Effects of the Sequence of Task Complexity in Different Modalities on the Learning of the English Past Tense

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This study examines the effects of the sequence of increasing task complexity in different modalities on the learning of the English past tense of Korean secondary learners. Robinson’s (2007) Cognition Hypothesis argued that learners pay more attention to grammatical forms in complex tasks than in less complex tasks. He suggested that tasks should be sequenced in such a way that resource-dispersing dimensions are first increased in complexity followed by an increase in the complexity of resource-directing dimensions. However, little empirical research has been done on how tasks are sequenced according to their cognitive complexity and how task modality affects second language development in the sequence. Fifty-four learners were divided into an integrated (writing with oral interaction) task group (EG 1), an oral-only task group (EG 2) and a comparison group (CG). After the sequence of six tasks was completed, one-way ANOVA revealed the EGs outperformed the CG significantly on the posttest. The mean score of EG 1 was the highest, while the improvement rate of EG 2 was the highest among the three groups. It is hoped that this result will contribute to building a solid basis on which practitioners can make decisions about sequencing tasks and implementing task modality.

I. INTRODUCTION

For decades, researchers have investigated how to design and sequence tasks in order to facilitate second language (L2) learning. Among the studies on tasks, the cognitive complexity of task has been one of the major concerns because it is believed to affect language acquisition processes. Robinson (2005) predicted that students are more likely to pay attention to grammatical forms in complex tasks than in less complex tasks. He also argued that L2 development could be promoted when the tasks are sequenced properly along the cognitive complexity (Robinson & Ellis, 2008). Nonetheless, most task
complexity research has focused on comparisons between the effects of less complex tasks and those of complex tasks and the joint effect of complex and less complex tasks has been seldom investigated. The effect of sequencing tasks on Second Language Acquisition (SLA) is an open question and how teachers should sequence tasks according to their cognitive complexity in their classes is worth investigating.

It is also important to note that task modality may play an important role in second language task performances and L2 development. Recently some studies (e.g., Adams, 2005) have started to investigate the possible effects of oral and writing tasks and found that integrated tasks (writing with oral interaction) seem to have greater facilitative effect on learning than oral-only tasks. Other than that, relatively little empirical research has been carried out to examine the role of task modality. Therefore, further investigation needs to be conducted to determine whether task modality causes differentiation in L2 learning and development.

Based on the above arguments, this study aims to explore how the sequence of increasing task complexity mediates the efficacy of learning in both integrated and oral-only modes. These are currently unattested empirical questions in SLA, as few researchers have explored the effect of sequenced tasks along the provision of different task modalities. There also has been little research on the compound effect of resource-dispersing and resource-directing dimensions in task complexity. By investigating these questions, the present study provides an understanding of the principles of sequencing tasks and practical implications for teachers to apply in English classrooms. This study will also be able to initiate further studies on the different effects of task modalities and the design of task-based syllabus.

The following specific research questions guide the current study:

1. Does the sequence of increasing task complexity have an effect on the learning of a grammatical form?
2. If the sequence of increasing task complexity has an effect on the learning of the grammatical form, is the effect different depending on the task modality?

II. LITERATURE REVIEW

1. Task Complexity

In SLA, the notion that tasks play an important role in facilitating learners’ acquisition of a second language is generally accepted. Skehan and Foster (2001) defined language tasks as activities in which the communication of meaning is primary and argued that the focus of a task is the use of language to accomplish a specific goal. Because task-based
approaches have sought to create an environment for these implicit and incidental learning, it is worth implementing task-based learning in English as a Foreign Language (EFL) settings where the chances of meaningful use of L2 are limited.

Among various aspects of L2 tasks, how attention is deployed during task performances in terms of the complexity of the tasks has been one of the important issues for L2 researchers. There have been two major models concerning the cognitive approach to task complexity: Skehan and Foster's Limited Attentional Capacity Model (Skehan & Foster, 2001) and Robinson's Triadic Componental Framework, also known as the Cognition Hypothesis (Robinson, 2001, 2005, 2007). The former model assumes that attentional resources are limited and that increasing the complexity of tasks reduces the pool of generally available attentional capacity. As learners' attentional limits are reached, L2 learners will prioritize processing meaning over processing language form. As a consequence, it predicts that an increase in cognitive task complexity results in a decrease of the complexity and accuracy of the linguistic output. The latter model of task complexity is supported by the Triadic Componental Framework on which the present study is based. Previous studies (e.g., Gilabert, 2007: Robinson, Caderno, & Shirai, 2009) also tend to give a support to this model. In this model, humans possess multiple, non-competitive pools of attention. Robinson (2001) argued that increasing the cognitive demands of tasks increasingly engages cognitive resources, leading to the paying of more attention to task input in working memory.

Based on the distinction of the attentional resource pool, the Cognition Hypothesis claims that increasing the cognitive demands of tasks along certain dimensions will: (a) push learners to greater accuracy and complexity of L2 production in order to meet the greater functional and conceptual communicative demands they place on the learner; (b) promote interaction and heighten attention to input, thereby increasing learning from the input and the incorporation of forms made salient in the input; and (c) promote longer-term retention of input. Therefore, (d) performing the sequence of less complex to complex tasks will also lead to automaticity and efficient scheduling of the components of complex tasks (Robinson & Gilabert, 2007). Among these functions of increasing task complexity, the last function was under empirical investigation in this study.

In order to manipulate tasks, Robinson (2005, 2007) also describes task complexity as consisting of two categories, resource-directing and resource-dispersing dimensions. The list of pedagogic task features in the two dimensions is shown in Table 1. The former directs learners' attention to specific and task-relevant features of the language code within the same resource pool. That is, the demands on language use made by increases in task complexity, and the increased conceptual demands they implicate, can be met by specific aspects of the linguistic system (Robinson, 2005). On the other hand, the latter disperses attention over many nonspecific areas of the L2. In other words, complex tasks along
resource-dispersing dimensions do not direct resources to the features of language code.

TABLE 1

<table>
<thead>
<tr>
<th>Task Complexity Dimensions (Adapted from Revesz, 2007)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource-directing variables making cognitive demands</td>
</tr>
<tr>
<td>+/- here and now</td>
</tr>
<tr>
<td>+/- few elements</td>
</tr>
<tr>
<td>+/- reasoning</td>
</tr>
</tbody>
</table>

As shown in Table 1, increasing task complexity along resource-dispersing dimensions such as [ +/- planning time] will disperse attentional and memory resources (Nuevo, 2006). Also, resource-directing factor such as [ +/- here and now] may redirect linguistic resources through the use of past time reference and deictic expressions to meet the more complex [- here and now] condition (Nuevo, 2006). These two dimensions of tasks are where the Cognition Hypothesis differs from the Limited Capacity model, which argues increasing task complexity in any dimension degrades task performance. In the Cognition Hypothesis, the increase of task complexity along resource-dispersing dimensions results in the decrease of the accuracy and complexity of task performance, as the Limited Capacity Model predicted. However, the Cognition Hypothesis claimed that the increase of task complexity along resource-directing dimensions has a beneficial effect on the task performance, which does not accord with the view of the Limited Capacity model.

These dimensions of task complexity have also been defined as task sequencing criteria. Using these dimensions, Robinson (2010) suggested two principles of task sequencing (Table 2).

TABLE 2

<table>
<thead>
<tr>
<th>Principles of Task Sequencing (Adapted from Robinson, 2010)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Principle 1</strong> - Only the cognitive demands of tasks contributing to their intrinsic conceptual and cognitive processing complexity are sequenced.</td>
</tr>
<tr>
<td><strong>Principle 2</strong> - Increase resource-dispersing dimensions of complexity first (e.g., from + to – planning time), and then increase resource-directing dimensions (e.g., from – to + intentional reasoning).</td>
</tr>
</tbody>
</table>

Based on these two principles, Robinson (2010) presented the SSARC model. In the model, task performance first draws on the ‘simple and stable (SS)’ current interlanguage, and then resource-dispersing dimension is increased, which promotes ‘automatization (A)’. The increase in the resource-directing dimension promotes ‘restructuring (R)’, and the maximum ‘complexity (C)’ destabilizes the current interlanguage system. That is, the sequenced tasks destabilize the existing interlanguage system and lead learners to automatize and incorporate new language forms into their interlanguage system. Until
recently few empirical researches have empirically demonstrated this model and this study adapts a part of this model to prioritize the chances to learn the English past tense.

2. Previous Research on Task Complexity

Over the past few decades, researchers have been interested in investigating factors affecting task effects on SLA. They have mostly examined the effects of manipulating dimensions of task complexity on the accuracy, fluency and complexity of L2 speech production (e.g., Robinson & Gilabert, 2007). Since previous studies on the [+-planning time] condition and the [+- here and now] condition are crucial to the present study, the results of these studies are summarized here. First, the [+ planning time] condition has generally shown beneficial effects for fluency and complexity of learner production. However, mixed results were found for accuracy. Ellis (1987) studied how planned discourse affected learners’ written and oral performance and showed that accuracy in the irregular past forms was not affected by the different levels of planning while rule-based language such as the regular past ‘-ed’ was somewhat influenced by planning.

Next, there have not been many studies on the [+- here and now] condition. The [-here and now] condition is considered to be more demanding than the [+ here and now] condition. Robinson (1995) found that the [-here and now] condition facilitated more accurate speech and more lexical complexity than the [+ here and now] condition. Iwashita, McNamara, and Elder (2001) studied the effect of the [+-immediacy] condition, that is, the [+-here and now] condition, and found that the [-immediacy] condition which is the more difficult version of tasks and similar to [-here and now], triggered higher levels of accuracy. Even though it seems that the [-here and now] condition has positive effect on the accuracy of learner production, there have not been any studies on the accumulated effects of the [+/-planning time] and [+-here and now] condition on L2 learning.

In terms of task complexity’s effects on interaction, Youjin Kim (2009) investigated the impact of task complexity on the occurrence of language-related episodes (LREs) during task-based interaction in two task types (i.e., picture narration and picture difference tasks). The results indicated that the effects of task complexity on the occurrence of learning opportunities differed depending on task types and learner proficiency. On the other hand, with the exception of Nuevo’s (2006) and Revesz’ (2007) study, few studies have aimed to examine how task features can assist L2 development.

Nuevo (2006) investigated whether task complexity operationalized through reasoning demands influences the presence of L2 learning opportunities and L2 developmental
outcomes. The effects of task complexity on development of the English past tense and locative prepositions were measured through oral tasks and grammaticality judgment tests, for which Nuevo found no effects of task complexity on L2 development of past tense morphology. She suggested two reasons; first, she failed to control learners' individual differences which affect task-based production (Robinson, 2005). Second, the context of learner-learner interaction may have been insufficient because a learner may not have the linguistic knowledge required to provide feedback to a fellow learner. Although the results did not establish a direct link between task complexity and L2 development, learners who performed complex tasks made learning gains.

Revesz’ (2007) study examined the separate and joint effects of the [+/- contextual support] condition in the resource-dispersing dimension and the recast on L2 morphosyntactic development with learner-learner interaction. The linguistic target was the English past progressive form. One of her main findings was that learners who received recasts but did not view photos, in the [- contextual support] condition, outperformed learners who received recasts while viewing photos, in the [+ contextual support] condition. That is, increasing task complexity in the resource-dispersing dimension had a facilitative effect with the provision of recasts. Other than that, relatively little empirical research has been carried out to investigate the effects of task complexity on L2 learning.

Moreover, there have been few studies which have explored the sequence of increasing task complexity. Previous studies with the exception of Robinson (2001) mostly have compared the less complex version and the complex version. Robinson, however, compared the effect of the sequence which was from the less complex version to the complex version versus the reverse sequence. In his study, learners’ oral production was assessed for accuracy, fluency, and complexity. The results presented sequencing tasks from complex to simple led to increase in fluency of speaker production, while sequencing from simple to complex led to increase in accuracy which was measured by the number of error free C-units. He explained that performing simple version first led to more efficient and economical speech, which in turns, made more attention available for focusing on accuracy of production. Even in this study, however, the effect of task sequence on a specific grammatical feature was not investigated.

In task-based classrooms, learners are not given one single task, but a series of tasks during the course of a semester. Therefore there should be criteria on which teachers and practitioners rely when they plan a series of tasks. The current study aims to examine the effect of the sequence of increasing task complexity on L2 development and help learners to develop their interlanguage system through the changes of task complexity.
3. Task Modality

Task modality was once considered as a factor relating to task difficulty. Based on Candlin's (1987) proposals, Skehan (1996) distinguished three factors which contribute to the difficulty of tasks. They are code complexity, cognitive complexity and communicative stress (Robinson, 2001). Communicative stress includes the modality of task performance. However, the taxonomies of tasks often include both oral and written activities. The study of Bygate, Skehan and Swain (2001), and that of Ellis (2003) pointed out that most task activities have been directed at oral skills. It has rarely been studied whether the inclusion of a written component changes the nature of the task and influences the learning of forms.

Among very few studies on task modality, two studies showed that the inclusion of writing tasks had positive effects on L2 learning. Yeob Kim (2008) compared the effectiveness of integrated instruction (oral interaction plus writing) versus oral-only instruction for developing the oral language skills of young ESL students. The participants were two beginner-level ESL students enrolled in kindergarten. The results revealed that integrated language-based intervention led to greater gains in oral language development than did exclusively oral language-based intervention. On the basis of the results, Kim suggested that reading and writing can play a positive role in the development of oral language for lower elementary ESL students.

Adams (2005) tested task modality as the task characteristic that may affect learner attention to form to determine whether it influences learners' tendency to focus on second language form. The study showed that task modality played a role in influencing learner orientation to form and concluded that engagement in collaborative writing as well as oral interaction may increase the likelihood of learners focusing on form. Adams (2004) noted that while it is possible for learners to focus on form in both writing and oral interaction, communicative pressure in oral discourse may make it more difficult for learners to step away from the flow of meaning and pay attention to form. In writing, on the other hand, once ideas are down on paper, learners can orient themselves to the targetlikeness of their output during and after the writing process.

A study recently analyzed the effects of the independent variables of task complexity and modality on L2 development. In Baralt's (2010) study, learners performed the task with the researcher in either the face-to-face (FTF) or computer-mediated-communication (CMC) mode. Baralt hypothesized that CMC chat could have greater potential to promote learning due to the very fact that the "conversation" is written, is slower, and allows learners to review their output (Chapelle, 1998). The results presented, however, that the [+ complex] task resulted in the highest improvement in the FTF mode, but hardly any development in the CMC mode and the [- complex] task in the CMC mode led to the
highest amount of development. When teachers lead learners to perform a task, they ought to make a decision on whether to make learners perform the task in the spoken mode or the written mode during the tasks. Because only a few studies have been carried out on task modality’s effects, especially on the joint effects of the cognitive complexity and modality of tasks and they have yielded ambiguous results, it is necessary to look at the role of task modality in influencing L2 learning.

III. METHODOLOGY

1. Operationalization of Task Complexity

The task complexity was operationalized along variables of Robinson's Cognition Hypothesis in this study: the [+- here and now] condition posed as a resource-directing dimension and the [+- planning time] condition posed as a resource-dispersing dimension. First, the former condition has been used to elicit verbs in the past tense which is the target form in this study. Robinson and Gilabert (2007) defined [+ here and now] as a task which requires reference to events happening now, in a mutually shared context, while [- here and now] is defined as a task which refers to events that occurred in the past, elsewhere. Robinson (1995) pointed out that a key factor distinguishing [+- here and now] is whether a shared context is available or not during the task. That is, allowing learners to view a picture strip while narrating in the [+ here and now] condition provides a shared context. On the other hand, the context is not available in the [- here and now] condition if the picture strip is not visible to learners. Therefore, in previous studies (e.g., Gilabert, 2007), as in this study, the learners were not allowed to view their picture strip in the [- here and now] condition. The learners were expected to use past tense verbs consequently as they transitioned from the [+ here and now] condition to the [- here and now] condition.

Second, the [+- planning time] condition was posed as a resource-dispersing dimension. Foster and Skehan (1999) observed that more linguistically complex language appeared when strategic planning was conducted individually rather than in groups. Nuevo (2006) summarized, however, that there seem to be strong effects of [+- planning time] for fluency, somewhat strong effects for complexity, and the least strong effects for accuracy. Since the effect of [+- planning time] on accuracy is still in question, this study operationalized the individual [+- planning time] condition in the sequence of increasing task complexity. The task sequencing in this study is shown in Table 3.
TABLE 3
Task Sequencing Matrix (Adapted from Robinson, 2007)

<table>
<thead>
<tr>
<th>3</th>
<th>- here and now</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>- planning time</td>
</tr>
<tr>
<td></td>
<td>High performative and high developmental complexity</td>
</tr>
<tr>
<td>1</td>
<td>Low performative and low developmental complexity</td>
</tr>
<tr>
<td>2</td>
<td>+ here and now</td>
</tr>
<tr>
<td></td>
<td>- planning time</td>
</tr>
<tr>
<td></td>
<td>High performative and high developmental complexity</td>
</tr>
</tbody>
</table>

2. Participants

The participants were fifty-four Korean students who were 14 or 15 years old and living in Seoul. The learners who received perfect scores on the pretest were excluded from the experiment because they seemed to have acquired knowledge of the past tense from past personal English learning experiences. All of the participants have studied English for a minimum of six years. They received explicit instruction on the past tense two years ago as it is included in the syllabus for 12-year-old students.

The participants were divided into two experimental groups (EGs) and a comparison group (CG). Eighteen learners were assigned to the integrated task group (EG 1) and another eighteen learners were assigned to the oral-only task group (EG 2). Learners in the experiment groups completed a pretest and posttest and carried out six sequenced tasks for about four months. The group which performed tasks in the integrated way wrote stories from picture strips along with oral interaction while the group which performed oral-only tasks performed monologic narration to their partners along with oral interaction. The learners in the comparison group completed the pretest and posttest and experienced implicit learning of the past tense through input-based classes.

To test the pre-treatment equivalence of the three groups in their knowledge of the English past tense, the target form of the present study, the grammaticality judgment test as the pretest was conducted. Table 4 shows that EG 2 had the lowest mean scores.

TABLE 4
Descriptive Statistics for the Grammaticality Judgment Test Scores in the Pretest

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated (EG 1)</td>
<td>18</td>
<td>7.44</td>
<td>2.229</td>
</tr>
<tr>
<td>Oral-only (EG 2)</td>
<td>18</td>
<td>6.33</td>
<td>3.481</td>
</tr>
<tr>
<td>Comparison (CG)</td>
<td>18</td>
<td>7.39</td>
<td>3.127</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>7.06</td>
<td>2.981</td>
</tr>
</tbody>
</table>
To test whether these differences of mean scores and standard deviations had statistical significance, one-way ANOVA was conducted. The results revealed that there was no significant difference in group means on the pretest (p=0.460).

3. Target Grammar and Task Materials

The target form was the English past tense. Although English learners usually learn the past tense early on, the incorrect use of the past tense consistently emerges. The results of the pretest in Table 3 suggested that the English past tense was not completely new to the participants, but they still did not use it accurately. These emergences of the incorrect target form may indicate a certain readiness to learn the form. With regard to the relationship between the English past tense and task complexity, while Nuevo (2006) found no effect of task complexity on the development of the English past tense, Robinson et al. (2009) found that there is more developmentally advanced use of tense-aspect morphology in more complex tasks compared with less complex tasks. Since the resource-directing dimension of the task complexity is operationalized as [+/- here and now] which might direct learners’ attention to tense-aspect morphology, the use of the past tense is expected to be improved by performing complex tasks.

As for task materials, picture description tasks were used in this study and the pictures were from commercial ESL resource books (Huizenga & Huizenga, 2000). In order to elicit the past tense in obligatory contexts, pictures which depicted true stories which had happened in the past were used. Different sets of picture stories were used for every treatment session. Each of the stories was composed of eight strips of pictures which depicted a happening or a story. They provided opportunities for meaningful communication since the learners needed to understand the whole story.

The date of each event was provided on the worksheet to make it clear that it happened in the past (see Appendix A). Except the dates below each picture, the learners did not receive any explicit information about the past tense use from the materials. Instead, the interactions between partners were encouraged by the researcher. Revesz (2007) pointed that tasks in the form of pair or group work could provide chances to present proper authentic L2 samples to learners. In this study learners were expected to learn only from the learner-learner interaction.

4. Procedure

The learners in the EGs completed most of the tasks with different partners from the same group. A pair of learners were seated beside each other, but were asked to hold their pictures at an angle so their pictures could not be seen by the other learner. One learner
was given the first four of the eight pictures and the partner was given the last four of the eight pictures. The learners who held the first four pictures were requested to tell their partner the story their four pictures depicted. Then the learners who held the last four pictures told the story their four pictures depicted to their partners. After listening to their partners’ picture description, the learners were able to understand the whole story which the strip of eight pictures depicted without seeing half of the strip, which their partners held.

The difference between integrated tasks and oral-only tasks emerges after the spoken interaction mentioned above. The learners in the oral-only group performed a monologic narrative task which required that each group member cover the whole story depicted by the strip of eight pictures. Instead of completing the monologic narrative task, each learner in the integrated group wrote the whole story on the worksheet individually. They were requested to tell or write the story from the first picture to the last picture based on what they had heard from their partners.

The study used a pretest-posttest design to explore the effect of the sequence of increasing task complexity on past tense development. The pretest was conducted one week before the first treatment session, and the posttest was conducted one week after all of the treatment sessions had been completed. Table 5 represents the procedure of the six treatments.

<table>
<thead>
<tr>
<th>TABLE 5</th>
<th>The Procedure of the Treatment</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Experimental group (EG) N=36</td>
</tr>
<tr>
<td></td>
<td>Integrated (EG 1) N=18</td>
</tr>
<tr>
<td>Treatment 1</td>
<td>+ planning time</td>
</tr>
<tr>
<td></td>
<td>+ here-and-now</td>
</tr>
<tr>
<td>Treatment 2</td>
<td>- planning time</td>
</tr>
<tr>
<td></td>
<td>+ here-and-now</td>
</tr>
<tr>
<td>Treatment 3</td>
<td>- planning time</td>
</tr>
<tr>
<td></td>
<td>+ here-and-now</td>
</tr>
<tr>
<td>Treatment 4</td>
<td>+ planning time</td>
</tr>
<tr>
<td></td>
<td>- here-and-now</td>
</tr>
<tr>
<td>Treatment 5</td>
<td>- planning time</td>
</tr>
<tr>
<td></td>
<td>- here-and-now</td>
</tr>
<tr>
<td>Treatment 6</td>
<td>- planning time</td>
</tr>
<tr>
<td></td>
<td>- here-and-now</td>
</tr>
</tbody>
</table>

The learners in the EGs participated in six treatment sessions, experiencing the changes of task complexity. In treatments 1 and 4, the [+ planning time] condition was provided. That is, 5 minutes of planning time were given to the learners before they started to tell the
story to their partners by looking at their half of the strips. According to the Cognition Hypothesis, the individual [+ planning time] condition is a resource-dispersing variable which enhances control of an already established interlanguage system. It should be provided before the oral interaction between partners with whom the learners negotiate meaning. It is because the negotiation of meaning might provide input directing the learner's attention to the linguistic demands the task requires, facilitating interlanguage development. In treatments 1, 2 and 3, the [+ here and now] condition was provided. The learners performed monologic narration tasks in the EG2 and writing tasks in the EG 1 while they were looking at the strip of eight pictures. In treatments 4, 5, and 6, however, the [- here and now] condition was provided. The learners turned the strips over so that they could not see the pictures during the monologic narration in the EG 2 and writing tasks in the EG 1.

Treatments 2 and 3 had the same complexity conditions in which the [- planning time] condition and the [+ here and now] condition were provided. Treatments 5 and 6 had the same complexity conditions in which the [- planning time] condition and the [- here and now] condition were provided. From intact group pilot studies, it had been found that the high performative load which was provided in the [- planning time] condition was too burdensome for learners to perform the given task properly on the first attempt. It was because the learners were rarely accustomed to telling stories and building sentences without their teachers' help. By providing the learners with two opportunities to perform complex tasks of the same level, it was expected that the learners would feel confident enough to perform the tasks even with the [- planning time] condition.

Even though the researcher encouraged the learners to use English during their interactions, the learners sometimes interacted with each other in Korean because they did not know the metalinguistic words suitable for the context, especially when they wanted to use words to describe grammatical forms such as 'past tense' or 'suffixes'.

5. Testing Instruments and Analysis

In order to measure the effect of task complexity, many studies have used general measures of accuracy, complexity and fluency of learners' production (e.g., Robinson & Gilabert, 2007). However, the Cognition Hypothesis claims that specific measures of language use should be used depending on the dimensions of conceptual/communicative demand (Robinson et al., 2009). This claim matches the concept-oriented analyses of SLA data that are interested in the linguistic devices that speakers use to express a particular concept (Bardovi-Harlig, 2007). For example, complex tasks requiring temporal reference should promote the use of more developmentally advanced L2 tense and aspectual encoding (Robinson et al., 2009). Robinson and Ellis (2008) also argued that specific
conceptual–linguistic units of analysis are most appropriate to capturing the effects of tasks made complex on the different resource-directing dimensions of complexity. Since the present study operationalized the \([+/-\text{ here and now}]\) condition as the resource-directing dimension of task complexity, which requires temporal reference, it is expected that learners gradually map the concept of the past tense into the appropriate linguistic category while moving from the \([+\text{ here and now}]\) condition to the \([-\text{ here and now}]\) condition. Therefore, the specific measures for assessing learners' English past tense development were adopted in the study.

A grammaticality judgment test was performed as a pretest and a posttest to examine learners’ English past tense knowledge. The test required the learners to write T (true) or F (false) beside every sentence in the test. They were told to underline the part of the sentence they thought to be incorrect and correct it. Each test was composed of seventeen sentences, among which five sentences were distracters. Each test included twelve sentences containing target structure: six of the twelve sentences were target-like and the other six were non-target-like (see Appendix B).

The pretest and posttest were piloted on a comparable group of 14 and 15 year-old students. They first took the pretest and one month later, the same learners took the posttest. A one-month interval seemed to be sufficient to counteract any possible practice effects. The result of the correlational analysis between the two tests yielded the Pearson’s r of .820 \((p=.000)\), which were considered sufficient for parallel forms.

The learners were able to score up to a maximum of twelve points on each test. They were asked to underline the part of the sentence they thought to be incorrect if there was any. If the sentence was considered to be incorrect, the learner's answer was F, if the verb was corrected into the past form, then 1 point was given for the item. If the sentence was incorrect, the learner’s answer was F; however, if the verb was not corrected, then 0 points were given for the item. Any sentence that was judged as being incorrect but for which no correction was supplied was considered to be a wrong answer. The corrections which were done on linguistic forms other than the targeted form were also considered wrong. The statistical analyses were conducted using SPSS 16.0, and the alpha set was .05.

6. Research Hypotheses

The following specific research hypotheses guide the current study:

1) The two experimental groups, which are required to perform the sequence of increasing task complexity, would show greater gains in the posttest than the comparison group, which does not perform the sequence of increasing task complexity.

2) Experimental group 1 (EG 1), which is required to perform integrated tasks, would
show greater improvement in the posttest than the experimental group 2 (EG 2), which performs oral-only tasks.

IV. RESULTS

The grammaticality judgment test was conducted as the posttest to see whether EGs and CG differed with respect to the learning gains. The mean and standard deviation of the posttest scores from the three groups are presented in Table 6.

<table>
<thead>
<tr>
<th>TABLE 6</th>
<th>Descriptive Statistics for the Grammaticality Judgment Test Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Integrated (EG 1)</td>
<td>18</td>
</tr>
<tr>
<td>Oral-only (EG 2)</td>
<td>18</td>
</tr>
<tr>
<td>Comparison (CG)</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
</tr>
</tbody>
</table>

As can be seen in Table 6, EG 1’s mean score was the highest among the three groups and CG’s mean score increased from the pretest only to 7.67 in the posttest. To test whether the differences among the groups were significant or not, one-way ANOVA was conducted, and the results are presented in Table 7.

<table>
<thead>
<tr>
<th>TABLE 7</th>
<th>Summary of One-way ANOVA on Grammaticality Judgment Test Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SS</td>
</tr>
<tr>
<td>Between groups</td>
<td>55.148</td>
</tr>
<tr>
<td>Within groups</td>
<td>313.389</td>
</tr>
<tr>
<td>Total</td>
<td>368.537</td>
</tr>
</tbody>
</table>

As shown in Table 7, the differences among the groups in the grammaticality judgment test were statistically significant (p=.016). In order to determine the source of the differences among the three groups, Tukey HSD test was conducted as post hoc tests. The results of Tukey HSD test on the posttest scores are shown in Table 8.
TABLE 8
Summary of Tukey HSD Test on the Grammaticality Judgment Test Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Group</th>
<th>MD</th>
<th>SE</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tukey HSD</td>
<td>1</td>
<td>2</td>
<td>.167</td>
<td>.826</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>3</td>
<td>2.222*</td>
<td>.826</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>2.056*</td>
<td>.826</td>
</tr>
</tbody>
</table>

The results, as shown in Table 8, revealed that EG 1 (p=.026) and EG 2 (p=.042) outperformed CG significantly on the grammaticality judgment test. That is, both EG 1 and EG 2 had greater gain scores than CG. However, there were no differences between EG 1 and EG 2 on the posttest.

To test whether there were any significant differences in the improvement rate among the three groups, the improvement rate was calculated by subtracting the pretest gain scores from the posttest gain scores. Table 9 reveals the mean and standard deviation of the improvement rate from the three groups.

TABLE 9
Descriptive Statistics for the Improvement Rate

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated (EG 1)</td>
<td>18</td>
<td>2.44</td>
<td>2.382</td>
</tr>
<tr>
<td>Oral-only (EG 2)</td>
<td>18</td>
<td>3.39</td>
<td>2.768</td>
</tr>
<tr>
<td>Comparison (CG)</td>
<td>18</td>
<td>0.28</td>
<td>2.653</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>2.04</td>
<td>2.875</td>
</tr>
</tbody>
</table>

As can be seen in Table 9, the oral-only group showed the highest improvement rate through the sequence of tasks. To test whether the differences among the groups were significant or not, one-way ANOVA was conducted, and the results are presented in Table 10.

TABLE 10
Summary of One-way ANOVA on the Improvement Rate Between the Pretest to the Posttest

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>91.593</td>
<td>2</td>
<td>45.796</td>
<td>6.744</td>
<td>.003</td>
</tr>
<tr>
<td>Within groups</td>
<td>346.333</td>
<td>51</td>
<td>6.791</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>437.926</td>
<td>53</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 10, there were statistically significant differences among the improvement rate from the pretest to the posttest for the three groups on the grammaticality judgment test (p=.03). In order to determine the source of the differences
among the three groups, Tukey HSD test was conducted as post hoc tests. The results of Tukey HSD test on the improvement rate are presented in Table 11.

| Summary of Tukey HSD Test on the Improvement Rate Between the Pretest to Posttest |
|---------------------------------|-------------------|-----------------|---|
| Group      | Group | MD     | SE    | Sig. |
| Tukey HSD  | 1     | -.9444 | .869  | .526 |
|            | 2     |        |       |      |
|            | 1     | 2.167  | .869  | .041 |
|            | 3     |        |       |      |
|            | 2     | 3.111  | .869  | .002 |

The results, as shown in Table 11, revealed EG 1 (p=.041) and EG 2 (p=.002) improved significantly on the grammaticality judgment test. That is, both EG 1 and EG 2 improved more than CG. To allow for easier interpretation of the test results, the improved scores obtained by the three groups from the pretest to the posttest are graphically displayed in Figure 1.

FIGURE 1
The Improvement Rate of the Three Groups from the Pretest to the Posttest

To summarize, the results of the grammaticality judgment test revealed that the sequence of increasing task complexity facilitated the learning of the past tense, the integrated task group had the highest score among the three groups, and the oral-only group showed the highest improvement rate through the sequence of tasks. However, there found no significant differences between EG 1 and EG 2 both on the posttest and the improvement rate from the pretest to the posttest.

V. DISCUSSION

This study examined the effect of the sequence of increasing task complexity on the
learning of the past tense with the provision of two task types. The Cognition Hypothesis predicts that increasing task complexity along the resource-dispersing dimension first and then doing so along the resource-directing dimension promotes L2 learning opportunity (Robinson, 2007). Therefore, the first hypothesis in the present study predicted that the two experiment groups would outperform the comparison group. The empirical findings of this study supported the first hypothesis and showed that the learning of the past tense is facilitated by the sequence of from a [- complex] task to a [+ complex] task in the resource-dispersing and resource-directing dimensions and learner-learner interaction. These findings also showed possibilities of designing developmentally motivated language learning task sequence.

As for the second hypothesis which predicted that the integrated group would show a greater improvement rate than the oral-only group, however, this study did not lend support since both the integrated and oral-only group showed significantly more improvement rate than the comparison group. Moreover, the oral-only group showed a greater improvement rate than the integrated group. There were a few reasons the integrated group did not improve more than the oral-only group. First, the effect of task complexity seems to be somewhat mediated by task modality, especially by writing mode. Treatments 2, 3, 5, and 6 were complex in the resource-dispersing dimension and treatments 4, 5, and 6 were complex in the resource-directing dimension. It may be that performing these complex tasks was not as effective in the integrated mode as in the oral-only mode. In fact, the findings in this study are somewhat in accordance with those in the previous study by Baralt (2010), which compared the effect of FTF interaction with that of CMC interaction. Her study manifested that [+ complex] tasks proved to be effective for oral tasks, while [- complex] tasks produced more successful results in CMC tasks which was performed as “written in” the computer. Concerning the fact that the integrated tasks did not improve learning more than the oral-only tasks in this study, it seems that increasing task complexity might be less effective in the written mode than in the spoken mode.

Second, in the treatment sessions, the integrated group did not seem to focus on the grammatical forms while writing stories. The degree of difficulty of the vocabulary, especially words’ spellings, seemed to be crucial for the integrated group. The LREs during the treatment sessions were largely associated with vocabulary issues, particularly focusing on how to spell words. Youjin Kim (2009) pointed out that the lower group in her study paid attention mostly to word meaning and pronunciation in picture narration tasks, and it showed results which did not support the Cognition Hypothesis. The vocabulary words required by the pictures in the treatment sessions in the present study might be somewhat difficult for learners to write, which might hinder them from focusing on grammatical forms. Considering that Yeob Kim’s (2008) study was carried out with 8-
year-old learners and showed great improvement by the learners in the integrated task, the relationship between learners’ proficiency and the vocabulary required by the tasks could be variables that should be controlled.

Third, the integrated tasks in this study were not as effective as those in Adams (2005) which provided collaborative writing tasks. It is because the writing parts of integrated tasks in this study were performed individually. On the other hand, the learners in the oral-only group listened to their partners’ monologic narrations, and they voluntarily provided the correct forms as shown in Example 1 when their partners could not come up with the right words even though they were not asked for help.

**EXAMPLE 1**

*An LRE by an Oral-only Group Pair*

Learner A : Mother wrote a letter to her. and ... (Silence) ... Uhm...
Learner B : Finally she found her daughter.
Learner A : I see. Finally in 1989, she found her... her daughter.

However, the integrated group did not have chances to provide correct forms as long as they were not asked for help by their partners because they were not required to read their partners’ writing. Only when a learner asked questions, his/her partner provided feedback. Though the researcher encouraged the learners to interact with each other while writing, they were so focused on their own writing that they did not interact with each other as much as the oral-only group did. Even when they felt the gap between what they already knew and what they wanted to write, they did not want to bother their partners. Only a few learners who wanted to use correct forms asked questions to their partners, as shown in Example 2.

**EXAMPLE 2**

*An LRE by an Integrated Group Pair*

Learner C : Here, 'went'?
Learner D : Yes.
Learner C : Past tense? (Spoken in Korean)
Learner D : Yes.

The results point to the importance of considering how an integrated task could help learning of grammatical forms since integrated tasks seem to be effective only when opportunities of appropriate interactions between learners are provided.
VI. CONCLUSION

The present study attempted to test the effect of the sequence of increasing task complexity and task modality on the learning of the English past tense of Korean secondary school learners. The results of the grammaticality judgment test for the integrated, oral-only and comparison groups manifested that both the two experimental groups outperformed the comparison group. This study offers evidence for the Cognition Hypothesis in that the sequence of increasing task complexity facilitates the learning of the English past tense, but this task-based learning process might be mediated by task modality.

This study has pedagogical implications for the use of the sequence of increasing task complexity in English classrooms, suggesting that pedagogically feasible sequencing criteria is necessary. The main premise of task-based learning and teaching is that the interaction and learning is successfully achieved through the use of tasks (Baralt, 2010) and using tasks in the classroom is widely recognized as effective in SLA. While most syllabus were designed based on linguistic forms in the past, Prabhu (1987) suggested that a syllabus could be designed on the tasks which are considered necessary on the basis of the needs analysis of learners. On the other hand, Skehan and Foster (2001) pointed out that if native-like proficiency is the goal of English education, task-based syllabuses need to be augmented, at least at times, by some types of grammar instruction. Therefore, this study is expected to provide a base for setting criteria for grading and sequencing tasks and promoting implicit learning of morphosyntactic features for a task-based syllabus.

This study’s finding with regard to task design and interaction environment is also to be extended to the English classroom. The Cognition Hypothesis suggests that increasing task complexity helps to approximate real world authentic L2 tasks which learners will encounter. Practitioners can use a sequenced order of simple to complex tasks for learners who have chances to use English only in classes in order to provide tasks similar to real life tasks. They should also recognize that sequential tasks may work well in the spoken mode and collaborative writing mode with the provisions of learner-learner interaction. When they aim to incorporate writing mode into their tasks, they should manipulate vocabulary levels in order not to pose a cognitive overload.

This study has several limitations. First, a way for the integrated group to interact with each other more naturally while writing should be devised. Since previous research pointed out that an integrated task is effective in drawing learners' attention to form, the proper combination of meaningful interaction and writing tasks would result in considerable L2 development. Hubert (2008) pointed out that writing allows adult learners to focus his/her explicit attention on different aspects of the target language, including rules of grammar, more than speaking. That is, when adult learners have difficulties in expressing an intended message they may pause their production and seek out language
items which will make the completion of an intended message possible. Therefore, future studies should be carried out on whether the inclusion of a writing component influences the learning of forms.

Second, the results cannot be generalized to different age groups. All the learners in this study were 14-15 years old, and the oral-only tasks might be more effective for them than for adult learners. Weissberg (2000) found that most adult non-natives followed what appears to be a writing-driven process. In other words, only when adult learners grew comfortable enough with face-to-face conversation in English, then speech became more available to them as an arena for syntactic innovation. Future studies might include various age groups to test the relationship between age and task modality.

Third, the findings of this study cannot be generalized to the effect on other grammatical forms. Different grammatical items could result in different results. Since Yuan and Ellis (2003) predicted that the task effect is differentiated by target grammatical forms, there should be future research on task effect on various grammatical forms.

Future studies should also investigate what difficulties learners experience when they perform complex tasks. Baralt (2010) pointed out that cognitive complexity is not something determined by the researcher, but rather by the learner, and how s/he perceives the task. Future studies should ask learners to report their perceived difficulty in order to gain insight into how to sequence tasks.

REFERENCES


### APPENDIX A

**An Example of Task Materials**

◎ The following is a part of a story. Use the words below and tell your partner the story the pictures depicted. (Given in Korean)

![Picture 1](image1)

1965 move to 7 years old

1970 want teacher

1974 tell give up

1977 grow up become
The following is a part of a story. Use the words below and tell your partner the story the pictures depicted. (Given in Korean)

1987/1997 talk about wife
1999 encourage enter
2003 say study
2004 become

APPENDIX B
The Pretest and the Posttest
(The Pretest)

Read the following sentences. For each sentence, you should decide if it is correct or incorrect. If the sentence is correct, write ‘T (true)’. If the sentence is incorrect, write ‘F (false)’ and underline the part of the sentence that is incorrect and correct it. (Given in Korean)

1. Jane makes a cake for me on my last birthday. (   )
2. Has you ever been to Japan and China? (   )
3. Mina went to her grandmother’s birthday party last Saturday. (   )
4. Yesterday Minsu thinks that I was lying when I told him the story. (   )
5. I have a cat who has beautiful eyes and a black tail. (   )
6. She writes an interesting novel ten years ago. (   )
7. My sister used my computer in my room last night. (   )
8. I am afraid of snakes because they are dangerous. (   )
9. Yesterday his younger brother follow him around all day. (   )
10. He entered the university in Canada ten years ago. (   )
11. John goes fishing with his father yesterday. (   )
12. I would like to visit Paris with my family someday. (   )
13. Jennifer lived at her grandmother’s in Jeju ten years ago. (   )
14. Why don’t you go fishing with your family during summer vacation? (   )
15. His teacher talks to his mom about his school work last week. (   )
16. Bill built a small cottage beside a lake last year. (   )
17. Mina’s aunt lives in Japan when she was young. (   )
(The Posttest)

Read the following sentences. For each sentence, you should decide if it is correct or incorrect. If the sentence is correct, write ‘T (true)’. If the sentence is incorrect, write ‘F (false)’ and underline the part of the sentence that is incorrect and correct it. (Given in Korean)

1. My brother is too young not to go to school, so he stays at home. ( )
2. We heard Minsu singing in the bathroom last night. ( )
3. He moves his computer around his room yesterday to find the best spot. ( )
4. It is necessary that he goes to church every Sunday. ( )
5. We go to the post office and sent letters to our family a week ago. ( )
6. People built a tall building in the city center last month. ( )
7. You believed that she was right. ( )
8. He prefers staying at home and watching TV to playing outside. ( )
9. She learned how to draw a portrait in her art class. ( )
10. Last Sunday Michael followed his father around. ( )
11. Are you going to go to the movies this Sunday? ( )
12. She pass the exam and got a new job three years ago. ( )
13. He sees a famous self-portrait in the museum last year. ( )
14. Minsu play soccer with his uncle last Saturday. ( )
15. What do you think it is in front of the building? ( )
16. The teacher go to the art gallery with her student last Saturday. ( )
17. Tom wrote a letter to his mom last Sunday morning. ( )

Applicable levels: secondary
Key words: task complexity, task sequence, task modality, English past tense, integrated task

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