The Effects of Prior Knowledge of the Target Form on Noticing during Output Production

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This study examined the effects of learners’ prior knowledge of a linguistic form on the noticing function of output (Swain, 1995), which might mediate second language (L2) production and learning. Based on the degree of prior knowledge of the target form, the participants were divided into four levels. The noticing scores (measured by underlining in the subsequent input) showed that Level 2 participants—who had partial knowledge of the target form—noticed more target forms than the other levels and the comparison group. The participants in the experimental group produced more target forms on the second output activity than on the first output activity. However, learners’ increased noticing did not lead to immediate increased improvement of production and learning. Some prior knowledge of the target form was able to mediate noticing of the form, but one-time noticing might not be enough for promoting improvement of production and learning of the target form.

I. INTRODUCTION

Recent research in second language acquisition (SLA) has put an emphasis on the beneficial roles of noticing and attention in second language (L2) learning (Robinson, 1995; Schmidt, 1990, 1995, 2001). Schmidt (1990), in particular, argued in his noticing hypothesis that people learn about things when they pay attention to them, but people cannot learn things they do not attend to. The noticing hypothesis holds that the attended input that the learner notices becomes intake, and intake triggers acquisition. Thus, noticing and attention are necessary and sufficient conditions for long-term memory and language learning (Schmidt, 2001).

Considering noticing and attention as crucial areas of investigation in L2 learning, many empirical studies have explored how to encourage learners to pay more attention to form
during meaning-oriented activities and suggested relevant instruction techniques. For example, consciousness-raising or input enhancement (Rutherford & Sharwood Smith, 1985; Sharwood Smith, 1981) and focus on form (Doughty, 2001; Doughty & Williams, 1998; Long, 1991) are pedagogical proposals for drawing learners’ attention to form in the input during meaning-oriented activities. In addition to these learner-external techniques, results from several studies have suggested that learners’ output production as a learner-internal device can play a crucial role in leading learners to pay attention to form (Izumi, 2002; Izumi & Bigelow, 2000; Izumi, Bigelow, Fujiwara, & Fearnow, 1999; Swain, 1985, 1995; Swain & Lapkin, 1995).

With respect to output as an attention-drawing device, Swain (1985) first pointed out that output has a noticing/triggering function. Output is able to force learners to pay attention to linguistic forms which might be needed to successfully convey their intended messages. Empirical studies thus examined learners’ noticing of linguistic forms in the subsequent input by comparing output-activity groups with input-activity groups (e.g., Izumi, 2002; Izumi & Bigelow, 2000; Izumi, et al., 1999; Mi-Jeong Song, 2007; Mi-Jeong Song & Bo-Ram Suh, 2008; Swain & Lapkin, 1995). These studies assumed that learners might pay more attention to the target linguistic forms in the subsequent input after experiencing an interlanguage problem during previous production. However, on the whole, these studies obtained mixed results with no unique effects of output, providing only partial support for the noticing function of output.

The mixed research findings may have been due to the lack of control for a learner-internal factor, namely prior knowledge of the target linguistic form. Depending upon the knowledge of the target form, it may be possible for the learner to show differential noticing and attention. Thus, to help output production trigger noticing of an interlanguage problem and attention to the problematic linguistic form in the subsequent input, we need to investigate how much knowledge of the form is needed in the learner’s interlanguage system. However, no study to date has touched on this issue in detail. The present study thus explored the role of learners’ prior knowledge of a linguistic form in making output production function as a trigger of the learner’s noticing of and attention to the form.

II. LITERATURE REVIEW

1. Noticing

Noticing refers to the process of bringing some stimulus in the environment into focal attention (Schmidt, 1994). It is also identified as focal awareness, one of the three levels of
The Effects of Prior Knowledge of the Target form on Noticing during Output Production

awareness (Schmidt, 1990). According to Schmidt (1990), the notion of consciousness can be defined as having several senses: consciousness as awareness, consciousness as intention, and consciousness as knowledge. Among the three senses, consciousness is most frequently regarded as awareness, which involves three levels internally: Level 1 is perception, Level 2 is noticing (i.e., focal awareness), and Level 3 is understanding. Perception is identified as “the ability to create internal representations of external events” (p. 132), and it is not necessarily a conscious event. Noticing among the three levels can represent the basic sense of awareness, and it is commonly, though not always, defined as availability for verbal report. Level 3, understanding, includes thinking, problem solving, and doing metacognition (i.e., awareness of awareness).

In particular, Schmidt argued for noticing at the level of awareness to be crucial to language learning. That is, he claimed that subliminal (i.e., unconscious) language learning is impossible, and intake is what learners consciously notice. As the empirical evidence for this argument, Schmidt and Frota (1986) found that what was noticed could be produced while what was not noticed was never produced. Also, they argued, “it may be that those who notice most are those who pay attention most” (p. 144).

In addition, Schmidt (2001) argued “attention is the necessary and sufficient condition for long-term memory storage” (p. 16) because unattended stimuli persist in the immediate short-term memory for only a few seconds at best. Thus, Schmidt’s Noticing Hypothesis claims that noticing crucially requires focal attention on the part of the learner and it is the necessary and sufficient condition for the conversion of input to intake for learning.

2. Output Production

Traditional approaches to SLA (e.g., Krashen, 1981) viewed output production as a way of practicing already existing knowledge, not as a way of creating new knowledge. However, current views in SLA hold that output production is not only the means by which learners practice their interlanguage for greater fluency, but also a potentially important determinant in the learning process (Gass & Selinker, 2008). Swain (1985), in particular, argued that output production plays a crucial role in L2 learning in her output hypothesis, which posits that learners need not only comprehensible input but also comprehensible output, especially, pushed output. This hypothesis was based upon the observation of the failure of French immersion students to reach native-like levels in spite of abundant input (Allen, Swain, Harley, & Cummins, 1990). Swain suggested that the failure might, in part, be due to the lack of opportunities to participate in classroom conversation and that when learners have to make efforts to ensure that their output is comprehensible (i.e., produce pushed output), learning may be fostered because production may encourage the learner to pay attention to syntactic processing rather than
semantic processing.

Moreover, Swain (1995, 2005) argued that output production can serve the function of improving accuracy in addition to the function of building up fluency by specifying three functions of output in L2 learning: Noticing/triggering, hypothesis-testing, and metalinguistic functions. Of these functions of output, the current study focuses on the noticing/triggering function of output. Output can help learners to notice the gap between their interlanguage (i.e., what they can say) and the target language form (i.e., what they want to say), and thus noticing their problems draws their attention to something they need to discover about their L2. That is, learners can recognize their interlanguage problems by noticing a hole in their interlanguage through output production, which might trigger the attention of the problematic forms in the subsequent input when it is provided.

With respect to this noticing function of output, Izumi and his colleagues (Izumi & Bigelow, 2000; Izumi et al., 1999) addressed specific questions whether output production would make learners recognize the gap between what they know and what they want to produce, and thus it would prompt them to seek out subsequent input with more focused attention. They analyzed ESL learners’ past hypothetical conditional production in English. The assumption was that noticing problems during production could trigger the noticing of the English past hypothetical conditional items in the subsequent input containing the target forms. They obtained mixed results, however. Izumi et al. (1999) exploited two tasks, reconstruction and free essay-writing tasks in consecutive order, to examine this issue. They found that reconstruction tasks resulted in noticing and immediate incorporation of the target form, whereas free essay-writing tasks showed no noticeable results in noticing, providing a partial support for the hypothesis that output promotes noticing. On the other hand, Izumi and Bigelow (2000) replicated Izumi et al.’s (1999) study by changing the ordering of tasks because task variables might have affected the results. The results, however, indicated no unique effect of output on noticing and second language acquisition.

Recent empirical studies (e.g., Izumi, 2002; Mi-Jeong Song, 2007; Mi-Jeong Song & Bo-Ram Suh, 2008) have also addressed this noticing issue related to output production by comparing it to input-activity techniques. Izumi (2002) compared the effects of output and visual input enhancement on the acquisition of English relativization by adult ESL learners by examining the noticing function of output versus input enhancement. The result indicated that the group with output-input activities noticed more than the group exposed only to the same input for the sole purpose of comprehension. Moreover, the output-input group showed gains in learning while visual input enhancement did not.

Likewise, Mi-Jeong Song (2007) examined the effect of typographical input enhancement, output (i.e., picture-cued writing), and their combined effects, and found that the output-activity groups outperformed the non-output group in noticing but there
was no combined effect. In addition, Mi-Jeong Song and Bo-Ram Suh (2008) examined the noticing function of output by comparing two output tasks (i.e., reconstruction task vs. picture-cued writing task) and a non-output task, and found that the output groups outperformed the non-output group in noticing, but there was no output task effect. These three recent studies’ findings showed that output-related activities outperformed input-related activities in the noticing of and attention to the target form, whereas the previous studies (i.e., Izumi & Bigelow, 2000; Izumi et al., 1999) obtained mixed results. These mixed results might be due to learners’ individual differences in terms of prior knowledge of target forms. However, there has been no study to address this specific question in detail and further investigation of this issue is necessary.

3. The Focus of the Present Study

The purpose of this study is to examine the noticing function of output depending on the degree of learners’ knowledge of a target structure, the past hypothetical conditional in English. Learners’ knowledge, according to psycholinguistic accounts, is considered to be inseparable from actual use. In other words, psycholinguists focus not only on competence but also performance unlike the linguistic accounts\(^1\). In addition, the psycholinguistic accounts focus on the extent to which the learner has achieved mastery over the formal and functional properties of language and the mental processes involved. Thus, it is assumed that mastery is gradient, that there are degrees of knowing, and that it is possible for learners to partially know a certain rule or form (Ellis, 1994).

Following the psycholinguistic accounts, this current study assumed that knowledge of a target form is gradient and the degree of mastery can be measured. In addition, it is hypothesized that the degrees of the participants’ knowledge of the target form might affect the noticing of the form and improvement of production as well. Moreover, it was also hypothesized that the noticing of the target form during output production and attention to the form might trigger learning of the form. The research questions in detail are as follows:

Research question 1: Does learners’ prior knowledge of a linguistic form mediate the noticing function of output (the noticing of the target form when input including the form is subsequently provided)?

Research question 2: Does learners’ noticing of the form lead to improvement of production and learning of the target form?

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\(^1\) Linguistic accounts of interlanguage knowledge have generally focused on learners’ competence, concerned with what learners know, not with what they do. Linguistic knowledge is traditionally described in terms of abstract underlying rules.
III. METHOD

1. Target structure

The target structure of this study was the past hypothetical conditional in English (e.g., *if she had been on time, they could have caught the bus*). It is a complex structure, which many L2 learners experience difficulty in learning and mastering (Izumi and Bigelow, 2000; Izumi et al., 1999). Because the structure is composed of several features such as modals (*would, could*), aspectual auxiliaries (*have, had*), copula in the past participle form (*been*), complementizer (*if*), and the past participle ending (*-ed and –en*), the extent to which learners have knowledge of this structure can be estimated based on a count of how many features they know. Therefore, this target structure is appropriate to measure the degree of learners’ linguistic knowledge of the structure.

2. Participants

The participants were 69 intermediate Korean EFL learners, who were all undergraduate students in Seoul, Korea. Most of the participants were freshmen or sophomores with TEPS (Test of English Proficiency at Seoul National University) scores ranging from 501 to 700. Because nine students in the experimental group did not take the posttest, they were excluded in the data analysis. The number of the participants included in data analysis was 60 students (24 females) in total: 42 students in the experimental group and 18 students in the comparison group. Each participant received a small gift for participating.

3. Procedures

Two weeks before performing the experimental task, the participants took a pretest for 30 minutes, which consisted of multiple-choice, grammaticality judgment, paraphrasing, and fill-in-the-blank-in-context questions (see Appendix A). The first two parts on the pretest were the multiple-choice test and the grammaticality judgment test. These perception tests were designed to test the participants’ perception and recognition of the target form (i.e., its existence) and to show their basic knowledge of the target form. The last two production tests, i.e., paraphrasing questions and fill-in-the-blank-in-context questions, were conducted to examine the participants’ production and to test their usage

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2 More students were randomly assigned to the experimental group than the comparison group, because the experimental group needed to be further divided into four sub-groups depending upon the level of knowledge of the target structure measured by a pretest.
and use of the target form, respectively. The participants were instructed to do their best to answer all the questions. The general procedure is illustrated in Figure 1.

FIGURE 1
Procedure for the Experimental and Comparison Groups

Pretest (30 min)
(Two weeks prior to the treatment session)

Describe pictures in Korean (5 min)

Experimental Group
Output I (20 min)
Input & Underline (5 min)
Output II (15 min)

Comparison Group
Input I (10 min)
Comprehension Test (20 min)
Input II & Underline (5 min)

Posttest (30 min)

On the day of the experiment, all the participants were given a picture cue3 (i.e., a line-drawing cartoon strip without any text, see Appendix B) and were asked to describe it in their mother tongue, Korean. After telling a picture-cued story in Korean, the participants in the experimental group wrote the same story in English guided by the same picture cue as the previous one. After writing the story in English at their own pace (approximately 20 minutes), the participants were provided with a reading passage (i.e., a sample writing to the picture-cued story, see Appendix C) and directions to underline words—at most four words at one time—which they would consider important if they were to reproduce the same passage again. Then, the participants in the experimental group wrote out the same story again at their own pace for approximately 15 minutes. As soon as they had performed the second writing task, they took an immediate posttest.

3 The picture cue was given to every participant because there is a possibility that free-writing may place a heavy cognitive burden on the participants. The picture-cued activity was believed to lessen some of the load of creating a story by comprehending the cartoon strip and writing a story based on the strip.
which had the same construction as the pretest but slightly different questions from those of the pretest.

On the other hand, the participants in the comparison group were instructed to read the sample passage in English representing the picture-cued story carefully and repeatedly for ten minutes after telling a picture-cued story in Korean. Then, a comprehension check-up was carried out for 20 minutes instead of writing tasks (see Appendix D), followed by the same sample passage as input. The comprehension check-up consisted of ten multiple-choice questions, half of which were inference questions and half of which were easy factual questions. This test was conducted to lead the participants in the comparison group to pay attention to the meaning of the given passage, not to the target forms. In the second input after the comprehension check-up, the participants in the comparison group were provided with the same reading passage as the sample writing that was given to the experimental group, and they were asked to underline words they considered important to understand the story for five minutes. As soon as they read the passage and underlined words, they took an immediate posttest.

4. Scoring

To measure the degree of learner’s knowledge on the target structure prior to output production, recognition and production responses on the pretest were scored. The pretest was designed to classify the levels of the participants according to the degree of the knowledge of the target form; that is, knowledge of existence of the form, knowledge of the form, knowledge of the usage, and knowledge of the use. In particular, the multiple-choice test and the grammaticality judgment test were designed to test the participants’ knowledge of the existence of the form and knowledge of the form. The paraphrasing test and the fill-in-the-blank-in-context test were designed to test knowledge of the usage and knowledge of the use, respectively.

The experimental groups were divided into four sub-groups from Level 1 to Level 4 according to both the quantitative and the qualitative analyses. The participants’ answers were qualitatively analyzed by first considering whether they knew the existence of the form. If the participants were aware of the existence of the target form but did not perfectly comprehend nor produce the correct form, they were grouped into Level 1. The participants in Level 1 were able to choose some correct answers on the receptive tests but never produced the correct item of the target form.

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4 There was no participant allotted to Level 0, because all the participants were at least aware of the existence of the form due to formal instruction during high school years.
The next consideration was whether they knew usage (i.e., linguistic rules)\(^5\) of the form or not. Those participants assigned to Level 2 were aware of the correct form but could not produce it perfectly. That is to say, they knew the target form to some extent but did not have clear knowledge of the linguistic rules associated with it. The participants in Level 2 were able to produce the correct form only partially, for example, correctly producing only if-clauses or only main clauses among past hypothetical phrases in English.

The final consideration was whether they knew use\(^6\) of the target form. If the participants knew the correct target form and produced it by rote but could not use it in appropriate contexts, they were assigned to Level 3. In other words, the participants in Level 3 were not able to produce correct answers on the fill-in-the-blank-in-context tests. The participants who were aware of both the usage and the use of the target form and produced it perfectly were assigned to Level 4. The participants in Level 4 were regarded as having already reached the acquisition of the target form. According to these criteria, the levels of the participants’ knowledge on the target linguistic form could be categorized, as illustrated in Table 1.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>The Levels of Knowledge of a Linguistic Form</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level 0</td>
</tr>
<tr>
<td>Existence of the form</td>
<td>–</td>
</tr>
<tr>
<td>Form</td>
<td>–</td>
</tr>
<tr>
<td>Usage</td>
<td>–</td>
</tr>
<tr>
<td>Use</td>
<td>–</td>
</tr>
</tbody>
</table>

Also, quantitative criteria were considered. The participants received one score when they chose the correct answer on the multiple-choice test. On the grammaticality judgment test, a score was provided both for choosing the right answer in deciding whether it is correct or incorrect and for correcting the form perfectly if incorrect. On the paraphrasing questions and the fill-in-the-blank-in-context questions, if the participants wrote down the perfectly correct target form, they received one score. In addition, partial answers were considered to have been evidence for the degree of the knowledge of the target form. For example, in the paraphrasing questions, a partial correct answer like “If I had been hungry, I would eat something.” was given half score because it contained correct forms in the if-clause but incorrect forms in the main clause.

\(^5\) “Usage” refers to “that aspect of performance which makes evident the extent to which the language user demonstrates his knowledge of linguistic rules” (Widdowson, 1978, p.3).

\(^6\) According to Widdowson (1978) again, “use” refers to that aspect of performance which “makes evident the extent to which the language user demonstrates his ability to use his knowledge of linguistic rules for effective communication” (p.3).
With regard to the total pretest scores (in percentages) according to the quantitative criteria described above, the participants who were assigned to Level 1, in accordance with the qualitative criteria obtained 6 to 20 in the total score; the participants in Level 2, 20 to 53 in the total score; the participants in Level 3, 53 to 80 in the total score; and the participants in Level 4, above 86 in the total score. The result of the quantitative analysis corresponded to that of the qualitative analysis, leading to fourteen participants in Level 1, ten participants in Level 2, twelve participants in Level 3, and six participants in Level 4.

In order to investigate the noticing of the target form, underlines were scored by counting the total number of conditional-related items the participants underlined and the total conditional-related items in the passage, which were identified with modals (would, could), aspectual auxiliaries (have, had), copula in the past participle form (been), complementizer (if), and the past participle endings (-ed and –en). For example, when the participant underlined five words, if, been, on, time, and could in the sentence “If she had been on time, they could have caught the bus,” he/she obtained 50% (i.e., three out of six), because three conditional-related items, if, been, and could were underlined among six conditional-related items in this sentence, if, had, been, could, have, and caught. Total underlining scores were calculated in percentages, dividing the underlining of the conditional-related items by the total number (21) of the conditional-related items given in the whole passage.

The output productions were analyzed by means of counting all the conditional-related items the participants produced and the obligatory items the participants should have produced correctly. The output results were also calculated in percentages, dividing the total number of the learner’s production of conditional-related items by the total number of the obligatory items. If the participants, for example, produced if she had come on time, they could buy the tickets, the number of the conditional-related items produced was four, if, had, come, and could. The number of the obligatory items that should have appeared in the sentence was six, because it should have also included the items, have and bought in the main clause in addition to four items, if, had, come, and could. All output productions were analyzed in accordance with this metric.

5. Analyses

The data in this study were analyzed with a one-way ANOVA to examine the noticing of the target form by counting the underlines in the input. A repeated-measures ANOVA test was performed to analyze the production improvement. Level (1-4) was entered as a between-subject factor and Output Task (output 1 vs. output 2) was entered as a within-subject factor. Also, the pre- and posttest scores were compared with repeated measures ANOVAs to examine the learning of the target form.
IV. RESULTS

1. Noticing

This study first addressed the question whether the prior linguistic knowledge of the target form would mediate noticing of the target form during an output activity and attention to the form in the subsequent input. In order to examine this issue, underlines made during the input of the four levels in the experimental group and comparison group were compared (see Table 2 for mean underlining scores).

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean (%)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1</td>
<td>14</td>
<td>23.81</td>
<td>14.59</td>
</tr>
<tr>
<td>Level 2</td>
<td>10</td>
<td>44.29</td>
<td>31.35</td>
</tr>
<tr>
<td>Level 3</td>
<td>12</td>
<td>17.06</td>
<td>17.28</td>
</tr>
<tr>
<td>Level 4</td>
<td>6</td>
<td>21.43</td>
<td>21.97</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>18</td>
<td>18.25</td>
<td>20.56</td>
</tr>
</tbody>
</table>

The ANOVA result (see Table 3) showed that there was a significant difference ($F(4, 55) = 3.734, p < .01$). A post-hoc Dunnett $t$ test indicated that there is a significant difference between Level 2 and the comparison group (Mean difference, 26.03, $p < .01$). A post-hoc LSD test also showed that Level 2 was significantly different from the other levels in the experimental group ($ps < .05$).

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>$F$</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>5326.909</td>
<td>4</td>
<td>1331.727</td>
<td>3.734</td>
<td>.009</td>
</tr>
<tr>
<td>Within Groups</td>
<td>19614.890</td>
<td>55</td>
<td>356.634</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>24941.799</td>
<td>59</td>
<td></td>
<td></td>
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</tbody>
</table>

2. Production Improvement and Learning

The second research question was to investigate whether learners’ noticing of the target form promoted the use of the target form. The descriptive statistics for output activities is presented in Table 4.
TABLE 4
Descriptive Statistics for Production

<table>
<thead>
<tr>
<th>Experimental Group</th>
<th>Output Activities</th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Output I</td>
<td></td>
<td>Output II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean (%)</td>
<td>SD</td>
<td>Mean (%)</td>
<td>SD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1 (N=14)</td>
<td></td>
<td>39.23</td>
<td>20.68</td>
<td>53.45</td>
<td>25.65</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2 (N=10)</td>
<td></td>
<td>52.50</td>
<td>30.29</td>
<td>72.50</td>
<td>28.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3 (N=12)</td>
<td></td>
<td>72.08</td>
<td>30.42</td>
<td>86.65</td>
<td>21.39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 4 (N=6)</td>
<td></td>
<td>82.47</td>
<td>20.14</td>
<td>94.44</td>
<td>9.75</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Production of the target form in the two output activities was entered as a within-subject variable in a repeated measures ANOVA. The four levels of the experimental group was a between-subject variable. The ANOVA showed that there were main effects of output activities \( F(1, 38) = 9.808, p < .01 \) and experimental group level \( F(3, 38) = 7.731, p < .01 \) as presented in Table 5. No interaction was found \( F < 1 \). The experimental group produced more target forms on the second output activity than those on the first output activity. A post-hoc LSD test indicated that the production of Level 3 and 4 participants significantly outperformed that of Level 1 participants \( p < .01 \).

TABLE 5
ANOVA Results for Output Production Improvement

<table>
<thead>
<tr>
<th></th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Levels</td>
<td>21379.387</td>
<td>3</td>
<td>7126.462</td>
<td>7.731</td>
<td>.000</td>
</tr>
<tr>
<td>Error</td>
<td>35026.286</td>
<td>38</td>
<td>921.744</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output (I &amp; II)</td>
<td>4389.812</td>
<td>1</td>
<td>4389.812</td>
<td>9.808</td>
<td>.003</td>
</tr>
<tr>
<td>Output * Levels</td>
<td>153.559</td>
<td>3</td>
<td>51.186</td>
<td>.114</td>
<td>.951</td>
</tr>
<tr>
<td>Error</td>
<td>17008.393</td>
<td>38</td>
<td>447.589</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In addition, the pretest and posttest were compared to examine the participants’ learning of the target form. The 2 x 4 Repeated-Measures ANOVA was performed to analyze the main and interaction effects of time and levels. The descriptive statistics and ANOVA results are presented in Table 6 and Table 7, respectively. The groups (four levels and comparison group) were entered as a between-subject factor and Time (pretest vs. posttest) was entered as a within-subject factor. The results showed that there was a main effect of the groups \( F(4, 55) = 16.66, p < .01 \). A post-hoc Dunnett t test indicated that the control group was different from Levels 1 and 4 (Mean difference, 26.24, 39.63, \( p < .01 \)). In addition, there were differences among each level in the experimental group \( p < .01 \), though the difference between Level 1 and 2 \( p = .068 \) was only marginal. However, no significant difference was found between pretest and posttest scores and no interaction \( F's < 2 \).
TABLE 6
Descriptive Statistics for Pretest and Posttest

<table>
<thead>
<tr>
<th>Tests</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (%)</td>
<td>SD</td>
</tr>
<tr>
<td>Experimental Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1 (N=14)</td>
<td>13.33</td>
<td>3.56</td>
</tr>
<tr>
<td>Level 2 (N=10)</td>
<td>33.33</td>
<td>9.43</td>
</tr>
<tr>
<td>Level 3 (N=12)</td>
<td>61.67</td>
<td>10.23</td>
</tr>
<tr>
<td>Level 4 (N=6)</td>
<td>90.00</td>
<td>3.33</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>44.45</td>
<td>28.20</td>
</tr>
</tbody>
</table>

TABLE 7
ANOVA Results for Pretest and Posttest

<table>
<thead>
<tr>
<th></th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>Levels</td>
<td>4</td>
<td>11631.835</td>
<td>16.661</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>55</td>
<td>698.191</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>Tests (Pre-Post)</td>
<td>1</td>
<td>186.208</td>
<td>1.248</td>
<td>.269</td>
</tr>
<tr>
<td></td>
<td>Tests * Levels</td>
<td>4</td>
<td>292.094</td>
<td>1.957</td>
<td>.114</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>55</td>
<td>149.235</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

V. DISCUSSION

This study examined the effect of the learners’ prior knowledge of a linguistic form on the noticing function of output production. The experimental group was divided into four levels depending on the degree of knowledge of the target form. The participants in Level 2, who had partial knowledge of the target form, were able to notice the form more than the comparison group and the other levels within the experimental group after having experienced a problem in their interlanguage during the output production. This might be because despite being aware of the target form, the participants in Level 2 experienced a difficulty in producing the target form, which could have indicated to them that they were lacking command of the correct usage of the form. In addition, the participants in Level 2 might have been developmentally ready to notice and learn the target form (Pienemann, 1999, 2007), and they were thus able to allocate more attentional resources\(^7\) to the target form than other participants who were not ready to be aware of the target form or who had already passed the developmental stage and had no difficulty in understanding and

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\(^7\) In the psycholinguistics literature, when learners pay attention to forms, they allocate resources in working memory selectively to the items (Stine-Morrow, Miller, & Hertzog, 2006).
producing the target form.

In other words, the participants in Level 1 could not allocate attentional resources to the target form because they had no knowledge of the form at all. Although it was assumed that Level 1 participants were given explicit grammar instructions in school, they were not ready to notice the target form and had no idea of the target form and grammar, which therefore apparently did not draw their interest and attention sufficiently so as to facilitate learning. On the contrary, the participants in Level 3 and 4 did not allocate attention to the target form, perhaps because they already passed the developmental stage in which abundant noticing and attention might be essential because they had sufficient knowledge of the target structures to produce them. Thus they might not have felt the need to learn more about it.

These results can help explain the mixed findings reported in the literature. As the results here showed, when participants have some prior knowledge of target forms with language proficiency controlled for, output production is able to mediate noticing and attention. Izumi et al. (1999) and Izumi and Bigelow (2000) did not take this factor into account and thus obtained no unique result. On the other hand, the studies which found positive results gave at least cursory consideration to participants’ intermediate proficiency and sometimes even rudimentary knowledge of target forms. In particular, Mi-Jeong Song (2007) and Mi-Jeong Song and Bo-Ram Suh (2008) observed that participants with intermediate proficiency showed more noticing in output-related activities than in input-related activities. In addition, Izumi (2002) limited participants to those who have some rudimentary knowledge of target forms and screened them to sort out extreme cases such as some highest and lowest scores on the pretest, which included receptive and production questions related to target forms, and obtained the findings supporting the function of output. Therefore, the degree of learners’ knowledge of the target form might have influenced the mixed results in the previous studies.

To verify that the results obtained in this study were due to the degree of learners’ prior knowledge of the target form, another statistical analysis was performed by pooling all the levels in the experimental group together and comparing them to the comparison group as other previous studies have done (e.g., Izumi & Bigelow, 2000; Izumi et al., 1999). A t-test for independent samples showed that there was no significant difference (t < 2) between the experimental and comparison groups. This is consistent with the results of Izumi et al. (1999) and Izumi and Bigelow (2000), failing to support the unique effects of output on noticing. Because their experimental groups, which performed the output activities, were not classified according to the degrees of knowledge of the target form, a null result was obtained. Therefore, the mixed findings of previous studies by Izumi et al. (1999) and Izumi and Bigelow (2000) may result from their lack of consideration for the degree of knowledge of the linguistic forms under consideration.
The results of this study can provide both support for and constraints on the output hypothesis. Output production can function as a trigger of noticing and attention only when some degree of prior linguistic knowledge of target forms exists in the interlanguage system. In this current experiment, the participants in Level 2 satisfied this condition. After experiencing difficulty in producing the target form on the first output task, they paid careful attention to the form in the subsequent input because they had some prior knowledge of the target form and were aware of their problems.

The participants’ performance on the posttest, however, was not different from the baseline pretest. Although prior linguistic knowledge is necessary for output production to play a role in promoting the noticing of the form, it does not seem to directly lead to learning. These results might be due to the one-time activity used in here. Repeated activities like structural (or syntactic) priming activities (Jeong-Ah Shin, 2008; Jeong-Ah Shin & Christianson, under review; McDonough, 2006) might be necessary to promote more production and learning. Structural priming activities involve sentence production (i.e., syntactic repetition, with different lexical items) and help learners notice target structures through repetition of structural patterns (Jeong-Ah Shin & Christianson, under review). In particular, Jeong-Ah Shin and Christianson’s experiment showed that when structural priming activities were combined with explicit instruction, learning was promoted, arguably due to increased noticing. Thus, repeated output production can lead to learning in addition to noticing.

VI. CONCLUSION

This study investigated the effects of knowledge of the target form on the noticing function of output, which was described by Swain (1995) as the output hypothesis. Several previous studies did not reveal a unique noticing function of output, but failed to consider a potentially crucial element: learners' knowledge of the target structure. This study thus specified and examined the degree of knowledge of target forms as a crucial element of triggering the noticing function of output. It was found that the learner knowledge of a target form influenced noticing of and attention to the target form. Participants who had some knowledge of the target form noticed it better than both participants with no knowledge of the form and also participants with advanced knowledge of the form. It was argued that these participants outperformed the no-knowledge group because they had enough knowledge of the form to notice the imperfection of the form in their own interlanguage systems. It was also argued that the higher-level groups failed to perform as well due to the perception that they felt confident enough with the target form that they did not need to allocate further attentional resources to it.
There are several important pedagogical implications from this study. First, without any knowledge on a form, learners cannot notice the form during output production. Thus, output-oriented focus on form instruction is effective only for those learners who have partial knowledge of the target form. After an explicit instruction of the target form is given, output activities can help learners notice and learn the target form. In particular, as mentioned above, repeated output-related activities like structural (or syntactic) priming activities can be pedagogically effective in that these activities can promote learners’ noticing and attention and eventually learning of the target form (Jeong-Ah Shin & Christianson, under review). Second, unlike external techniques such as input enhancement and input flooding, learners can voluntarily and internally allocate attention to the target form through output, and noticing through output production can help learners actively learn the target form by leading the allocated attention to focus on the grammatical processing of the form. In this respect, research on output-related activities can shed light on the development of a more effective instruction for improving learners’ production accuracy as well as fluency. For example, reconstruction or picture-cued production activities are output-oriented focus on form activities. These activities can lessen the load of semantic construction (i.e., meaning construction) and focus more attention on syntactic processing (i.e., form construction) when learners reconstruct prior passages or stories.

This study does have some limitations. First, more sophisticated measurement is necessary to evaluate participants’ knowledge on the target form, such as think-aloud protocols (Leow & Morgan-Short, 2004). Second, more reliable psychological methods are needed to examine learners’ noticing and attention besides underlining, such as eye-tracking experiments (e.g., Frenck-Mestre, 1999, 2002; Frenck-Mestre & Pynte, 1997). Third, learning might not have occurred because the one-time activity might have been insufficient for learning. Therefore, a repeated, long-term research should be designed for future investigations to examine learning by means of the noticing function of output. Fourth, this study did not control for other learners’ internal factors like their attitude and motivation. Fifth, a further investigation is needed to examine whether the participants used the target form as a fixed expression without an analysis of the linguistic features. Finally, the unequal and small number of the participants in each knowledge level (especially, Level 2) may be a problem, which often constrains the generalizability of the statistical results. Despite these shortcomings, the present study was able to identify a critical aspect of the noticing function of output and its role in L2 learning, which had been uncontrolled in previous research.
REFERENCES


research in cross-cultural perspective (pp. 39-52). Amsterdam, The Netherlands: John Benjamin.


**APPENDIX A**

**Pretest (Posttest) Examples**

Part 1: Choose the most appropriate answer.

1. Mary wishes that her boss _________ her salary.
   a. raises
   b. would raise
   c. will raise
   d. was raising

2. If she _________ chosen to study in Los Angeles, she would have had to find a new house.
   a. has
   b. would have
   c. will have
   d. had

3. If I didn’t go to their party, they ____________ offended.
   a. be
   b. would have been
   c. have been
   d. are

4. The view was wonderful. I _________________ some photographs, if I’d had a camera.
   a. would take
   b. took
c. would have taken
d. had taken

5. If Portugal _______________ political problems, this situation might not have occurred.
a. would not have
b. did not have
c. had not been having
d. has not had

Part 2: Choose one between Correct and Incorrect, and if it is incorrect, correct wrong parts.
1. If you got more exercise, you might feel better. (Correct / Incorrect)
2. Ken got to the station in time to catch his train. If he had missed it, he would be late for his interview. (Correct / Incorrect)
3. A: How was your holiday? Did you have a nice time?
   B: It was OK, but we had enjoyed it more if the weather had been better. (Correct / Incorrect)
4. I’d be very frightened if somebody pointed a gun at me. (Correct / Incorrect)
5. I wasn’t tired last night. If I’d been tired, I would have gone home earlier. (Correct / Incorrect)
6. I didn’t have my address book with me when I was in Pusan. If I’d had your phone number, I could call you. (Correct / Incorrect)

Part 3: Paraphrase it with the given sentences.
1. I wasn’t hungry, so I didn’t eat anything.
   If I __________________________________________________________
2. He buys a car, so he does not take a bus any more.
   If he _________________________________________________________
3. I didn’t know that George had to get up early, so I didn’t wake him up.
   If I __________________________________________________________
4. That book is too expensive, so I’m not going to buy it.
   If the book __________________________________________________
5. Margaret wasn’t injured in the crash because she was wearing a seat belt.
   If Margaret __________________________________________________

Part 4: Fill in the blanks by changing the form of the given words, considering the context.

At the beginning of this century, Sungnam was a sleepy little town, and even as recently as the 1950s and early 1960s, there ___________ (be) farms and orchards close to our house. Of course, there
weren’t any freeways, and there used to be a good transportation system of electric trains. The air was usually very clear, and as a young child, I could see the mountains to the north and east almost every day.

However, we have got freeways, traffic, and pollution now. If you 2 __________ (see) Sungnam forty years ago, you 3 __________ (be amazed). We always 4 __________ (have) heavy traffic jams in every freeway and street. Also, Sungnam is polluted now.

If Sungnam 5 __________ (keep) its train system, we 6 __________ (avoid) some of the traffic problems. Since Sungnam grew so fast, we 7 __________ (have) so many problems today. No one 8 __________ (anticipate) all these things; otherwise, we 9 __________ (be) a lot more careful. I hope that things 10 __________ (improve) in the future.
APPENDIX B
Cartoon Strips

(1) 7:10 p.m

(2) 7:40 p.m.

(3) 7:41 p.m.

(4) 8:00 p.m.

(5) 8:15 p.m.

(6) 8:16 p.m.

(7) 8:17 p.m.

(8) 8:17 p.m.
APPENDIX C
INPUT (Sample Writing)

Situation: Tom and Mary were going to the concert that would begin at 8 p.m. So Tom was supposed to meet Mary at a bus stop at 7 p.m.

But Mary arrived at the bus stop 10 minutes late and they missed the bus. They waited for another bus until 7:40 p.m. but any bus didn’t come. So they took a taxi, instead. Unfortunately, they got caught in a traffic jam on the way to the concert. When they finally arrived at the concert hall, all the tickets had been already sold out. They were very disappointed and they regretted several things. Mary thought she should not have been late. If she had been on time, they could have caught the bus. Also, she thought if they had gotten on the bus at 7 p.m., they could have bought the tickets. On the other hand, Tom thought if he had made a reservation by phone in advance, they could have attended the concert.

APPENDIX D
The Comprehension Test for the Comparison Group

1. Why did Tom and Mary have to wait for a bus for such a long time?
   a. Tom did not make a reservation.
   b. They enjoyed themselves at home.
   c. They ate dinner together.
   d. Mary did not arrived on time.

2. What did Tom and Mary finally do in order to get to the concert?
   a. They took train.
   b. They went to the concert hall on foot.
   c. They took taxi.
   d. They followed the bus they missed.

3. What can you assume?
   a. It is likely that the bus left just before 7:10.
   b. Mary seems to dislike Tom.
   c. Mary was not willing to attend the concert.
   d. Mary did not want to meet Tom.

4. On the way to the concert what happened on the highway?
   a. The highway was under construction.
   b. A car accident took place.
   c. Many cars were on the highway.
   d. Several cars were racing.

5. What caused Tom and Mary to be in trouble getting to the concert?
a. They fought, blaming each other.
b. They took immediate actions on attending the concert.
c. Any bus didn’t come and they stood waiting for a bus for a long time.
d. They did not decide whether they would attend the concert or not.

6. How did Tom and Mary feel?
   a. They were happy when they meet at the bus stop.
   b. They felt that they were a very ill-matched couple.
   c. They were very nervous when they were waiting for a bus.
   d. They were satisfied with their dating.

7. What did Tom and Mary think when they arrived at the concert hall?
   a. Tom hardly blamed for his carelessness.
   b. Mary thought meeting at a bus stop was a bad idea.
   c. Mary felt regret for being late.
   d. Tom thought he would make a reservation next time.

8. What is true according to the passage?
   a. Tom and Mary were able to participate in the concert.
   b. Tom and Mary were depressed.
   c. Tom was reluctant to see the concert.
   d. Tom made a reservation before the concert started.

9. What can be inferred from the passage?
   a. Tom wanted to make a reservation but he couldn’t.
   b. Mary felt sorry that they were not able to attend the concert.
   c. Mary thought she would never keep Tom waiting again.
   d. Mary intended to make fun of Tom.

10. What cannot be inferred from the passage?
   a. Tom and Mary were supposed to take a bus for the concert hall.
   b. Tom and Mary could manage to buy the tickets.
   c. Tom and Mary thought that a taxi was faster than a bus.
   d. Tom assumed that he could buy the tickets without any reservation.

Applicable levels: college
Key words: noticing, output, degree of learners’ linguistic knowledge

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The Effects of Prior Knowledge of the Target form on Noticing during Output Production

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