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Effects of Instructional Treatments with Learning Conditions and Tasks on Learning of Simple and Complex Grammatical Rules*

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This study is a subsequent experiment of Ko's (2006), which investigated the effects of learning conditions and task types respectively. Based on the findings of Ko's (2006), the present study examined which combination of instructional treatments combining two learning conditions with two task types could be more effective than the other combinations on the learning of different grammatical rules. 130 Korean college freshmen with low proficiency were assigned to four experimental groups: EC (explicit condition and comprehension task), EP (explicit condition and production task), IC (implicit condition and comprehension task), and IP (implicit condition and production task). After two week instructions, post-test data through grammaticality judgment test and controlled written test were analyzed by the two-way Multiple Analysis of Covariance (MANCOVA). The findings of the study are as follows: (a) for the comprehension of a simple rule, there is no significant difference; (b) for the production of a simple and a complex rule, the EP can be the most effective; and (c) for the comprehension of a complex rule, the EP and the IP can be more effective than the EC and the IC. Overall, the effect of the combination with an explicit condition and a production task is more evident than the others. The results are expected to give empirical evidence and suggestions for more effective ways of promoting learning of formal linguistic features and leading L2 learners to develop their interlanguage.

[learning condition/task type /instructional treatment/rule complexity]

I. INTRODUCTION

In Second Language Acquisition (SLA), the effects of different learning conditions,

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explicit and implicit, have been investigated. Many studies proved to be more positive to an explicit than an implicit condition. Especially, regardless of the rule complexity, an explicit learning condition is also more effective than an implicit condition (Ko, 2006). In Ko's study (2006), different task types, comprehension and production, were examined on which task would be more effective in learning different grammatical rules. The study revealed that the production task could be a more helpful facilitator in learning complex grammatical rules rather than a comprehension task. However, in order to give effective grammar instructions, it seems to be necessary that more research should be conducted as to which combination of different learning conditions with task types could be most effective in learning simple and complex rules, in that grammar instructions in EFL context generally consist of grammar explanations and practice activities. Furthermore, the effectiveness of teaching or learning could be dependent upon the nature of the rules to be taught or learned (DeKeyser, 2003; Izumi, 1999; Robinson, 1996a, 1996b).

Although some research has been done about learning conditions and task types separately, the instructional combinations with different learning conditions and task types have not been addressed, nor how they relate to the grammatical complexity. Thus, it could be necessary to investigate which combination of explicit or implicit learning conditions with a comprehension or a production task could result in a more effective instructional treatment for learning simple and complex grammatical rules.

II. RESEARCH BACKGROUND

1. Implicit and Explicit Learning Conditions in L2

DeKeyser (2003) clarified implicit learning very simply as learning without awareness of what is being learned and explicit learning as learning with awareness, and this present study refers to the explicit and the implicit learning as learning with and without awareness, respectively, based on DeKeyser's definition (2003). With respect to the definition of implicit and explicit instructions as learning conditions, in cognitive psychology the distinction between implicit and explicit learning instructions has traditionally been operationalized by inventing explicit learning conditions where learners are instructed to search for rules underlying the input, and implicit learning conditions in which individuals are instructed to memorize the input (DeKeyser, 1995). In detail, the instruction is considered the treatment to be explicit if rule explanation consisted of the instruction or if learners were directly asked to attend to particular forms and to try to arrive at metalinguistic generalizations on their own. Meanwhile, when neither rule explanation nor instructions to attend to particular forms are not in the instruction, the instruction is

supposed to be implicit. Based on the DeKeyser's view, the present study operationalizes an explicit learning condition as that of rule explanation and an implicit learning condition as a meaning and memorization-based condition.

The SLA field has made some attempts at examining the implicit and explicit issue empirically. Of special interest are the studies by de Graaff (1997), DeKeyser (1995, 1997), Ellis (1993) and Robinson (1995a, 1996a, 1996b, 1997a, 1997b). The studies have demonstrated the advantages of creating explicit learning conditions; that is, conditions which support to help learners become aware of the form of the L2. In order to isolate their independent variables and in order to control for potential extraneous variables, all of these studies have been conducted in laboratory setting when both training and testing were computerized. In addition, de Graaff (1997) and DeKeyser (1995, 1997) focused on the case of learning artificial grammars in the laboratory context.

The implicit and explicit issue has also been investigated in a series of studies conducted by Robinson (1995a, 1996a, 1996b, 1997a, 1997b). Unlike the previous studies, Robinson's studies used a natural language in his experiments. He classified an easy and a hard pedagogical rule of English for the target structures. The target structures for Robinson's (1995a, 1996a) studies were subject-verb inversion in sentences with fronted adverbials (an easy rule) and pseudoclefts of location (a hard rule). Robinson (1995a, 1996a, 1997b) manipulated attention-focusing factors through the creation of four different training conditions: an implicit condition, where participants were told to memorize sentences containing the target structure; an incidental condition, where individuals had to focus on content; a rule search condition, where individuals had to find the rules underlying the input; and an instructed condition, where participants received explicit rule instruction on the target linguistic structure. Results showed that subjects in the instructed condition (explicit-deductive) were significantly more accurate than the rest of subjects in judging the grammaticality of new sentences generated by the easy rules. No significant differences were found between the implicit, incidental and instructed conditions on the hard rule. The studies did not support Krashen (1982) and Reber (1989)'s claim that implicit conditions result in superior learning when the target rule is complex. In short, Robinson's serial studies (1995a, 1996a, 1996b, 1997a, 1997b) have showed that the learners under the most explicit learning condition performed best and fastest, which emphasizes the role of rule awareness.

Meanwhile, two experiments with learners of Spanish as a second language also showed the advantage of learners with rule awareness over other groups. Leow (2000) compared four groups in a designed experiment involving crossword puzzles, using morphological irregularities in the preterit as a target rule and supported the effectiveness of explicit learning and instruction. Rosa and O'Neil (1999) also found that awareness crucially determines the level of intake of a Spanish structure, past counterfactual conditional

sentences. With revealing the effectiveness of explicit instruction, the two studies were also conducted in laboratory settings.

According to Norris and Ortega (2000), only three experiments on the effects of explicit instructions were identified as being conducted in a real classroom setting. It seems to have more benefits for SLA to experiment in a real classroom context rather than in a laboratory setting and thus, more studies on the issue of the effectiveness of explicit conditions are required in a real classroom setting. Besides, most of the studies focused on morphosyntax but the rules focused on in the studies were different in terms of complexity and the results from the studies may be controversial on the effectiveness of explicit instructions in teaching complex rules. Further research appears to be required to directly address the differential effectiveness of implicit and explicit learning on the learning of natural simple and complex grammatical rules in classroom settings.

2. Comprehension and Production Tasks

For this study, a task is a classroom activity which requires that participants comprehend or produce in the second language and which aims at impacting L2 development by raising learners' awareness of particular grammatical features of the language. The task is used as an instructional treatment, not an assessment tool in the study. In this study, tasks are to be understood in the pedagogical sense. They are created as means of promoting language development, as opposed to assessment tasks, which are created to elicit language in order to evaluate the learners' developmental stage.

In examining the psycholinguistic processes of general learning model that captures the process of how learners derive their L2 grammatical knowledge in second language acquisition, there are several conflicting models which emphasize effective tasks for learning L2 grammatical knowledge respectively. One such model is proposed by Gass's integrated model (1988, 1997) and VanPatten's input processing model (1995, 1996), which emphasize comprehension tasks for converting input into intake. The other model emphasizing production tasks for L2 grammatical development is Swain's Output Hypothesis (1985, 1995).

Some empirical studies based on input processing model have been conducted to reveal the effects of input based instructions utilizing elaborate comprehension tasks (Cadierno, 1995; VanPatten & Cadierno, 1993a, 1993b; VanPatten & Oikkenon, 1996; VanPatten & Sanz, 1995). Briefly, processing instruction aims at altering the processing strategies that learners normally use to comprehend input and encouraging them to make better form-meaning connections. This is generally done by (1) explaining to the learners the relationship between the given form and the meaning it conveys; (2) providing them with information about good and poor processing strategies; and most importantly, (3) providing

learners with 'structured input' activities which encourage them, in controlled situation, to pay attention to the relevant grammatical cues so that they can form better form-meaning connections.

The positive effects of processing instruction are reported in Cadierno (1995), VanPatten and Cadierno (1993a), VanPatten and Sanzs (1995) and Yang (2005). These studies included all of the above three instructional features in their instructions. Specifically, the two studies, VanPatten and Cadierno (1993a) and Yang (2005), showed that input-based instruction with comprehension tasks was as effective as output-based instruction with production tasks in production of the target rule. VanPatten and Oikkenon (1996) specifically addressed the question of whether explanation or structured input activities are the causative variables for the positive effects of such instruction. They found that provision of structured input activities alone was as effective as the regular processing instruction which included explanation components.

While processing instruction is effective because it creates a 'pushed input' condition, 'pushed output' can be effective to enhance learning (Swain, 1985, 1995). The importance of learners' output is emphasized based on Swain's Output Hypothesis (1985). Swain's Output Hypothesis was formulated essentially in reaction to Krashen's claim about the major role of comprehensible input in SLA. Swain claims that 'comprehensible input,' while invaluable to the acquisition process, is not enough for learners to fully develop their L2 proficiency. She argues that what the learners need is not only comprehensible input, but 'comprehensible output' if they are to be both fluent and accurate in the target language. The output can promote language acquisition by allowing learners to recognize problems in their interlanguage capabilities. Recognition of problems may occur because of either internal or external feedback and the recognition through output may encourage learners to seek for relevant input with more focused attention (Swain & Lapkin, 1995).

Empirical studies examining the Output Hypothesis have been conducted (DeKeyser, 1997; Izumi, 1999; Izumi & Bigelow, 2000; Izumi, Bigelow, Fujiwara, & Fearnow, 1999; Kim, 2008; Ko, 2006; Pica1988; Swain 1995; Swain & Lapkin 1995). Specifically, Izumi (1998a; 1999) and his colleagues (Izumi & Bigelow, 2000; Izumi, Bigelow, Fujiwara, & Fearnow, 1999) investigated that learners' recognition of their linguistic problems encourage them to notice relevant features if appropriate input is subsequently provided to them. These studies attempted to address the noticing function of output by comparing two groups of ESL students. As for the results, the experimental group was able to incorporate the target form presented in the input in their immediately subsequent production. Greater gains on the tests for the experimental group were found on the first post-test, which supported for the noticing function of output in SLA.

Regarding effective tasks in learning grammatical rules, two conflicting task types, comprehension task based on input processing and production task based on output

hypothesis, could be candidates for capturing learners' attention to input and converting it into intake and noticing the gap between target language and learners' interlanguage. The claims from input processing and output hypothesis for appropriate tasks with more benefits seem to be a controversy and need to be investigated in a more effective way for L2 learners to develop their grammatical competence.

In short, according to the rule complexity, combining a learning condition with a task may result in a more effective grammar instructional treatment. Although previous studies revealed that learning condition, task type, and grammatical rule complexity influence English grammar learning in SLA, there seems to be no research to examine which learning condition fits best into which task type according to the different rule complexity. This study, therefore, will address which combination of different learning conditions with different task types can be more effective than the other instructional treatments in EFL learning of simple and complex grammatical rules. The hypothesis for the question is that there will be a significant difference between the instructional treatments in the learning of a simple and a complex grammatical rule. As for the rationale of the hypothesis, since the effects of an explicit learning condition and a production task have been examined, the instructional treatments with the combination of a certain learning condition and a task will be worth being investigated. Subsequently, the research findings are expected to give pedagogical implications for EFL grammar teaching. The effects of an explicit instruction need to be confirmed as emphasized in the SLA (Norris & Ortega, 2000; Robinson, 1996a, 1996b).

III. METHOD

This investigation is a subsequent study of Ko's (2006), which examined the effects of learning conditions and task types separately. This experiment was treated identically with Ko's (2006). In detail, participants, materials, procedures of the experiment except for the data analysis were the same as her study (2006).

1. Overall Design

The present study includes two independent variables, learning conditions and task types. Two types of learning conditions (an explicit and an implicit condition) and two types of tasks (a comprehension and a production task) are between –subject variables. There are two dependent variables: The scores of the simple rule grammaticality judgment test (GJT)/controlled written test (CWT) and the scores of complex rule GJT/CWT.

The participants in the study were divided into four groups: (a) one group (EC) received

rule explanations (explicit condition) and did a multiple-choice task in the way of a dialogue (comprehension task); (b) another group (EP) had rule explanations (explicit condition) and wrote a sentence with the cue words in the dialogue (production task); (c) a third group (IC) memorized and read for the meaning of the target sentences (implicit condition) and did a multiple-choice task (comprehension task); and (d) the last fourth group (IP) memorized and read for the meaning of the target sentences (implicit condition) and did a writing task (production task). The reason for making memorization and reading for meaning being the constituents of implicit condition was based on the results and claims of Robinson (1996b). The study claims that implicit and incidental learning are alike in not requiring a conscious focus on the grammatical form of the stimuli presented during learning. In the implicit condition the task instructions are simply to remember co-occurring words, whereas in the incidental condition the task instruction is to read for meaning. Robinson (1996b) noted that the two learning conditions had the same patterns in learning and showed the same results of the two learning conditions.

2. Participants

The participants for the experiment were 130 Korean college freshmen (85 males and 45 females) majoring in different subjects, and they were taking TOEIC (Test of English as an International Communication) at a university. The four classes were selected based on the results of a TOEIC exam taken at the beginning of the semester. To identify whether the four classes are homogeneous groups in terms of English proficiency, a one-way analysis of variance (ANOVA) was run on the TOEIC scores of the four classes. The test results of the four classes did not show a significant difference among classes and the students in each class could be assumed to be a homogeneous group (p= 0.424). The mean score was 405.92, which indicated that the participants were considered to be of the same low proficiency level in English. The participants in each class were conveniently assigned to the four experimental groups: EC, EP, IC, and IP group. All the classes were taught by the researcher.

3. Materials

Based on Ko's (2006) study, the target rules, comprehension and production tasks, GJT and CWT are adopted in this present study. Since there have not been objective criteria to identify which grammatical rules are simple or complex, this research chose Robinson's (1996b) six steps to be taken in his study. From the results of rule familiarity and complexity surveys adopted from Robinson (1996b), target rules are adverbial fronting of 'location' as a simple rule and pseudo-cleft clause with a focus on a prepositional phrase as

a complex rule. The structures exemplifying the target rules are presented below:

(a) simple structure: *Into the house ran John.*
(b) complex structure: *Where the cheese is is in the bag not in the basket.*

To give ambient and salient input of the target rules to the participants, the 40 sentences consisted of 5 types and 4 tokens in each of the simple and the complex rule adapted from Robinson (1996b) (Appendix A).

Regarding tasks, comprehension tasks are based on the principle of VanPatten's (1995, 1996), all four answer choices in each multiple choice question had necessary content words for understanding dialogues. Once learners understand the communication with the given content words via semantic information processing, they try to make form-meaning mapping by attending to grammatical forms with high communicative value. The answer choices in the multiple choice questions had the same content words, but the only difference among the answer choices was the order of the words in each choice, which is the key element of the target rules: adverbial fronting of 'location' and pseudo-cleft with a focus on prepositional phrases. While searching for the appropriate forms, learners received feedback which might function as an 'informational content' with high communicative value in the input processing model. Through the feedback, the participants might be able to process the form. An example of a comprehension task is shown below:

A: Did Eric walk out of the bookstore or into the bookstore?
B: _____
A: Was he alone?
① He walked out of the bookstore.
② Walked out of the bookstore he.
③ Out he walked of the bookstore.
④ He out of the bookstore walked Answer: ①

The comprehension task was composed of forty multiple choice questions. The task included five types of simple and complex rules, respectively, and each type of rule was repeated four times. To help the learners process the input for meaning (the first step of input processing), dialogue format was used in the task. The feedback for each question was given by presenting a correct choice number without a rule explanation.

According to the claim by Swain (1995), the production task used in the present study was a written task which might provide opportunities for the participants to produce their interlanguage and realize what they wanted to write and what they could not (noticing function). In addition, written feedback was given to the participants as an interlocutor.

Through the feedback, the participants might have opportunities for the hypothesis-testing and judging linguistic forms of their interlanguage production (function of hypothesis-testing). An example of a production task used in the present study is presented below:

A: Did Eric walk out of the bookstore or into the bookstore?
B: He _____. (the bookstore, out of, walked)
A: Was he alone?
Answer: He walked out of the bookstore.

The production task was made up of forty written tasks. The task included five types of simple and complex rules, respectively, and each type of rule was repeated four times for giving the salient and affluent input. To give the context of the target structures of the participants, the same dialogue format was used as that of the comprehension task, which might validate the comparison of the two different task types. After giving the instruction to complete the sentences, feedback for each of the questions was given in the way of showing correct sentences without rule explanation in order not to invalidate learning conditions.

To assess how participants comprehend rules and whether they can produce the rules, a GJT and a CWT were conducted in Pre-test and Post-test. Each of the two tests has 20 structures: 5 structures exemplifying simple rules, 5 structures exemplifying complex rules, and 10 distracters. The GJT required participants to circle 'grammatical,' 'ungrammatical,' or 'not sure' in response to given sentences. The format of the CWT included an instruction to complete the sentences with the same meaning as those of the given sentences (Appendix B).

4. Procedure

The procedures of the experimental treatments were identical with those of Ko (2006) (Appendix C, D, E). Before the participants were assigned to one of the four experimental groups: EC, EP, IC, and IP, they completed a Pre-test made up of GJT and CWT. The experimental treatments were conducted for two fifty-minute experimental periods over two weeks. All of the four experimental treatments consisted of two sessions, the first session for simple rules and the second session for complex rules. Each session consisted of two phases, a training phase as a learning condition (explicit and implicit conditions) and a task phase (comprehension or production tasks).

The results were analyzed using SPSS (version 12). The data gained through the GJTs and CWTs were submitted to a two-way Multiple Analysis of Covariance (MANCOVA) of the Post-test results. Since the analysis did not secure homogeneity of experimental groups

in the Pre-test, it needed to adjust for initial difference between the groups to assess the effects of the experiment. The MANCOVA was conducted using the Pre-test scores as a covariate. This statistical device was not a repeated measure because the GJT and the CWT, dependent variables, were performed once. The significant level was set at $p < .05$.

IV. RESULTS AND DISCUSSION

The issue of which kind of instructional treatments (manipulating either an explicit or an implicit learning condition with any of the two tasks) is the most effective on the learning of a simple and a complex rule will be investigated.

In order to examine how instructional treatments affected the learning of simple and complex grammatical rules, the effects of instructional treatments were analyzed through the MANCOVA. The scores of the four instructional treatments (EC, EP, IC, and IP) on the simple rule GJT/CWT and the complex rule GJT/CWT were submitted to the MANCOVA. Between-group comparisons were performed through multiple comparison analysis to determine how the groups significantly differ from each other.

1. Instructional Treatments for Simple Rule

As shown in Table 1, the MANCOVA results for comprehending a simple rule did not reveal a significant difference between instructional treatments ($F = .939$, $p = .424$).

TABLE 1
MANCOVA Results of Post-test for Simple Rule GJT by Instructional Treatment

Group	Pre-test		Post-test		Adjusted Mean		*F*	*p*
	Mean	SD	Mean	SD	Mean	SE		
EC(40)	3.05	1.06	4.23	1.09	4.10	.19	.939	.424
EP(38)	2.06	.92	3.97	1.08	4.04	.20		
IC(28)	2.46	1.21	3.57	1.42	3.68	.22		
IP(26)	2.85	1.37	4.23	1.03	4.20	.23		

* adjusted mean of pre-test=2.61

Regarding the effects of instructional treatments on the production of the simple rule, Table 2 shows that there was a significant difference between instructional treatments ($F = 8.085$, $p = .000$). The results suggest that the EP can be more effective than the other instructional treatments in producing the simple rule.

TABLE 2

MANCOVA Results of Post-test for Simple Rule CWT by Instructional Treatment

Group	Pre-test		Post-test		Adjusted Mean		*F*	*p*
	Mean	SD	Mean	SD	Mean	SE		
EC(40)	2.03	1.291	3.78	1.349	3.63	.196	8.085	.000
EP(38)	1.31	1.142	4.11	.979	4.17	.202		
IC(28)	1.18	1.056	2.68	1.219	2.83	.226		
IP(26)	1.50	1.105	4.08	1.164	4.04	.228		

* adjusted mean of pre-test=1.54

For the difference between the instructional treatments on the production of the simple rule, a multiple comparison was performed to identify the significant differences between the four instructional treatments. Table 3 revealed that there were significant differences between the EC and the IC, the EP and the IC, the IP and the IC, the former of each set outperformed the latter. However, there was not statistically significant difference between the scores of the EC, the EP, and the IP.

TABLE 3

Multiple Comparison of Post-test for Simple Rule CWT by Instructional Treatment

	EC	EP	IC	IP
	A	**A**	**B**	**A**
(Adjusted Mean/SE)	3.63/.19	4.17/.20	2.83/.22	4.04/.22

2. Instructional Treatments for Complex Rule

With respect to the effect of instructional treatments on the comprehension of a complex rule, Table 4 shows the MANCOVA results of the Post-test for the complex rule GJT, revealing a significant difference between the instructional treatments (F= 4.056, p = .009). The IP had more of an effect than any other group on the comprehension of a complex rule.

TABLE 4

MANCOVA Results of Post-test for Complex Rule GJT by Instructional Treatment

Group	Pre-test		Post-test		Adjusted Mean		*F*	*p*
	Mean	SD	Mean	SD	Mean	SE		
EC(40)	2.30	.939	4.18	.90	4.08	.18	4.056	.009
EP(38)	1.19	1.03	4.31	1.06	4.32	.19		
IC(28)	1.14	.97	3.50	1.50	3.62	.21		
IP(26)	2.15	1.08	4.65	.89	4.63	.21		

* adjusted mean of pre-test=1.72

The comparison between the instructional treatments in the complex rule GJT was shown in Table 5, which revealed a significant difference between the IP and the EC, the IP and the IC, and the EP and the IC, suggesting that the IP outperformed the EC and the IC, and the EP performed better than IC. There was no significant difference between the scores of the EP and the IP.

TABLE 5
Multiple Comparison of Post-test for Complex Rule GJT by Instructional Treatment

	EC	EP	IC	IP
	A/B	**A/C**	**B**	**C**
(Adjusted Mean/SE)	4.08/.18	4.32/.19	3.62/.21	4.63/.21

As for the effects of the instructional treatments on the production of the complex rule, Table 6 illustrates a statistically significant difference between the instructional treatments (F= 10.509, p= .000). The EP had the highest gains of the four instructional treatments, which could imply that the EP can be the most effective in producing a complex rule.

TABLE 6
MANCOVA Results of Post-test for Complex Rule CWT by Instructional Treatment

Group	Pre-test		Post-test		Adjusted Mean		F	p
	Mean	SD	Mean	SD	Mean	SE		
EC(40)	.50	.71	2.98	1.79	2.83	.28	10.509	.000
EP(38)	.28	.45	3.44	1.66	3.50	.29		
IC(28)	.11	.41	1.07	1.30	1.22	.32		
IP(26)	.50	.76	2.31	1.85	2.27	.32		

* adjusted mean of pre-test= .35

The comparison between the instructional treatments for the production of a complex rule is shown in Table 7, which revealed that there was a statistically significant difference between the EC and the IC, the EP and the IC, the EP and the IP, and the IP and the IC. It could be interpreted that the EC performed better than the IC; the EP performed better than the IC and the IP, and the IP performed better than the IC. There was no significant difference between the EC and the EP even though the EP had a higher adjusted mean score than the EC.

TABLE 7
Multiple Comparison of Post-test for Complex Rule CWT by Instructional Treatment

	EC	EP	IC	IP
	A/C	**A**	**B**	**C**
(Adjusted Mean/SE)	2.83/.28	3.50/.29	1.22/.32	2.27/.32

In sum, the hypothesis reading that there will be a significant difference between instructional treatments on the learning of simple and complex grammatical rules was partially supported. Overall, the EP instructional treatment was more effective than the other instructional treatments; in producing simple and complex rules, the EP was more effective than any other instructional treatment even though there was no differential effect was found in the IP instructional treatment on the comprehension of a complex rule. Accordingly, the results could give answer to the research question: which instructional combination could be more effective in learning different grammatical rules.

The findings from the effects of the instructional treatments were consistent with those from the effects of learning conditions and task types in Ko (2006). Ko (2006) showed that the effects of learning conditions were not statistically different on the comprehension of simple and complex rules whereas the explicit learning condition had more effects on producing simple and complex rules than the implicit learning condition. In addition, she revealed that the effects of task types were statistically different on the learning of different grammatical rules; the production task had more effects on the learning of both the rules.

For the learning of simple rule, the results from the comprehension of a simple rule appear to reject Robinson's findings that the learners of instructed performed simple rules were better than the implicit learners regarding the accuracy of simple rules. Rather, the results may be partially in line with Reber's (1989) claim that the explicit learning of simple rules could be as effective as implicit learning as long as the comprehensive input is salient and well structured. As for the effects of the tasks, the results contradict the idea that linguistic competence acquired through comprehension is available both for comprehension and for production (VanPatten & Cadierno, 1993a), in that there was no evidence that the instructional treatments with a comprehension task (EC and IC) were superior to the instructional treatments with a production task (EP and IP) either in the comprehension or in the production of the different rules. What is more, the results in learning a simple rule through a comprehension and production task do not confirm the DeKeyser's (1997) claim, who hypothesized that the practice effect would be skill-specific in that learners with only production practice would automatize more production skills; that is, performance in comprehension or production appears to be reduced when the other

skill is practiced. Contrary to DeKeyser (1997), both Ko's (2006) and the present results indicate that a production task may be more effective than a comprehension task both in comprehending a complex rule (see Table 5) and in producing a simple and a complex grammatical rule (see Tables 3 and 7).

With respect to the effects of the instructional treatments on the production of the simple rule, the EP was more effective than the other instructional treatments, which might be caused by the main effect of an explicit learning condition (the MANCOVA revealed no significant interaction between learning conditions and task types in any rule GJT or CWT (p= .547)), in that the EP outperformed the IC, and the EC outperformed the IC. The common learning condition in the EC and the EP was an explicit learning condition and the effects of an explicit learning condition were evident on the production of the simple rule. From the multiple comparisons between the instructional treatments (see Table 3), the IP outperformed the IC, which might be caused by the effects of a production task. Consequently, given the results of the outstanding effects of an explicit learning condition and a production task on the production of a simple rule, those effects were transferred to the EP instructional treatment whose combination was an explicit learning condition and a production task.

For the effects on the comprehension of a complex rule, the EP and the IP were more effective of the other instructional treatments (EC and IC), which could lend support to the assumed reason of the production task effect. In Ko's (2006) study, the production task on the comprehension of complex rule was superior to the comprehension task. Consequently, it could be implied that a production task may be more effective than a comprehension task in perceiving a complex rule. The results could also confirm those of Izumi's (1999) study, who found the potentially facilitative effects of text-reconstructing tasks such as a pushed-out task or a production task on the acquisition of the assumed complex rule, English relativization. Both the Izumi's (1999) study and the present study on a complex rule appear to confirm the Swain's Output Hypothesis (1985, 1995). Through a production task as a pushed-output task, learners could have some advantages; learners could detect the formal elements in the input and integrate processing of the target structure and finally notice the mismatches between learners' interlanguage and the target input.

Lastly, as for the effects of instructional treatments on the production of the complex rule, the EP was the most effective of the other instructional treatments. As mentioned previously, an explicit learning condition and a production task were more effective than an implicit learning condition and a comprehension task, respectively (Ko, 2006). Those effects were evident in the EP instructional treatment combining an explicit condition with a production task on the production of complex rules. Hence, the EP performed better than the IC and the IP; the EC performed better than the IC for outstanding effects of an explicit leaning condition (Ko, 2006). In addition, the IP outperformed the IC, which might be

attributed to the strong effect of a production task.

Even though there was no interaction between two main effects of learning conditions and task types in all the cases of learning a simple and a complex rule, it could be implied that the instructional treatment combining an explicit learning condition and a production task (EP) may be more effective on learning grammatical rules, favoring more explicit instructional treatments with production tasks. As was in the case of many studies on the positive effects of explicit instructions (DeKeyser, 1995; Norris & Ortega, 2000; Robinson, 1997a; Rosa, 1999; Rosa & O'Neil, 1999), the development of explicit knowledge is more effective in helping individuals make generalizations to new exemplars of the target structure and change input into intake through a concurrent production task, which was evident in the studies on the Output Hypothesis (Izumi, 1999; Izumi & Bigelow, 2000; Izumi et al., 1999; Kim, 2008).

V. CONCLUSION

With respect to the effects of instructional treatments, the research question discussed which instructional treatment combining either of the learning conditions with any of the two task types was the most effective in learning of a simple and a complex rule. Differential effects between the instructional treatments were hypothesized.

The issue of differential effects among the instructional treatments gave interesting answers. For the comprehension of a simple rule, the adjusted mean scores from all the instructional treatments were not significantly different and suggest that there would be no differential effects on the comprehension of a simple rule. On the contrary, the adjusted mean scores from the production of a simple and a complex rule were significantly different between the treatments, revealing that the scores of the EP were the highest. For the comprehension of a complex rule, the IP and the EP had higher gains than the other treatments. Those significant score differences could suggest that the EP is more effective on the production of both simple and complex rules and the EP and the IP is more effective on the comprehension of a complex rule.

Overall, more positive effects of the EP might be attributed to the effects of an explicit learning condition and a production task, in that the common instructional treatment in the EP and the IP is a production task and an explicit learning condition in the EP and the EC of which the effects were evident in the production of a complex rule. Accordingly, the hypothesis, predicting differential effects of the four instructional treatments, was almost supported. The findings suggest that an instructional treatment may work better if it is accompanied with other forms of assistance, such as a rule presentation and a focused production task. Table 8 displays the summary of the results of the immediate effects of

instructional treatments on the learning of a simple and a complex rule.

TABLE 8

Summary of Results of Post-test by Instructional Treatment

		Instructional Treatment
Simple	GJT	EP = EC = IC = IP
	CWT	EP, IP, EC > IC
Complex	GJT	IP > IC, IP = EP, EP = EC
	CWT	EC > IP > IC, EP = EC

* > more effective statistically, *= as much as effective statistically

Subsequently, those effects of an explicit learning condition and a production task could give pedagogical implications about more advisable instructional treatments: Instructional treatment combining rule explanations with a production task should be more beneficial for teaching simple and complex grammatical rules. According to rule complexity and learners' English proficiency, the proper instructional treatments can be referred to or applied in developing ELT materials for teaching grammatical rules (Kim et al., 2007).

Even though this study focused on the effects of instructional treatments with different learning conditions and tasks and tried to find out robust evidence for the research purpose, there are some limitations. Both the target grammatical rules were about word order; adverbial fronting of location and pseudo-cleft clause with a focus on a prepositional phrase. The word order area in linguistic domains is noticed as an error made repeatedly in EFL context even though EFL teachers repeat rule explanations or drills (Kim & Dammers, 2008). Thus, this two-week research can make it difficult to expect the long term effect of the instructional combination, the EP. In addition, the participants of the study were adults with low proficiency in English, which seems to give a doubt whether the results of the study could be generalized to child EFL learning and the learners with over intermediate proficiencies. As was the case of Reber's (1989) claim that the effect of an implicit learning is more evident in children, the future research needs to be done, which includes advanced language learners and children as well.

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Appendix A

Parts of Training Sentences

Simple Rule Sentences

Simple Grammatical Type 1

Paul drove across the city

Mary sank under the sea.

Jill walked over the bridge.

Simple Grammatical Type 3

Round the track Bill rode.

Through the forest Jane went.

Past the river Helen rode.

Out of the shop Jim rushed.

Simple Grammatical Type 5

Elaine arrived in the afternoon.

Randy exercised at the weekend.

Lily phoned on Christmas Day.

Claire jogged in the morning.

Complex Rule Sentences

Complex Grammatical Type 1

The girl plays in the park and the boy plays in the yard.

The letter in the bag and the book is on the chair.

John works in the shop and Mary works in the hospital.

The milk is in the glass and the coffee is in the hospital.

Complex Grammatical Type 3

Where the children are is on the beach.

Where Eric and Jill are is at home.

Where the President lives is in Washington not in Boston.

Where Jane sits is on the sofa not on the stool.

Complex Grammatical Type 5

Where the cats sleep is on the floor.

Where Bill and Jim eat is at the table.

Where the President and his dog live is in Washington not in Boston.

Where Jane and Jim sit is on the sofa not on the stool.

Appendix B

Parts of GJT and CWT for Post-test

1. GJT for Post-test

Choose one answer for each sentence.

1. Paul drove across the city.

Grammatical ungrammatical not sure

2. Where Helen is is in New York.
Grammatical ungrammatical not sure
3. Round the track Bill raced.
Grammatical ungrammatical not sure
4. In the afternoon Lily phoned.
Grammatical ungrammatical not sure
5. I enjoy being in the English class.
Grammatical ungrammatical not sure
6. Where the children are is on the beach.
Grammatical ungrammatical not sure
7. Tom likes baseball, neither does Jack.
Grammatical ungrammatical not sure
8. Something strange happen yesterday.
Grammatical ungrammatical not sure
9. Where the birds nest is in the tree not on the rock.
Grammatical ungrammatical not sure
10. John ate dinner at seven o'clock.
Grammatical ungrammatical not sure
Grammatical ungrammatical not sure
(adapted from Robinson (1996b)

2. CWT for Post-test

Complete a sentence to have the same meaning as the given sentence.

1. John ran into the room.
= Into _____
2. Tim does not like fish, and Mary does not, either.
= Tim _____
3. I did not hear the news until last week.
= Not until _____
4. At one o'clock Tom ate lunch.
= Tom _____
5. Ellen went Paris, and there she met her friend.
= Ellen went Paris, _____
6. My dog sleeps under the chair.
= Where _____
7. Paul is reading a newspaper and he is sitting on the sofa.
= Paul is reading a newspaper, _____

8. Susan phoned in the morning.
= In _____
9. In the park John plays and in the room Tom studies.
= John _____
10. Tom is in Seoul.
= Where _____

Appendix C

Key Points of the Simple and Complex Rules Rehearsed during the Explicit Learning Condition

Easy Rule

Into the room ran John

1. Was a location phrase used in the sentence?
2. Did the subject of the sentence come after the verb?
3. Was the phrase of time or location at the front of the sentence?
4. Was a time phrase used in the sentence?

Hard Rule

Where the cheese is is on the basket not on the table.

1. Was a contrasting location introduced by *not* used?
2. Did the subject of the sentence come after the verb?
3. Was the verb 'to be' in the singular form?
4. Did the verb used agree in tense?

(adopted from Robinson (1996b))

Appendix D

Key Points of the Simple and Complex Rules Rehearsed during the Implicit Learning Condition

Easy Rule

S = stimulus sentence; Q = follow-up question.

S. Paul drove across the city.
Q Was Paul traveling by sea?

Hard Rule

S. Where the cheese is is on the plate not in the basket.
Q. Are the children in bed?

(adopted from Robinson (1996b))

Appendix E

Experiment Procedure

Pre-test (GJT/CWT)

EC (N=40)	EP (N=38)	IC (N=28)	IP (N=26)
First Session	First Session	First Session	First Session
Rule Explanation	Rule Explanation	Memorization & Meaning-based reading	Memorization & Meaning-based reading
1. Simple rule: 20 sentences 2. MC questions: 20 sentences	1. Simple rule: 20 sentences 2. Writing task: 20 sentences	1.Simple rule: 20 sentences 2. MC questions: 20 sentences	1. Simple rule: 20 sentences 2. Writing task: 20 sentences
Feedback	Feedback	Feedback	Feedback

1-week interval

Second Session	Second Session	Second Session	Second Session
Rule Explanation	Rule Explanation	Memorization & Meaning-based reading	Memorization & Meaning-based reading
1. Complex rule: 20 sentences 2. MC questions: 20 sentences	1. Complex rule: 20 sentences 2. Writing task: 20 sentences	1.Complex rule: 20 sentences 2. MC questions: 20 sentences	1. Complex rule: 20 sentences 2. Writing task: 20 sentences
Feedback	Feedback	Feedback	Feedback

*MC= multiple choice

Post-test (GJT/CWT)

Examples in: English
Applicable Languages: English
Applicable Levels: Secondary education and beyond

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