An Empirical Study on the Effects of Comprehensible Input on Incidental English Vocabulary Recognition

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Abstract
This study investigates the effects of comprehensible input on incidental English vocabulary recognition. Immediately after receiving different types of input, 220 non-English major freshmen took a posttest of vocabulary recognition. The results of the current study validate the positive effects of premodified input, interactionally modified input and modified output on English learners’ incidental vocabulary recognition. Enhanced input and modified output play significantly facilitated roles in the short-term memory of English learners and further result in better instant lexical recognition.

Key words: premodified input; interactionally modified input; modified output; incidental English vocabulary recognition

1. Introduction
It has been widely accepted that input provides the linguistic data that a developing linguistic system needs to actualize acquisition. When learners receive input, they offer their developing linguistic system the data it needs to start the process of acquisition. Gass (1997: 1) once summarized that “the concept of input is perhaps the single most important concept of second language acquisition (SLA). It is trivial to point out that no individual can learn a second language (L2) without input of some sort”.

The role of input comprehension has been of the prime importance in SLA theory and research territory. This has been motivated by the belief that a learner’s exposure to the target language is not a sufficient and effective condition for an L2 acquisition. It has been a widespread conviction that input must be comprehended by the learner
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if it is to assist the acquisition process. Given the significance of input comprehension in language acquisition, current SLA research has tried to identify what makes input comprehensible to the learner, and what contributions comprehensible input makes to language acquisition.

Long (1982: 341) initially suggested four ways to make input comprehensible by modifying oral or written input, providing linguistic and extralinguistic context, orienting the communication to the simple form, and modifying the interactional structure of the conversation. On the basis of this argumentation, Park (2002: 2-3) summarized three linguistic environments as the potential sources of comprehensible input for L2 acquisition: (1) premodified input—the linguistic environment where input has been modified in some way before the learner sees or hears it; (2) interactionally modified input—the linguistic environment where a native speaker (NS) or a more competent non-native speaker (NNS) interacts with an NNS, and where both parties modify and restructure the interaction to arrive at mutual understanding; and (3) modified output—the linguistic environment where a learner modifies his/her output to make it more target-like and more comprehensible to the interlocutor. It is necessary to clarify that a learner’s modified output can serve as another learner’s comprehensible input. The following section presents related studies conducted by some scholars in SLA research territory.

2. Literature review

2.1 Premodified input

Elaborated input

Input elaboration retains difficult vocabulary items and complex syntactic structures beyond readers’ acquired language proficiency, but it offers the interpretation of the both or the either. It attempts to increase text comprehensibility by way of providing definitions of difficult vocabulary items, paraphrasing sentences containing complex syntactic structures, and enriching semantic details. Kim (2003) stated that input modification in the direction of elaboration is preferred in SLA on the grounds that elaborated input retains the material that L2 learners need for developing their interlanguage and provides with natural discourse model. It has been noted that elaborated adjustments have the advantage of supplying learners with access to the linguistic items they haven’t yet to acquire (Larsen-Freeman & Long, 1991).

Likewise, Parker and Chaudron (1987: 131-133) reviewed several related experimental studies and further concluded that elaborative modifications have a positive effect on L2 comprehension and acquisition. They also distinguished two types of elaborative modifications, those contributing to redundancy and those making the thematic structure explicit. Similarly, when Urano (2002: 5) investigated the effects of lexical simplification and elaboration on sentence comprehension and incidental vocabulary acquisition, the results confirmed that lexical elaboration is more favorable than lexical simplification in terms of both L2 reading comprehension and vocabulary acquisition. More recently,
Kong (2007) explored the effects of lexical simplification and elaboration on L2 Korean reading comprehension. The participants were assigned into the following five conditions: baseline, simplified, lexically elaborated, structurally elaborated, and lexically and structurally elaborated. The results showed that both simplified and elaborated input promoted the participants’ reading comprehension with no significant difference between the two.

Nevertheless, other studies showed that not all forms of input elaboration benefit L2 comprehension since vocabulary elaboration might lead to learners’ confusion about what an alternative is and what additional information is. Ellis (1995) cautioned that although elaborations might help SLA, over-elaborated input could be counter-productive. The research results of Brewer (2008), who studied the effects of lexical simplification and elaboration on English as an L2 readers’ local-level perceived comprehension, also indicated that the lexical elaboration group obtained the lowest mean score compared with the lexical simplification group and the control group although no statistically significant difference was found among the mean score of the three groups. To a certain degree, it seems that the facilitative role of elaborated input on L2 comprehension and acquisition is not consistent all the way.

**Enhanced input**
Sharwood-Smith (1991, 1993) introduced the concept of *input enhancement* as a way of reorienting the discussion on the role of grammar in L2 instruction, but later the targets of enhancement have been extended to highlighted lexical terms or any structures calling readers attention. Among several techniques of input enhancement, textual enhancement is the one manipulated in this study. Textual enhancement is known by using typographical cues (e.g., **boldfacing**, *italicizing*, **underlining**, coloring, enlarging the font size, **changing the font type**, or any combination of these techniques) to draw readers’/learners’ attention to particular information in a text (Wong, 2005: 56). The purpose of textual enhancement is to render more salient features of written input that learners usually may not attend to beforehand and to make form-meaning connections for the target language. Moreover, textual enhancement provides meaning-bearing input and directs learners’ attention to the target forms while encouraging them to process meaning-bearing input. A number of studies were undertaken to investigate whether textual enhancement is effective in drawing L2 learners’ attention to the target forms (Alanen, 1995; Cho, 2010; De Santis, 2007; Shook, 1994; Williams, 1999), and the results were different.

Shook (1994) examined whether textual enhancement was beneficial to acquiring Spanish present perfect tense and relative pronouns. The results revealed that the two experimental groups reading the enhanced texts performed better than the control group reading the texts without input enhancement on all the assessment tasks. Further, Shook found no difference between the group of participants who received explicit directions of paying attention to the enhanced forms, and the group of those who did not. Echoing Shook’s research, Alanen (1995) examined whether giving learners explicit rules about the target forms would make a difference to lexical acquisition. The results showed that the participants who read the texts with the italicized target forms made more mention of the
forms than those who read the unenhanced texts. Subsequently, Williams (1999) tested whether input enhancement facilitates L2 acquisition. Sixteen participants were exposed to the texts with highlighted Italian pronouns and later they took a verbatim memory task and a translation task. The results displayed that the participants who read the enhanced texts performed better than those who did not. Lately, Cho (2010) investigated the effects of textual enhancement (underlining and bolding) on learners’ noticing and on acquisition of the English present perfect tense. The results indicated that textual enhancement affected the learners’ noticing and acquisition of the target forms.

However, the effectiveness of textual enhancement in SLA is not constant. Both Robinson and White argued that many learners noticed the highlighted target form without being aware of its relevance or importance, and both provided the evidence for the short-run effects of input enhancement (as cited in Combs, 2009).

2.2 Interactionally modified input

The notion interactional modification refers to the changes to the target structures in a conversation to accommodate potential or actual problems of understanding. A number of studies were carried out to test the influence of interactionally modified input on SLA (Ellis, 1995; Ellis, Tanaka & Yamazaki, 1994; Loschky, 1989; Pica, Doughty & Young, 1986; Van den Branden, 2000).

Identical studies were conducted by Loschky (1989) and Ellis et al. (1994) who distinguished three kinds of input conditions: (1) the baseline input condition where the learners were given unmodified input; (2) the premodified input condition where the learners were given simplified or elaborated input; and (3) the interactionally modified input condition, where the learners were given baseline input, along with the opportunity to negotiate to make input comprehensible. A Pretest, an immediate posttest and a delayed posttest were administered. The results of both studies showed that interactionally modified input significantly facilitated L2 comprehension and L2 lexical acquisition.

Van den Branden (2000) tried to make distinctions between unmodified input condition, premodified input condition, collective negotiation condition and pair negotiation condition. It was found that learners displayed significantly higher scores on comprehension tests with the chance to negotiate the meaning of unknown words and phrases than being merely exposed to either the unmodified texts or the premodified texts. Both collective negotiation and pair negotiation yielded such statistically significant effects. Likewise, Baleghizadeh and Borzabadi (2007) discovered that interactional modifications improved reading comprehension more than pre-modifications did, which confirmed the findings of the previous studies.

Although the above mentioned studies reported the beneficial effects of interactionally modified input over premodified input, the results need to be interpreted with caution. Piolio and Gass (1998) pointed out that the results of these studies, in which no time limit was imposed on the interactionally modified input condition, could have been biased. Ellis (1999: 7) took this argument further, asserting that “whether the effect of interactionally modified input is beneficial to L2 acquisition depends on more input and longer processing time or the kinds of qualitative differences Long and others have claimed
to be important”. For this reason, the emphases of further studies should be played on the quality of negotiation rather than the quantity of negotiation.

2.3 Modified output
It is necessary to clarify that the distinction between the interactionally modified input condition and the modified output condition is not apparent because modified output occurs as a response to comprehensible input through interaction rather than in a vacuum (Gass, 1997). Negotiation induces learners to modify their output, which in turn may stimulate the process of acquisition. As a result, modified output must occur in an interactional environment (Ellis, 1999). Negotiation and modified output work interactionally since the modified output of one learner often works as another learner’s comprehensible input and what constitutes interaction for one learner serves as potential input for other learners who are involved in the discourse only as listeners.

In a small-scale study, Nobuyoshi and Ellis (1993) found that when L2 learners were pushed to reformulate by means of requests for clarifications responded through correcting their past-tense errors, they subsequently used the form of past tense more accurately when they repeated the task one week later. Nevertheless, the researchers failed to explain whether pushed output could help learners internalize and retain the linguistic forms over a period of time.

Similarly, Van den Branden (2000) reported that L2 learners of lower-level proficiency, who had been pushed to modify their output in the context of a two-way communicative task, produced more output. The results of the posttest provided a clear indication of the potential effects of pushed output on L2 acquisition. Ellis and He (1999) investigated the effects of premodified input, interactionally modified input, and modified output on comprehension of L2 directions in a listen-and-do task as well as on acquisition of new L2 words embedded in the directions. The results showed that the modified output group outperformed the other two groups in both comprehension of the directions and vocabulary acquisition.

Nonetheless, modified output is not always superior to other types of comprehensible input. Ogino (2008) explored whether modified output played a facilitative role in L2 learning and whether the non-target-like forms, which participants previously modified, were produced in the subsequent situations of use. The results did not clearly demonstrate whether or not learners were conscious of avoiding the use of the same non-target-like forms that they have previously modified, indicating a possibility of the limited role of modified output in L2 development.

3. Methodology

3.1 Research questions
Following the footsteps of Ellis and He (1999) who investigated the effects of premodified input, interactionally modified input, and modified output on L2 acquisition, the researcher of this study carried out an experiment to identify the comparative effects of
comprehensible input on L2 incidental vocabulary recognition. The research questions of
the current study are:

1. Do elaborated input and enhanced input influence incidental English vocabulary
recognition and what are the comparative effects?

2. Do premodified input, interactionally modified input and modified output
influence incidental English vocabulary recognition and what are the comparative
effects?

3. To what extent does comprehensible input affect incidental English lexical
recognition?

3.2 Participants
A total number of 220 non-English major freshmen (179 males and 41 females), who
enrolled in a university of science and technology in northern China in Fall 2009,
participated in the study. All participants were English as a foreign language learners
who had studied English for a period of six to seven years and who aged from 18 to 20.
A month prior to the treatment, they took English Proficiency Test (EPT), a placement
test for College English program. The students whose scores ranged from 70 to 80 were
assigned into the intermediate-level classes.

Five intermediate-level natural classes were randomly chosen to participate in this
empirical study as the five groups, among which 49 participants in the unmodified input/
baseline input/control group, 42 in the elaborated input group, 46 in the enhanced input
group, 48 in the interactionally modified input group, and 35 in the modified output
group.

The researcher of the current study was a teacher who worked at English department
of the same university and she did not contact any of the classes before the treatment.
The researcher received the permission from the English teachers of the five classes to
undertake the research and she went through the whole procedure from the pretest to the
delayed posttest.

3.3 Reading materials and target linguistic forms
The reading passage was chosen from New College English—Integrated Course Two (Student
Book), a text book published by Shanghai Foreign Language Education Press in 2003 and
would be used by the intermediate-level students in the following semester. The baseline
text was taken from Text B in Unit Three. The text was a narration on generation gap and
the title was When Father Knows Better. The original text was written by a native speaker of
English.

Thirty words and 15 expressions were selected from the reading material and assessed
in the pretest. After scoring the pretest, 20 words (seven nouns, nine verbs, and four
adjectives) and 10 expressions least known by the participants were chosen to be the target
linguistic forms of the current study (see Table 1).
<table>
<thead>
<tr>
<th>Target Forms</th>
<th>Word Form</th>
<th>CET Band</th>
<th>Frequency Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>prizefighter</td>
<td>noun</td>
<td>6</td>
<td>Off-list word</td>
</tr>
<tr>
<td>aware</td>
<td>adjective</td>
<td>4</td>
<td>AWL word</td>
</tr>
<tr>
<td>legal</td>
<td>adjective</td>
<td>4</td>
<td>AWL word</td>
</tr>
<tr>
<td>embrace</td>
<td>verb</td>
<td>4</td>
<td>Off-list word</td>
</tr>
<tr>
<td>respond</td>
<td>verb</td>
<td>4</td>
<td>AWL word</td>
</tr>
<tr>
<td>notion</td>
<td>noun</td>
<td>6</td>
<td>AWL word</td>
</tr>
<tr>
<td>disturbing</td>
<td>adjective</td>
<td>4</td>
<td>K2 word</td>
</tr>
<tr>
<td>immortality</td>
<td>noun</td>
<td>Beyond Band 6</td>
<td>Off-list word</td>
</tr>
<tr>
<td>will</td>
<td>noun</td>
<td>6</td>
<td>Off-list word</td>
</tr>
<tr>
<td>thrust</td>
<td>verb</td>
<td>4</td>
<td>Off-list word</td>
</tr>
<tr>
<td>justify</td>
<td>verb</td>
<td>4</td>
<td>AWL word</td>
</tr>
<tr>
<td>anticipation</td>
<td>noun</td>
<td>4</td>
<td>AWL word</td>
</tr>
<tr>
<td>emerge</td>
<td>verb</td>
<td>4</td>
<td>AWL word</td>
</tr>
<tr>
<td>content</td>
<td>noun</td>
<td>4</td>
<td>K1 word</td>
</tr>
<tr>
<td>rotten</td>
<td>adjective</td>
<td>4</td>
<td>K2 word</td>
</tr>
<tr>
<td>combination</td>
<td>noun</td>
<td>4</td>
<td>K2 word</td>
</tr>
<tr>
<td>spot</td>
<td>verb</td>
<td>4</td>
<td>K1 word</td>
</tr>
<tr>
<td>acknowledge</td>
<td>verb</td>
<td>6</td>
<td>AWL word</td>
</tr>
<tr>
<td>expect</td>
<td>verb</td>
<td>4</td>
<td>K1 word</td>
</tr>
<tr>
<td>overwhelm</td>
<td>verb</td>
<td>6</td>
<td>Off-list word</td>
</tr>
<tr>
<td>knock out</td>
<td></td>
<td>4</td>
<td>K2 word</td>
</tr>
<tr>
<td>to the contrary</td>
<td></td>
<td>4</td>
<td>AWL word</td>
</tr>
<tr>
<td>settle down</td>
<td></td>
<td>4</td>
<td>K1 word</td>
</tr>
<tr>
<td>polish off</td>
<td></td>
<td>4</td>
<td>K2 word</td>
</tr>
<tr>
<td>insist on</td>
<td></td>
<td>4</td>
<td>AWL word</td>
</tr>
<tr>
<td>refer to</td>
<td></td>
<td>4</td>
<td>K2 word</td>
</tr>
<tr>
<td>for one's sake</td>
<td></td>
<td>4</td>
<td>K2 word</td>
</tr>
<tr>
<td>measure up to</td>
<td></td>
<td>4</td>
<td>K1 word</td>
</tr>
<tr>
<td>out of line</td>
<td></td>
<td>4</td>
<td>K1 word</td>
</tr>
<tr>
<td>hold out for</td>
<td></td>
<td>4</td>
<td>K1 word</td>
</tr>
</tbody>
</table>

K1 words: the first 1,000 most frequently used words of English; K2 words: the next 1,000 most frequently used words of English; AWL words: the academic words of English; Off-list words: the words not found in the first three frequency bands. The way to categorize the target forms is from VocabProfile English (see http://www.lextutor.ca/vp/eng/), a website/software to determine the frequency level of each word in an English text.
Unmodified input
The unmodified/baseline text was the original text without any modifications. This version of text with 1011 words was distributed to the participants in the control group, the interactionally modified input group, and the modified output group. The following paragraph is an excerpt from the unmodified text (see Example 1):

(1) Later, answering to criticism that he had overestimated the young prizefighter, Joe Johnson said, “Trust me; I knew what I was doing.” In the face of clear evidence to the contrary, Joe Johnson kept insisting on his dream. He was unable to give up the notion that Mike would succeed him as a champion that he would continue to hold the crown through his son.

Elaborated input
The baseline text was lexically elaborated for the participants in the elaborated input group and 1079 words were included (see Example 2). The researcher made use of the following three techniques to modify the target lexical items in the baseline text: (1) employing an explicit elaboration device (e.g., which means/is or or) plus the synonym after the target forms; (2) providing the synonym after the target forms with a comma in between; or (3) offering the synonym in the brackets after the target forms.

(2) Later, answering to criticism that he had overestimated the young prizefighter (professional boxer), Joe Johnson said, “Trust me; I knew what I was doing.” In the face of clear evidence to the contrary, or opposite to the fact, Joe Johnson kept insisting on his dream. He was unable to give up the notion or idea that Mike would succeed him as a champion that he would continue to hold the crown through his son.

Enhanced input
In the enhanced version of the text, the appearance of the target items have been altered by **boldfacing**, *italicizing*, and *underlining* to draw more attention of the participants on the target forms (see Example 3). Since no target form was removed from this version, the length of the passage was identical as the length of the unmodified text.

(3) Later, answering to criticism that he had overestimated the young **prizefighter**, Joe Johnson said, “Trust me; I knew what I was doing.” In the face of clear evidence **to the contrary**, Joe Johnson kept insisting on his dream. He was unable to give up the **notion** that Mike would succeed him as a champion that he would continue to hold the crown through his son.

3.4 Procedure
All the five groups of participants went through the same procedure: a preparing session, a treatment session, and a data-collecting session.

The preparing session
(a) A pretest, administered two days before the treatment (20 minutes).
The treatment session  
(b) A treatment, varied for the five groups (50 minutes for the modified output group and 45 minutes for other groups).

The data-collecting session  
(c) A posttest—a vocabulary recognition test, administered immediately after the treatment (20 minutes).

3.5 Testing instrument  
Koda (2005) proposed a three-category evaluating model of L2 vocabulary measures—assessing vocabulary as an integral aspect of general L2 proficiency, estimating vocabulary size, and measuring vocabulary depth. The first two categories were relevant to the objective of this study—assessing vocabulary recognition. The first category was frequently incorporated in traditional psychometric L2 proficiency tests and the purpose was to test an index of learners’ overall vocabulary knowledge. Simple multiple-choice format including synonym substitution was often employed. The second category provided numerical estimates of vocabulary size. Simple, easy-to-administered checklist format was applied to measure vocabulary knowledge through translations in learners’ native language.

The pretest  
In order to assess the general vocabulary size of the participants, the pretest was designed in the simple checklist format—the second category of Koda’s model. A list of 30 words and 15 expressions were selected from the unmodified text. The part of speech was given after each word. The participants were asked to read the list, check each item they recognized, and write down the Chinese meaning of each word and expression.

When the researcher performed the analysis of variance (ANOVA) on the participants’ scores of the pretest, no significant difference was found, $M = 9.1, F (4, 250) = 2.213, p > .05, \eta^2 = 0.013$. The analyses of the scores indicated that in general 79% of the tested items were not recognized by the participants. Based on the results of the pretest, 20 words and 10 expressions least known by the participants were chosen to be tested in the posttest. Subsequently, the subjects’ scores on the 30 target linguistic forms in the pretest were again submitted to the ANOVA. The results showed that the mean scores did not differ significantly across the five groups, $M = 3.12, F (5, 249) = 2.035, p > .05, \eta^2 = 0.022$, indicating no apparent differences among the five groups before the treatment.

The posttest  
The posttest was designed to measure the participants’ proficiency to recognize the target forms in the multiple-choice format—the first category of Koda’s model. The test included 30 statements and the participants were asked to make the best choice to replace the underlined target words and expressions. In order to ensure the accuracy, the statements were taken from Oxford Advanced Learner’s English-Chinese Dictionary. The technique of synonym substitution was employed to locate the keyed item and the synonyms were
different from the elaborations of the target forms in the elaborated input.

3.6 Treatment

The premodified input treatment
The researcher respectively provided the participants in the control group with the baseline texts, the elaborated input group with the elaborated texts, and the enhanced input group with the enhanced texts. The posttest was administered subsequently.

The interactionally modified input treatment
The participants in the interactionally modified input group were assigned into eight subgroups, six participants working together. The baseline texts and an MP3 with recording function were distributed to each subgroup. While reading, the participants were encouraged to interact with the researcher or their peers within the subgroup. The course of interaction was recorded within each subgroup and the posttest was administered subsequently.

The modified output treatment
The participants in the modified output group were assigned into nine subgroups, four participants working together. They were distributed the baseline texts and an MP3 with recording function. While reading, the participants were distributed a piece of paper with a list of the target forms. They orally composed a short sentence by using the lexical terms and exchanged their production with the partners. The process was recorded within each subgroup and the posttest was administered subsequently.

4. Results

The following two sections demonstrate how different types of comprehensible input influence the participants’ performance on the posttest, namely their incidental English vocabulary recognition.

4.1 Results of premodified input
Table 2 shows the descriptive statistic results for the immediate posttest when the two premodified input groups were compared with the control group. The control group obtained the lowest mean score, $M = 10.33$, $SD = 3.886$ while the enhanced input group obtained the highest mean score, $M = 14.93$, $SD = 3.505$. The participants in the elaborated input group and the enhanced input group outscored the control group and hence it implied that both elaborated input and enhanced input were beneficial to incidental English vocabulary recognition.
Levene’s test for homogeneity of variances showed a significant value of 0.024 for the immediate posttest. The ANOVA results demonstrated that there were significant differences amongst the mean scores of the three groups, $F(2, 134) = 17.045, p < .05, \eta^2 = 0.203$ (see Table 3).

<table>
<thead>
<tr>
<th>Table 3. ANOVA results of premodified input</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>Between Group</td>
</tr>
<tr>
<td>Within Group</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

SS: sum of squares; df: degree of freedom; MS: mean square; $F$: Fisher’s F ratio; $p$: significance probability; $p < .05$; $\eta^2$: the measure of the strength of relationship

The post hoc Scheffe test displayed the notably significant differences between the elaborated input group and the control group ($MD = 4.459$; see Table 4), and between the enhanced input group and the control group ($MD = 4.608$). Both premodified input groups outperformed the control group. It implied that both elaborated input and enhanced input notably affected the participants’ performance on the immediate posttest of vocabulary recognition with significant differences between either type and the baseline input.

<table>
<thead>
<tr>
<th>Table 4. Results of Scheffe test for premodified input</th>
</tr>
</thead>
<tbody>
<tr>
<td>UI</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>Group</td>
</tr>
<tr>
<td>Elaborated Input (ELI)</td>
</tr>
<tr>
<td>Enhanced Input (ENI)</td>
</tr>
</tbody>
</table>

$UI$: Unmodified Input; $MD$: mean difference; $* p < .05$

4.2 Results of comprehensible input

When elaborated input and enhanced input were considered as premodified input and when the three comprehensible input groups were compared with the control group, the descriptive statistics showed that the mean score of the modified output group was the highest on the immediate posttest ($M = 20.20, SD = 7.553$; see Table 5). Meanwhile,
the mean score of the control group was the lowest, $M = 10.33$, $SD = 3.886$. The results indicated that the participants in the comprehensible input groups outperformed those in the control group, and thereby proved the facilitative role of comprehensible input in incidental English vocabulary recognition.

### Table 5. Descriptive statistics for comprehensible input

<table>
<thead>
<tr>
<th></th>
<th>$n$</th>
<th>$M$</th>
<th>$SD$</th>
<th>95% Con. In.</th>
<th>Mini.</th>
<th>Maxi.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmodified Input</td>
<td>49</td>
<td>10.33</td>
<td>3.886</td>
<td>[9.21, 11.44]</td>
<td>2</td>
<td>19</td>
</tr>
<tr>
<td>Modified Output</td>
<td>35</td>
<td>20.20</td>
<td>7.553</td>
<td>[17.61, 22.79]</td>
<td>6</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>14.80</td>
<td>5.808</td>
<td>[14.03, 15.58]</td>
<td>2</td>
<td>28</td>
</tr>
</tbody>
</table>

$n$: the number of participants in the group; $M$: mean score; $SD$: standard deviation; Con. In.: confidence interval; Mini.: minimum; Maxi.: maximum

The ANOVA was performed again to determine whether there were significant differences across the four groups. Levene’s test for homogeneity of variances showed a significant value for the immediate posttest, indicating unequal variances. The ANOVA results displayed statistically significant differences among the mean scores of the four groups, $F (3, 216) = 27.002, p < .05, \eta^2 = 0.273$ (see Table 6).

### Table 6. ANOVA results of comprehensible input

<table>
<thead>
<tr>
<th></th>
<th>$SS$</th>
<th>$df$</th>
<th>$MS$</th>
<th>$F$</th>
<th>$p$</th>
<th>$\eta^2$</th>
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</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2015.190</td>
<td>3</td>
<td>671.730</td>
<td>27.002</td>
<td>.000</td>
<td>.273</td>
</tr>
<tr>
<td>Within Groups</td>
<td>5373.406</td>
<td>216</td>
<td>24.877</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>7388.595</td>
<td>219</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$SS$: sum of squares; $df$: degree of freedom; $MS$: mean square; $F$: Fisher’s $F$ ratio; $p$: significance probability; $p < .05$; $\eta^2$: the measure of the strength of relationship

Since the ANOVA results obtained a significant value of 0.000, the post hoc Scheffe test was performed again and the outcome supported the former results. A significant difference was shown between the control group and the premodified input group ($MD = 4.537$; see Table 7), and between the control group and the interactionally modified input group ($MD = 5.007$). In addition, the modified output group notably outscored its counterparts, especially the control group ($MD = 9.873$), followed by the premodified input group ($MD = 5.336$), and the interactionally modified input group ($MD = 4.867$). Therefore, it seemed that comprehensible input, especially modified output, significantly affected the participants’ performance on the immediate posttest of vocabulary recognition after the treatment.
Table 7. Results of Scheffe test for comprehensible input

<table>
<thead>
<tr>
<th>Group</th>
<th>UI MD</th>
<th>UI p</th>
<th>PI MD</th>
<th>PI p</th>
<th>IMI MD</th>
<th>IMI p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premodified Input (PI)</td>
<td>4.537*</td>
<td>.000</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Interactionally Modified Input (IMI)</td>
<td>5.007*</td>
<td>.000</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Modified Output (MO)</td>
<td>9.873*</td>
<td>.000</td>
<td>5.336*</td>
<td>.000</td>
<td>4.867*</td>
<td>.000</td>
</tr>
</tbody>
</table>

MD: mean difference; * p < .05

5. Discussion

5.1 Effects of premodified input on vocabulary recognition

The results showed that lexically elaborated input seems facilitate incidental English vocabulary recognition although its efficacy may be limited. The mean score of the elaborated group was higher than that of the control group on the posttest and there was a significant difference between the mean score of the elaborated input group and that of the control group on the posttest. The results are accordance with those of the most reviewed studies (Kim, 2003; Kong, 2007; Parker & Chaudron, 1987; Urano, 2002). Although the results of the current study are different from those of Brewer’s (2008), it seems hard to deny the positive effect of premodified input due to the different objectives of the two researches, lexical recognition for the current study and reading comprehension for Brewer’s study. The elaboratively modified text provides both exemplars and the explanations for the exemplars. When learners read the elaborated texts, they realize that there is a gap in their developing interlanguage system, and meanwhile they are able to gain the meanings of the target forms from the modifications. As a direct way to offer the meaning of the target forms, input elaborations make learners attend to the exemplars of the target words and expressions. In other words, the exposure to the elaborated input modifications draws learners’ attention and in the end enables them to access input processing.

In the treatment of the enhanced input group, even though the researcher did not explicitly instruct the participants to attend to the highlighted target forms, the participants significantly outscored those in the control group on the posttest. The results validate the supportive effects of enhanced input on L2 learners’ vocabulary recognition and further prove the results of Shook’s (1994) study that no matter whether the participants were given explicit instruction to pay attention to the enhanced target items, enhanced input facilitates L2 acquisition.

When learners read the enhanced passages, they tended to naturally pay attention to the highlighted target forms unknown to them. In order to understand the whole passage, they need to make efforts to figure out the meaning of the target forms from the context. Given that unknown words in unimportant positions were not crucial for the overall comprehension of the text, the participants might ignore difficult words such as *tyrannosaurus* (a word in the text but not one of the target linguistic items). However, they
may not neglect the word _immortality_ since it was highlighted in the passage. As a type of initially incomprehensible input, enhanced input may trigger learners’ recognition of the mismatches between their existing interlanguage system and that of the target language system, and further functions as a primary device that prepares itself for turning into apperceived input. Subsequently, apperceived input is comprehended by learners and finally it actualizes the recognition of the target forms.

This study validates the positive effects of both elaborated input and enhanced input on incidental English vocabulary recognition owing to the better performance of both input groups than the control group on the posttest. Elaborative modifications and textual enhancement cause learners to notice that there is something to be learned, and thereby promote the restructuring of their interlanguage system.

As for the comparative effects of elaborated input and enhanced input, the latter group obtained a higher mean score than the former group on the posttest, echoing Robinson and White’s (as cited in Combs, 2009) report that enhanced input shows a short-run instead of a long-term efficacy on L2 acquisition. Robinson (as cited in Doughty, 1991) stated that the processing of information from the working memory/short-term memory to the long-term memory involves two types of rehearsal, maintenance rehearsal and elaborative rehearsal, and the effects of maintenance rehearsal may lead to learners’ greater success on the immediate post-treatment tasks. The researcher of the current study suggests that compared with elaborated input, enhanced input functions more on maintenance rehearsal and therefore shows significantly effects on instant vocabulary recognition.

5.2 Effects of interactionally modified input on vocabulary recognition

The interactionally modified input group outperformed both the control group and the premodified input group on the posttest. The results support those of the reviewed studies (Ellis, 1995; Ellis, Tanaka & Yamazaki, 1994; Loschky, 1989; Pica, Doughty & Young, 1986; Van den Branden, 2000). Serving as a mechanism behind learners’ L2 development, interactional modifications enable learners to notice the troublesome parts of the input—the target words and expressions that they were not familiar with beforehand, offer them opportunities to negotiate the meanings of the target items, and thus provide learners with information which may have access to interlanguage modifications.

Since the experiment-process has been monitored and recorded by the researcher, it was found that most of the interaction occurred in the interactionally modified input treatment were the negotiation on the meaning of the words unknown. During the negotiation, learners received more usable input in their quest to understand the target forms through clarification or elaboration of the message, and this orally elaborated input draws attention to interlanguage features that diverge from the target language. It is the realization of divergence between one’s existing L2 forms and target language forms that becomes the vehicle for learning (Gass, Mackey & Pica, 1998: 301). The modifications to learners’ interlanguage system may promote the development of the target language and lead to subsequent lexical recognition.

Compared with premodified input, internationally modified input works more on
maintenance rehearsal and has better effects on the instant memory of the participants due to the higher mean score of the interactionally modified input group on the posttest. In brief, interactionally modified input results in better retention of the target forms.

5.3 Effects of modified output on vocabulary recognition

The modified output group significantly outperformed other groups, especially the control group, on the posttest. It seems that pushed output increases learners’ control over the target terms. The results are identical with those of studies conducted by Nobuyoshi and Ellis (1993), Ellis and He (1999), and Van den Branden (2000).

Modified output facilitates L2 vocabulary recognition owing to noticing function and the role of word-focused tasks. Modified output leads to L2 learners’ noticing on the mismatch between their own production and the target forms. When learners attempt to convey message and are confronted with linguistic problems, they become aware of the deficiencies in their existing interlanguage system. Schmidt (1990) has refined the concept of the term noticing to account for interlanguage development which is not necessarily conscious but does require attention. Any sort of reformulation of an incorrect utterance could draw a learner’s attention to the incorrectness and thereby trigger the learner’s internal mechanisms, which may in turn result in the learner’s immediate output change. Due to the highest mean score of the modified output group on the posttest, the researcher suggests that the participants who notice the language gap most are those who develop the target language most.

On the other hand, Laufer and Yano (2001: 44) stated that “in order to acquire a word without attempting to commit it to memory, word-focused activities are recommended”. The participants in the modified output group participated in the word-focused tasks, and as a result they outperformed their counterparts on the posttest. From the theoretical point of view, the vocabulary enhancement activity serves as a device that guides learners to engage in certain types of input-processing, which is important for effective language use and for language acquisition. Therefore, reading combined with word-focused activities may result in better gains in L2 vocabulary knowledge. The results of this study show that reading with word-focused activities is superior to reading for comprehension only regardless of whether the reading materials are premodified, and learners involved in productive word-focused tasks are more likely to recall words.

Similar to enhanced input, modified output functions more on maintenance rehearsal than both premodified input and interactionally modified input. Learners in the modified output group tend to memorize more words immediately after the treatment. In summary, modified output shows a more significantly short-run efficacy on incidental L2 vocabulary recognition.

6. Conclusion

Due to the fact that the mean scores of the comprehensible input groups were prominently higher than the mean score of the control group on the posttest, it implies that all types of
comprehensible input—elaborated input, enhanced input, interactionally modified input, and modified output—may facilitate incidental English vocabulary recognition.

In summary, comprehensible input may positively influence incidental English vocabulary recognition based on the role of selected attention or noticing in L2 acquisition. Sharwood-Smith (1993) once stated that the effects of focusing learners’ attention to specific aspects of input can lead to further cognitive processing. The results of the current study show that different types of comprehensible input function in the following way: (a) premodified input calls L2 learners’ attention and generates the selected input transiently registered in L2 learners’ short-term memory due to the salient features of the target forms; (b) interactionally modified input provides learners with an opportunity to negotiate the previously unknown data and thus engenders input processing; and (c) modified output triggers a restructuring of learners’ existing language system. The researcher suggests that modified output improves L2 instant vocabulary recognition the most, followed by interactionally modified input and premodified input.

Although the design of the experiment has been revised for several times, it still consists of a few unexpected factors which may influence the results. If the baseline text were not taken from a textbook, other target linguistic forms were chosen, the modifications were designed into other forms, or the participants were offered a delayed posttest after a period of time, the results of the study would be changed. Therefore, the researcher of the current study expects that the future researches investigate the relationship between comprehensible input and L2 acquisition, and explore the role of noticing in L2 acquisition.

References


(Copy editing: Ian Hunter)