to have a positive effect on structural complexity (Foster & Skehan, 1996; Ortega, 1999; Yuan & Ellis, 2003; only a trend in Skehan & Foster, 1997) and no significant effects on lexical complexity (Ortega, 1999; Yuan & Elllis,

2003). Mixed results have been obtained with regard to accuracy. Some studies have shown significantly more accurate learner performance under planned conditions (Foster & Skehan, 1997); no significant differences in performance between unplanned and planned narratives (Foster & Skehan, 1996; Yuan & Ellis, 2003), and some others have displayed mixed results (Ortega, 1999 found significant differences for TLU of noun-modifier agreement but not for TLU of articles). These results have led some researchers (Skehan, 1996; 1998) to suggest that learners cannot attend to both complexity and accuracy simultaneously although, as was also seen, other researchers (Ortega, 1999) have suggested that this may be explained by considering other factors such as Task Complexity, learners' proficiency, or learners' orientation towards meaning or form.

The overall findings of +/- Here-and-Now studies have been relatively consistent, too. Hence, increasing task demands by increasing the degree of displaced, past time reference has displayed a strong trend towards reducing learners' fluency (Robinson, 1995a; Rahimpour, 1997). Regarding accuracy, all the studies have shown gains in accuracy when performing more complex tasks (Robinson, 1995; Rahimpour, 1997; Iwashita et al., 2001). Improvements in accuracy have been accompanied by gains in lexical complexity (Robinson, 1995a; Rahimpour, 1997), hence contradicting the limited-capacity explanation of attention which is usually associated with planning time studies. No significant differences have been found between Here-and-Now and There-and-Then tasks regarding

structural complexity. Thus, such results have suggested the possibility that complexity and accuracy may be attended to simultaneously.

### 4.3 The subjective perception of Task Complexity

So far we have reviewed a number of studies which have operationalized different degrees of Task Complexity by manipulating either the pre-task or on-line planning time allotted to task performance or the degree of displaced, past time reference. However, before we move on to present the questions and hypotheses related to the experiment in this study, it should be pointed out that none of those studies has verified whether the intended operationalization of Task Complexity corresponds to the learner's perception of the different levels of Task Complexity.

As was seen in Section 3.3.6, in a study which researched the effects of increasing complexity along the number of elements in a map task, Robinson (2001a) used a 9-point Likert scale to measure learners' responses to questions about 5 affective variables associated with task performance. The five items included in the questionnaire, which were presented as dichotomies in the questions, were difficulty ('I thought this task was easy'/'I thought this task was difficult'), stress ('I felt relaxed doing this task/ 'I felt frustrated doing this task'), confidence ('I didn't do well on this task'/'I did well on this task'), interest ('This task was not interesting'/'This task was interesting'), and motivation ('I don't want to do more tasks like this'/'I want to do more tasks like this'). Robinson's aim was to find

whether his operationalization of Task Complexity along the number of elements corresponded to learners' perception of difficulty. He discovered that although, as he expected, more complex tasks were perceived as more difficult, stressful, and triggered a lower perception of confidence, no differences existed between levels of Task Complexity in terms of interest or motivation. Finally, the calculation of correlations between production variables and affective variables showed that fluency correlated with learners' perception of ability to complete the task on both simple and complex versions.

As will be discussed in detail later on in this chapter, it is the aim of this research to determine whether the different degrees of Task Complexity proposed for the experiment in this study correspond to the learners' subjective, affective perception of such an operationalization.

### 4.4 Research goals

The general goal of this experiment is to test the impact of simultaneously increasing Task Complexity along planning time and the +/- Here-and-Now variable on learners' accuracy, complexity, and fluency.

It extends previous research in at least four ways. Firstly, it provides further evidence about the effects of manipulating planning time on both simple Here-and-Now and complex There-and-Then versions of a task, on the one hand, and about the impact of increasing complexity along the Here-and-Now under unplanned and

planned conditions on the other. Secondly, it provides new evidence about the effects of combining the two variables simultaneously. Thirdly, it tries to establish which of the two variables has the greater impact on the different dimensions of production. Fourthly, it connects the effects of Task Complexity on performance to learners' subjective perception of difficulty, stress, confidence, interest, and motivation.

In the following sections, the questions posed and hypotheses advanced by the study will be presented. The following chapter will provide a description of the experimental design, participants, tasks, procedures, measurements, and statistical analyses used in this experiment.

### 4.5 Questions and Hypotheses

The study will try to answer the following questions:

Question 1: How does manipulating complexity simultaneously along planning time and +/- Here-and-Now affect production?

Question 2: Which of the two variables has the greater impact on production?

### 4.5.1 Hypothesis 1: Effects of manipulating planning time on production

**Hypothesis 1**: Planning time will positively affect production relative to lack of planning time.

I hypothesize that narrative tasks performed under planned conditions will elicit more fluent, and more structurally complex speech than under unplanned conditions, with no significant differences for lexical complexity and accuracy. This will happen in both simple (Here-and-Now) and complex (There-and-Then) versions of tasks[7].

### 4.5.2 Hypothesis 2: Effects of manipulating +/- Here-and-Now on production

**Hypothesis 2**: There-and-Then tasks will be more accurate and complex but less fluent than Here-and-Now tasks.

I hypothesize that narratives performed in the Here-and-Now will trigger more fluent, less structurally and lexically complex and less accurate speech than tasks

[7] It is important to note that studies of the effects of planning time on production have always used the simplest version of narrative tasks, that is, in the Here-and-Now. It is therefore possible that the simultaneous manipulation of the two variables will interact in unpredictable ways. Although with proportionally different results, it is believed that predictions regarding fluency, complexity, and accuracy for simple tasks will hold for tasks performed in the There-and-Then.

performed in the There-and-Then. This will happen both under unplanned and planned conditions[8].

This hypothesis relates to Robinson's (2003a, forthcoming) proposed effects of Task Complexity on production along resource-directing dimensions, as well as to the findings of Robinson (1995a) and Rahimpour (1997). Robinson, who has questioned the limited-capacity model and suggested that form and content may not always be in competition for attentional resources, has suggested that accuracy and complexity will be higher with more complex tasks.

### 4.5.3 Hypothesis 3: Effects of manipulating planning time on simple and complex tasks

**Hypothesis 3**: Planning time will facilitate performance of There-and-Then tasks more than of Here-and-Now tasks.

I hypothesize that the effect of increasing complexity along planning time will be greater on the complex (There-and-Then) version of tasks than on the simple (Here-and-Now) version of tasks. This will be examined by calculating the mean difference between a complex (There-and-Then) task performed under planning

[8] Again, the Here-and-Now variable has only been tested under unplanned conditions in order to enhance its effect. With proportionally different results due to the availability of planning time, I believe that the predictions for Here-and-Now and There-and-Then versions regarding fluency, structural complexity, lexical complexity, and accuracy under unplanned conditions will hold for planned tasks.

conditions and the same complex task performed under no planning conditions, and comparing it to the mean difference between a simple (Here-and-Now) task performed under planning conditions and the same simple task performed under no planning conditions. Fluency will show a higher mean difference between complex tasks than between simple tasks. Structural complexity will display a higher mean difference between complex tasks than between simple tasks. Lexical complexity and accuracy will show no significant mean differences between the two levels of Task Complexity.

This hypothesis relates to findings that indicate that more complex tasks may benefit more from planning time. Foster and Skehan (1996; Skehan & Foster, 1997) suggested that more cognitively demanding tasks (e.g. narrative or decision-making) made greater gains than simple tasks (personal information-gap), especially regarding fluency and complexity. In her 1999 study, Ortega also suggested that more cognitively complex tasks should benefit more from planning time. In this case the There-and-Then task is the more complex version because of displaced, past time reference, and should therefore show the greatest gains due to the effects of planning time.

### 4.5.4 Hypothesis 4: Effects of manipulating +/- Here-and-Now on planned and unplanned tasks

**Hypothesis 4**: The effects of increasing complexity along the +/- Here-and-Now variable on production will be enhanced by planning time.

**Hypothesis 4:** I hypothesize that the effect of increasing complexity along the +/- Here-and-Now variable will be stronger on planned tasks than on unplanned tasks. This will be done by calculating the mean difference between a simple (Here-and-Now) task and a complex (There-and-Then) task under planned conditions, and comparing it with the mean difference between simple (Here-and-Now) task and a complex (There-and-Then) task performed under unplanned conditions. The mean difference regarding fluency between planned tasks will be higher than between unplanned tasks. Complexity, both structural and lexical, will be higher for planned tasks. The mean difference for accuracy will also be higher for planned tasks than for unplanned ones.

Robinson (1995a) and Rahimpour (1997) showed that fluency is lower in There-and-Then tasks, a difference which should be theoretically enhanced by planning time. Similarly, the higher structural and lexical complexity predicted for tasks in the There-and-Then should be even greater when planning time is available. Accuracy should also show greater gains when the task is performed under planned conditions.

### 4.5.5 Further questions

In addition to the questions and hypotheses laid out so far, the experiment will try to answer two further questions. Firstly, the experiment measures, analyzes, and interprets the effect of increasing complexity on the subjective perception of difficulty, stress, confidence, interest, and motivation of students. An affective variables questionnaire (see Appendix I) based on Robinson (2001a) is used to measure the impact of the five variables, the validity of which is reinforced by protocol analysis of the questionnaire (see Appendix J). Secondly, the experiment also provides a qualitative analysis of the effects of sequencing on production. As will be described in Section 5.2., a Latin square design is used in order to counterbalance any differences caused by sequence in production. Although it is predicted that no significant differences will be found, the aim will be to check for any patterns of behavior of condition within each sequence.

### 4.5.6 Summary of hypotheses

| | |
|---|---|
| **Hypothesis 1** | Planned task → + fluent + structural complexity = lexical complexity = accuracy [9]<br><br>Unplanned task → - fluent - structural complexity = lexical complexity = accuracy |
| **Hypothesis 2** | Here-and-Now → + fluency - structural complexity - lexical complexity – accuracy<br><br>There-and-Then → - fluency + structural complexity + lexical complexity + accuracy |
| **Hypothesis 3** | The effect of increasing complexity along planning time will be stronger on complex (There-and-Then) versions of the task than on simple ones (Here-and-Now).<br><br>(-planning time, There-and-Then) – (+planning time, There-and-Then) > (-planning time, Here-and-Now) – (+planning time, Here-and-Now)<br><br>+ fluency<br>+ structural complexity<br>= lexical complexity<br>= accuracy<br><br>- fluency<br>+ structural complexity<br>= lexical complexity<br>= accuracy |
| **Hypothesis 4** | The effect of increasing complexity along the Here-and-Now variable will be stronger on planned tasks.<br><br>(Here-and-Now, + planning time) – (There-and-Then, + planning time) > (Here-and-Now, -planning time) – (There-and-Then, - planning time)<br><br>+ fluency<br>+ structural complexity<br>+ lexical complexity<br>+ accuracy<br><br>- fluency<br>- structural complexity<br>- lexical complexity<br>- accuracy |

*Figure 14*. Summary of hypotheses.

[9] " = " means that "no significant differences" are expected.

## 4.6 Summary of Chapter IV

The findings of both planning time and +/- Here-and-Now studies have been reviewed. All planning studies have shown that reducing tasks demands by increasing pre-task planning has beneficial effects for fluency. Lexical complexity has also been shown to significantly increase with extensive pre-task planning time. Structural complexity and accuracy have presented somewhat more mixed results. Some studies have shown significant gains in structural complexity when sufficient time for pre-task planning has been provided, whereas others have shown no significant gains in this dimension of production. Finally, accuracy has presented the least conclusive results of all the areas of production. While some researchers have provided evidence of the positive impact of increased pre-task planning time on accuracy, others have not been able to provide evidence in this direction. Regarding the interaction of the three dimensions during performance, although all studies agree that the amount of information that can be stored in WM is limited, there are at least three different explanations about how fluency, complexity, and accuracy interact. It has been suggested by some researchers that the reason for such behavior is to be found in the fact that accuracy and complexity are in competition for attention during performance. Other researchers, however, do not support the idea of limited attentional capacity and suggest that accuracy and complexity can be attended to simultaneously during performance. Researchers defending a third position have suggested that it is fluency and accuracy which are in competition for

attention. Based on the findings of these studies, the questions that this study aims at answering have been laid out, and a number of hypotheses about the effects of Task Complexity on production have been advanced.

The experiment described in the next chapter, Chapter V, will attempt to provide further evidence about what happens to performance when narrative tasks are made increasingly complex along the two variables described in this chapter, that is, planning time and +/- Here-and-Now.