This study investigates the effects of receptive and productive vocabulary tasks on learning collocation and meaning. Japanese English as a foreign language students learned target words in three glossed sentences and in a cloze task. To determine the effects of the treatments, four tests were used to measure receptive and productive knowledge of collocation and meaning. The results showed that both tasks led to significant gains in knowledge with little difference between the size of the gains. When participants were grouped according to level, the productive task was more effective for higher level learners, and the receptive task was more effective for lower level learners. Mean scores on the productive tests were slightly higher for both tasks on the test of meaning than on the test of collocation. However, the findings indicate knowledge of collocation may be acquired at a rate similar to that of meaning, and that tasks which focus on collocation, as well as meaning, may be effective.

The importance of knowledge of collocation to second language learners is now widely recognized (Bahns & Eldaw, 1993; Howarth, 1998; Lewis, 2000; McCarthy & O’Dell, 2005; Nesselhauf, 2003). Although viewed initially as a tool through which to develop higher level productive skills in advanced learners, the benefits of learning collocations are now seen as extending beyond mere word selection to include fluency development as well as improvements in accuracy (Wray, 2000). With multiple benefits to be gained, it is hardly surprising that there has been increased interest in the role of collocations in the classroom and demands for a more explicit and prominent place to be given to their teaching within academic curriculums (Hill, 2000; Kennedy, 2003; Lewis, 2000). Despite widespread recognition of the difficulties learners have in producing collocations and their critical role in fluency development, however (Bahns & Eldaw, 1993; Gabrys-Biskup, 1992; Nesselhauf, 2003),
very few empirical studies have addressed the issue of how collocations can be most effectively taught in the language classroom. In order to shed some light on this issue, the current study investigates three main areas concerning the teaching of collocation in the language classroom: (a) the extent to which reading and cloze tasks are effective tools for explicitly teaching collocation, (b) the influence of the type of learning condition (receptive or productive) on the ultimate learning gains, and (c) the general nature of the relationship between collocation and meaning. By addressing these three fundamental areas, we hope to deepen our understanding of how collocations are learned and provide empirical support for the most effective means of teaching collocation in the language classroom.

BACKGROUND

The majority of research investigating collocations to date has focused on providing descriptive accounts of collocational behaviour and analyses of how collocations are used by learners in the second language (L2) classroom. The increased availability of large corpora has enabled corpus linguists to examine more closely the precise nature of different types of collocation, and several studies have been carried out to determine their relationship with other multiword lexical units (Moon, 1997, 1998), their structural and functional properties (Mel’cuk, 1998; Nesselhauf, 2005; Wouden, 1997), and the grammatical and semantic constraints on co-occurrence (Kennedy, 2003; Xiao & McEnery, 2006).

Most research carried out within the L2 classroom has also been largely descriptive in nature, concerned primarily with assessing the extent of learner knowledge of collocation and its influence on learner errors (Bahns & Eldaw, 1993; Farghal & Obiedat, 1995; Granger, 1998; Nesselhauf, 2003). Initial studies using small elicitation tests such as cloze and translation tasks found that collocation was highly problematic for L2 learners and that it accounted for a significantly high proportion of learner errors in L2 writing (Bahns & Eldaw, 1993; Gabrys-Biskup, 1992; Hussein, 1990). These results were then confirmed by further studies based on larger amounts of freely produced data such as essays and reports, which again showed that collocation, in particular with a verb–noun form, was responsible for a significant number of learner errors (Granger, 1998; Nesselhauf, 2003). Based on these findings, it would seem that collocation is indeed an area of particular difficulty for many L2 learners, warranting further attention and a more prominent role within L2 classrooms.

The necessity to introduce collocation explicitly into the L2 classroom receives further support from the suggestion by some researchers that the majority of words are learned through direct instruction with
relatively few gains being made incidentally in an EFL context (Laufer, 1991; Laufer & Paribakht, 1998). Although it has been argued that collocation may be learned incidentally along with the meaning of single-word items (Mackin, 1978), research on vocabulary learning in an EFL context indicates that incidentally acquiring meaning for even relatively salient single-word items is a relatively slow process with learning dependent on the amount of input (Horst, Cobb, & Meara, 1998; Waring & Takaki, 2003). If this is the case, then learning collocation incidentally may be a rare occurrence because the number of words that would be needed to encounter the same collocation twice would be much greater than those needed to encounter the same word twice, and research indicates that at least eight encounters are needed to learn a word’s meaning (Horst, Cobb, & Meara; Waring & Takaki; Webb, 2007a). Indeed, the lack of incidental learning would seem to be reflected in reports claiming a large gap between knowledge of meaning and collocation (Bahns & Eldaw, 1993), and indicates a need to determine the most effective methods through which to teach collocation.

Although the problems that learners have in producing collocations and collocations’ critical role in fluency development are widely recognized, very few empirical studies have addressed the issue of how collocations can be most effectively taught in the language classroom. Several researchers have made suggestions toward teaching approaches (Hill, 2000; Lewis, 2000; McCarthy & O’Dell, 2005), but there is little empirical support for effective ways of teaching collocation. Of the few studies which do specifically address the issue of teaching collocation in the classroom, most are concerned with the use of computer-aided language learning (CALL) facilities—in particular Web-based concordancers. Sun and Wang (2003) used a concordancer program to examine the relative effectiveness of inductive and deductive approaches to learning grammatical collocations at two levels of difficulty in the classroom. The researchers randomly divided a group of 81 senior high school students into two groups and asked them to complete an hour-long instruction session of online exercises for four target collocations that used either a deductive or inductive teaching approach. The four target collocations were divided into two groups based on perceived difficulty. The deductive group received rule explanations with example sentences, and the inductive group had to induce the patterns using a concordancer. Posttest results showed that the inductive group improved significantly more than the deductive group in learning collocation as demonstrated by an error correction test. The level of difficulty of collocation was also found to influence the learning outcome with easy collocations being more suitable for an inductive approach. As noted by Chan and Liou (2005), however, the design of the study had several weaknesses, including the small sample size of collocations and the arbitrary nature with which the
collocations were divided into levels of difficulty. Although the results shed some light on the teaching of collocation under different learning conditions, limitations in the study design cast doubt as to how generalizable the results may be.

In a follow-up study, Chan and Liou (2005) also investigated the effects of Web-based concordancing on collocation learning in a CALL classroom. The study used five Web-based practice units, three of which included the use of a bilingual Chinese–English concordancer to teach verb–noun collocations to EFL students. In line with Sun and Wang’s (2003) results, they also found that explicit online instruction was effective in promoting EFL learner knowledge of collocation, with results significantly higher for units in which the concordancer had been used. Results also showed significant differences in learning between four verb–noun collocation types with concordancers deemed most suitable for use in the instruction of delexicalised verbs and L1–L2 noncongruent verb collocations. Although the study design included a wide variety of interactive activities such as multiple-choice and gap-filling tasks within the online practice units, the research questions focused on the learning effects of the concordancer alone, and no discussion was made of how the different types of activities may have affected different types of learning gains. Indeed, overall gains in knowledge of collocation were assessed by the use of a single productive test—albeit at delayed intervals—making any further analysis of task type largely impossible.

Although a limited number of studies have included different tasks within the research design, to our knowledge none to date have specifically addressed the issue of how different learning conditions, such as those found in receptive and productive tasks, may influence knowledge of collocation. Research investigating learning word pairs has shown that the type of learning (receptive or productive) may determine the amount of knowledge gained, with receptive tasks more likely to result in gains in receptive knowledge and productive tasks likely to foster productive gains (Griffin & Harley, 1996; Stoddard, 1929; Waring, 1997b). This result may depend, however, on the time spent on the tasks (Webb, 2005). Productive tasks tend to take longer than receptive tasks (Waring, 1997b; Webb, 2005). Webb found that when time on task was the same, a reading task was more effective than a writing task. However, when time on task was not controlled, the productive task was more effective. Little is known, however, of how such differences in task type affect ultimate learning gains for longer multiword lexical units. Having drawn considerable interest from researchers investigating the acquisition of single word items, it is surprising that this area of research seems to be as yet largely unexplored.

Another area largely unaddressed by current studies of collocation is that of the relationship between collocation and form and meaning. It is now widely accepted that knowing a word requires a depth of knowledge
which extends beyond mere form and meaning, and several researchers have outlined criteria for which aspects of knowledge are required to know a word (Aitchison, 1994; Laufer, 1997; McCarthy, 1990; Nation, 1990, 2001; Richards, 1976). Though collocation is widely cited as one of several aspects of knowledge, very little is known about the precise relationship between the aspects of knowledge and how they interact. Aside from a handful of studies conducted on the multiple aspects of word knowledge (Schmitt, 1998, 1999; Schmitt & Meara, 1997; Webb, 2005, 2007a, 2007b, 2008), there is little research focused on issues such as the rate of acquisition of different aspects, to what extent they can be learned independently, and how much of a tradeoff is necessary to successfully acquire depth as well as breath of vocabulary knowledge. Although addressing all these questions is obviously beyond the scope of the current study, we hope that by carrying out multiple tests for receptive and productive gains in both collocation and meaning, the current study will shed some light on the relationship between these two aspects of word knowledge.

RESEARCH QUESTIONS

The current study seeks to address the following three research questions:

1. To what extent are reading and cloze tasks effective as tools for explicitly teaching collocation in the language classroom?

2. In what ways do the differences in the type of learning condition (receptive and productive) influence learning gains in receptive and productive knowledge of collocation and meaning?

3. What do the results show us about the nature of the relationship between collocation and meaning?

For the purpose of this study, collocation will be defined from a statistical (Greenbaum, 1974; Hunston, 2002; Partington, 1998; Sinclair, 1991) rather than a phraseological (Cowie, 1994; Nesselhauf, 2003) standpoint as referring to the frequency of co-occurrence of two lexical items within a given span. This definition has been widely accepted by corpus linguists such as Halliday (1966), Sinclair (1991), and McEnery and Wilson (2001).

METHOD

Participants

The participants in this study were 145 Japanese native speakers learning English as a foreign language in nine first-, second-, and third-year classes at
two universities in Fukuoka, Japan. Their average raw score on Version 1 of the Vocabulary Levels Test (Schmitt, 2000) at the second-1,000-word level was 24.8/30, indicating that they had receptive knowledge of approximately 1,700 of the 2,000 most frequent words (Schmitt, Schmitt, & Clapham, 2001), and they should have little difficulty understanding all of the running words in the treatments. The two experimental groups were assigned 117 participants—encountering collocations in three glossed sentences and writing the same collocations in a cloze task—and 28 participants were assigned to a control group, which did the pretest and the receptive knowledge of collocation posttest. Of all the learners in the study, 62 were classified as higher level learners. Their average raw score on the pretest was 5.26/24, and their average raw score on the second-1,000-word level was 27.0/30. In addition, 55 learners were classified as lower level learners. Their average raw score on the pretest was 2.96/24, and their average raw score on the second-1,000-word level was 24.7/30. To ensure that there was a valid comparison between the two treatments, the participants were assigned to the experimental groups according to their pretest scores. The reading and cloze groups, and their subgroups—higher level and lower level—all had statistically equivalent scores on the pretest (see Tables 2–5).

Design

Three weeks before the experiment, all of the participants were administered the pretest and given as much time as they needed to complete it. The learners were then assigned to two experimental groups and one control group. In the receptive treatment, the first experimental group encountered target collocations in three glossed sentences. In the productive treatment, the second experimental group had to write the target collocations in blanks in the same three sentences that the first experimental group read. The control group simply completed the posttest measuring receptive knowledge of collocation. In the experiment, which was conducted within one 90-minute class, the experimental groups completed the treatments and posttests. The participants were given as much time as they needed to complete the treatments and were monitored to ensure that the treatments had been completed. Immediately after the treatments, the posttests were handed out. The participants were unaware that they would be tested after the treatments and had as much time as they needed to complete the tests.

Target Collocations

Twenty-four collocations were chosen for this experiment. The node word in each collocation was a verb with a noun as its collocate.
Verb–noun collocations were used in this study because previous research has indicated that they have caused difficulty for EFL learners (Chan & Liou, 2005; Nesselhauf, 2003). All of the collocations were comprised of high-frequency words that the participants were likely to know. The collocations and their $t$-scores taken from the Bank of English are reported in Table 1.

**Treatments**

In the receptive treatment (see Appendix), the participants encountered each collocation along with its first language (L1) meaning followed by three sentences. The instructions were written in Japanese and were as follows: “Try to understand the words in bold and the sentences in which they appear.” In Example 1 the glossed sentences for the target collocations *lose touch* are shown.

**Example 1**

\begin{itemize}
\item lose touch = 音信不通になる
A lot of famous people **lose touch** with their old friends.
Mick does not want to **lose touch** with his children.
We mustn’t **lose touch** with our family.
\end{itemize}

In the productive treatment, the participants encountered the collocations in the identical glossed sentences listed in the receptive treatment. However, in each sentence the collocations had been replaced with blanks. The instructions were written in Japanese and were as follows: “Try to understand the words in bold and the sentences below. Write the words in bold in the blanks.” To reduce the amount of time it took to complete the cloze task, the participants had to decide between two

<table>
<thead>
<tr>
<th>Collocation</th>
<th>$t$-score</th>
<th>Collocation</th>
<th>$t$-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>touch wood</td>
<td>12.05</td>
<td>sit exams</td>
<td>10.28</td>
</tr>
<tr>
<td>stay course</td>
<td>10.56</td>
<td>pull strings</td>
<td>11.86</td>
</tr>
<tr>
<td>buy time</td>
<td>5.44</td>
<td>draw blood</td>
<td>6.87</td>
</tr>
<tr>
<td>run risk</td>
<td>26.62</td>
<td>meet demand</td>
<td>28.39</td>
</tr>
<tr>
<td>throw light</td>
<td>15.54</td>
<td>grant wish</td>
<td>5.55</td>
</tr>
<tr>
<td>give example</td>
<td>19.30</td>
<td>cut corners</td>
<td>15.55</td>
</tr>
<tr>
<td>spread word</td>
<td>24.25</td>
<td>shoot film</td>
<td>9.62</td>
</tr>
<tr>
<td>see light</td>
<td>19.88</td>
<td>lose touch</td>
<td>13.48</td>
</tr>
<tr>
<td>read thoughts</td>
<td>8.38</td>
<td>raise questions</td>
<td>26.04</td>
</tr>
<tr>
<td>blow nose</td>
<td>10.08</td>
<td>launch attacks</td>
<td>13.31</td>
</tr>
<tr>
<td>remember time</td>
<td>22.24</td>
<td>ensure safety</td>
<td>21.86</td>
</tr>
<tr>
<td>tell time</td>
<td>8.20</td>
<td>develop strategies</td>
<td>14.55</td>
</tr>
</tbody>
</table>
collocations for each set of three sentences. The participant’s task was to write the two collocations in the correct set of three sentences. Twelve sets of two collocations and their sentences were presented in the test. After the cloze task had been completed, the participants were given an answer sheet which showed the correct collocation beside the appropriate number to ensure that their responses were correct. The participants were not shown the meanings of the collocations or the collocations in their contexts on the answer sheet. The participants were monitored to ensure that they wrote the collocations in each sentence. In Example 2, the cloze task for the collocations *lose touch* and *meet demand* are shown.

**Example 2**

[A lot of famous people ______ ______ with their old friends.]

A) Mick does not want to ______ ______ with his children.
   We mustn’t ______ ______ with our family.

B) This is the only way the club can ______ the ______ for tickets from supporters.
   Railways were built to ______ a clear ______ to move people.
   This will allow us to ______ the public’s ______ for manufactured goods.

All of the sentences in which the collocations were encountered were taken from the Bank of English or the British National Corpus; however, many of the sentences were modified. Running words that were unlikely to be known were replaced with more frequent words, which were expected to be known by all of the participants. Because the percentage of unknown words in a text is likely to influence learning (Laufer, 1989; Nation, 2001), using sentences in which all of the running words were likely to be known would provide a more accurate assessment of the learning conditions.

**Dependent Measures**

A pretest measuring receptive knowledge of collocation was used to select collocations the participants were unlikely to know. The pretest used a multiple-choice format in which the node word for each collocation was given and the participants were required to circle the correct collocate from four choices or circle a fifth choice, *I don’t know*, if they were unsure. All of the distracters were among the 2,000 most frequent
words and were likely to be known by all of the participants. In Example 3, the learners had to circle *touch* to score correctly.

**Example 3**

lose  a) touch  b) surprise  c) trouble  d) peace  e) I don’t know

After the treatments, the learners were administered four tests that measured productive knowledge of collocation, receptive knowledge of collocation, productive knowledge of meaning, and receptive knowledge of meaning. Two scores were calculated for the tests measuring productive knowledge of collocation and meaning for all of the participants. One score was for partial knowledge of written form, and one score was for full knowledge of written form. Using scores for partial and full knowledge of written form may provide a more accurate assessment of the effects of the treatments on productive knowledge.

On the first test, which measured productive knowledge of collocation, the participants were given the node words from the target collocations and had to write the collocates, which they had learned in the treatment. To score correctly in Example 4, the learners had to write the target collocate *touch* beside the node word *lose* with which it had appeared in the treatment.

**Example 4**

lose ___________________

If a response was misspelled and it resembled the target collocate, was singular when it should have been plural, plural when it should have been singular, or the wrong part of speech, it was marked as incorrect in the strict scoring system. In the example above, for the target collocation *lose touch*, responses such as *tuch, touches, and touching* were scored as incorrect. However, those responses were marked as correct in the sensitive scoring system, which scored for partial knowledge.

The second test was a multiple-choice test measuring receptive knowledge of collocation. The test was identical to the pretest discussed earlier except the number of target collocations had been reduced to the 24 which were learned in the experiment.

The third test was a productive-translation test in which the L1 meanings cued the L2 collocations. The aim of this test was to determine whether the learners could link the L2 collocations with their L1 meanings. To score correctly in Example 5, the learners had to write the collocation *lose touch* beside its L1 translation.

**Example 5**

音信不通になる ___________________
Each response was scored twice. In the strict scoring system, the answer had to be spelled correctly. In the sensitive scoring system, misspelled responses which clearly resembled the correct answer and were not real words were also scored as correct.

The fourth test was a receptive translation test in which the L2 collocations cued the L1 meanings. In Example 6, the learners were required to write the Japanese translation of *lose touch* (非常不適になる) in the blank.

**Example 6**

(4) lose touch ____________________

Since the participants saw all of the L1 meanings in the previous test, it may have created a slight learning effect. However, it should be noted that the test was essentially measuring the participant’s ability to link the collocations with their L1 meanings, rather than demonstrate that they knew the L1 meanings. To reduce the possibility of a learning effect, the order in which the collocations were listed varied on each test.

**RESULTS**

The descriptive statistics (means, standard deviations, and number of participants) of the scores for the tests measuring receptive knowledge of collocation are reported in Table 2. Figure 1 shows that the reading group’s mean score increased from 4.25 to 19.70 after the treatment, and the cloze group’s mean score increased from 4.11 to 20.84. To determine the effects of the learning conditions (reading three glossed sentences or completing a cloze task), Welch’s robust test for differences in group means was performed using the change scores (post-pre score) on tests measuring receptive knowledge of collocation for all three groups.1 The Welch test revealed that the three groups differed in terms of improvement $F(2, 91.24) = 329.94, p < 0.001$. A posthoc, Tukey

<table>
<thead>
<tr>
<th>Learning condition</th>
<th>Tests</th>
<th>Reading (n = 56)</th>
<th>Cloze task (n = 61)</th>
<th>Control (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receptive collocation pretest</td>
<td>4.25, 2.55</td>
<td>4.11, 3.02</td>
<td>5.43, 2.20</td>
<td></td>
</tr>
<tr>
<td>Receptive collocation posttest</td>
<td>19.70*, 4.43</td>
<td>20.84*, 3.72</td>
<td>6.14, 2.49</td>
<td></td>
</tr>
</tbody>
</table>


* Significant difference between pretest and posttest score ($p < 0.05$).

1Because Levene’s test rejected the assumption of equal variances, Welch’s robust test was used rather than a regular ANOVA (Welch, 1951).
multiple-comparison test showed that the reading group and the cloze group improved their scores significantly more than the control group ($p < 0.05$), indicating that both learning tasks were effective methods of learning collocation. However, the difference between the reading and cloze groups was not statistically significant ($p = 0.23$), indicating that neither treatment was superior at developing receptive knowledge of collocation. The difference between the pretest and posttest for the control group was not significant ($p > 0.05$).

The descriptive statistics (means, standard deviations, and number of participants) of the scores for all the dependent measures are presented in Table 3. The results show that both groups demonstrated large gains in knowledge with very little difference between the scores for both groups. A multivariate analysis of variance (MANOVA) was performed, using the scores on the five dependent measures with each productive test scored twice (strict and sensitive scoring). The independent variable was the type of learning task—completing a cloze task and reading the collocations in three sentences. The MANOVA revealed an overall significant difference between the two tasks ($F(7, 109) = 2.58, p < 0.05$). However, no significant differences were found between the two tasks on any of the individual tests.

Table 4 presents the results for the higher level students on the dependent measures. Repeated measures analyses of variance (ANOVAs) revealed that both the reading group ($F(1, 29) = 220.67, p < 0.001$) and the cloze group ($F(1, 31) = 428.62, p < 0.001$) had significantly higher scores on the posttest measuring receptive knowledge of collocation than on the pretest, indicating that the learning conditions were effective with
the higher level learners. A MANOVA revealed an overall significant difference between the two tasks ($F(7, 54) = 3.45, p < 0.01$). Table 4 shows that the participants who completed the cloze task outperformed those who completed the reading task on all of the tests. The cloze group had significantly higher scores on the tests measuring productive collocation ($F(1, 61) = 4.29, p < 0.05$), productive collocation with strict scoring ($F(1, 61) = 7.19, p < 0.01$), receptive collocation ($F(1, 61) = 8.88, p < 0.01$), productive meaning ($F(1, 61) = 5.42, p < 0.05$), and productive meaning with strict scoring ($F(1, 61) = 7.24, p < 0.01$). There were no significant differences between the groups on the pretest ($F(1, 61) = 2.14, p = 0.148$) or on the test measuring receptive knowledge of meaning ($F(1, 61) = 0.394, p = 0.533$).

Table 5 presents the results for the lower level students on the dependent measures. Two repeated measures ANOVAs revealed that both the reading group ($F(1, 25) = 647.07, p < 0.001$) and the cloze group ($F(1, 28) = 528.66, p < 0.001$) had significantly higher scores on the posttest measuring receptive knowledge of collocation than on the pretest,

### Table 3

<table>
<thead>
<tr>
<th>Learning condition</th>
<th>Tests</th>
<th>Reading ($n = 56$)</th>
<th>Cloze task ($n = 61$)</th>
<th>KR21 ($n = 117$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receptive collocation pretest</td>
<td>4.25, 2.55</td>
<td>4.11, 3.02</td>
<td>0.58073117</td>
<td></td>
</tr>
<tr>
<td>Productive collocation</td>
<td>9.04, 5.80</td>
<td>8.36, 5.75</td>
<td>0.86930298</td>
<td></td>
</tr>
<tr>
<td>Productive collocation (strict scoring)</td>
<td>7.18, 5.43</td>
<td>7.23, 5.24</td>
<td>0.85655931</td>
<td></td>
</tr>
<tr>
<td>Receptive collocation</td>
<td>19.70, 4.43</td>
<td>20.84, 3.72</td>
<td>0.84842607</td>
<td></td>
</tr>
<tr>
<td>Productive meaning</td>
<td>12.86, 5.89</td>
<td>12.34, 5.57</td>
<td>0.85172691</td>
<td></td>
</tr>
<tr>
<td>Productive meaning (strict scoring)</td>
<td>10.82, 5.60</td>
<td>10.59, 5.42</td>
<td>0.83773023</td>
<td></td>
</tr>
<tr>
<td>Receptive meaning</td>
<td>18.73, 3.40</td>
<td>17.67, 4.83</td>
<td>0.78556754</td>
<td></td>
</tr>
</tbody>
</table>


### Table 4

<table>
<thead>
<tr>
<th>Learning condition</th>
<th>Tests</th>
<th>Reading ($n = 30$)</th>
<th>Cloze task ($n = 32$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receptive collocation pretest</td>
<td>4.83, 2.26</td>
<td>5.66, 2.16</td>
<td></td>
</tr>
<tr>
<td>Productive collocation</td>
<td>6.87, 4.42</td>
<td>9.47*, 5.38</td>
<td></td>
</tr>
<tr>
<td>Productive collocation (strict scoring)</td>
<td>5.10, 3.76</td>
<td>8.19**, 5.15</td>
<td></td>
</tr>
<tr>
<td>Receptive collocation</td>
<td>18.43, 4.72</td>
<td>21.59**, 3.58</td>
<td></td>
</tr>
<tr>
<td>Productive meaning</td>
<td>11.20, 5.82</td>
<td>14.44*, 5.13</td>
<td></td>
</tr>
<tr>
<td>Productive meaning (strict scoring)</td>
<td>9.20, 5.09</td>
<td>12.63**, 4.94</td>
<td></td>
</tr>
<tr>
<td>Receptive meaning</td>
<td>19.03, 3.57</td>
<td>19.59, 3.46</td>
<td></td>
</tr>
</tbody>
</table>

* Significantly higher score ($p < 0.05$). ** Significantly higher score ($p < 0.01$).
indicating that the learning conditions were effective for the lower level learners. A MANOVA revealed an overall significant difference between the two tasks ($F(7, 47) = 2.57, p < 0.05$). In contrast to the results for the higher level learners, Table 5 shows that the lower level learners who had completed the reading task had higher scores on all of the tests. The reading group had significantly higher scores on the tests measuring productive collocation ($F(1, 54) = 7.09, p < 0.01$), productive collocation with strict scoring ($F(1, 54) = 4.98, p < 0.05$), productive meaning ($F(1, 54) = 10.85, p < 0.01$), productive meaning with strict scoring ($F(1, 54) = 8.96, p < 0.01$), and receptive meaning ($F(1, 54) = 5.60, p < 0.05$). There were no significant differences between the groups on the pretest ($F(1, 54) = 2.29, p = 0.136$) or on the test measuring receptive knowledge of collocation ($F(1, 54) = 1.34, p = 0.252$). All statistical analyses were performed using the SPSS v10.1 package (SPSS, 2000).

**DISCUSSION**

The results of the current study indicate that both tasks—reading three glossed sentences and completing a cloze exercise—were very effective methods of learning collocation. The experimental design expanded on earlier methodologies, measuring both receptive and productive gains in knowledge of collocation and meaning, and measuring productive gains at two levels of sensitivity, allowing a more accurate assessment of the tasks. Mean scores on the test measuring receptive knowledge of collocation increased from 4.25 on the pretest for the reading group to 19.7 on the posttest. The cloze group made similar gains, scoring 4.11 on the pretest and 20.84 on the posttest. Combined, the results show that the groups were able to increase their receptive knowledge of the target collocations from 17% to 85%. On the productive knowledge of collocation test, learners in the reading group were able to demonstrate that they knew

<table>
<thead>
<tr>
<th>Learning condition</th>
<th>Receptive collocation pretest</th>
<th>Reading ($n = 26$)</th>
<th>Cloze task ($n = 29$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.58, 2.73</td>
<td>2.41, 2.95</td>
<td></td>
</tr>
<tr>
<td>Productive collocation</td>
<td>11.54**, 6.26</td>
<td>7.14, 5.99</td>
<td></td>
</tr>
<tr>
<td>Productive collocation (strict scoring)</td>
<td>9.58*, 6.10</td>
<td>6.17, 5.22</td>
<td></td>
</tr>
<tr>
<td>Receptive collocation</td>
<td>21.15, 3.62</td>
<td>20.00, 3.75</td>
<td></td>
</tr>
<tr>
<td>Productive meaning</td>
<td>14.77**, 5.47</td>
<td>10.03, 5.19</td>
<td></td>
</tr>
<tr>
<td>Productive meaning (strict scoring)</td>
<td>12.69**, 8.34</td>
<td>8.34, 5.10</td>
<td></td>
</tr>
<tr>
<td>Receptive meaning</td>
<td>18.38*, 3.24</td>
<td>15.55, 5.28</td>
<td></td>
</tr>
</tbody>
</table>

*Significantly higher score ($p < 0.05$). **Significantly higher score ($p < 0.01$).
38% of the collocations in the sensitive scoring system and 30% when the responses had to be spelled correctly. The cloze group had similar scores of 35% in the sensitive scoring system and 30% in the strict scoring system on the productive test of collocation. Although the scores on the productive tests were lower than those on the receptive tests, the findings are supported by earlier research which has repeatedly shown that receptive knowledge of meaning is easier to gain than productive knowledge of meaning (Morgan & Oberdeck, 1930; Stoddard, 1929; Waring, 1997a, 1997b; Webb, 2005).

When learners were grouped according to level, significant gains were found for both groups at each level. The lower level reading group knew 15% of the collocations on the pretest and 88% on the receptive knowledge of collocation posttest. Similarly, the lower level cloze group knew 10% of the collocations on the pretest and 83% on the posttest. The higher level reading group demonstrated knowledge of 20% of the collocations on the pretest and 77% on the receptive collocation posttest, and the higher level cloze group demonstrated knowledge of 24% of the collocations on the pretest and 90% on the posttest. The findings indicate that the tasks may be effective for gaining knowledge of collocation for learners at varying levels.

Overall, the scores on the tests measuring collocation indicate that reading glossed sentences and completing a cloze task may both be effective and efficient methods of learning collocation. The results support previous studies which showed significant gains in knowledge of collocation through explicit teaching with online practice units and concordancers (Chan & Liou, 2005; Sun & Wang, 2003) and indicate that gains through explicit teaching may be similar for both CALL and regular classroom settings. Because it appeared from the large percentage of incorrect responses on the pretest that most of the participants were guessing when they did not know an answer rather than selecting the I don’t know response, it is likely that gains may have actually been larger than were found in this study. In fact, it may also have been possible to increase the effects of the tasks by using target collocations without semantic and phonological relationships (Higa, 1963). In their study, Chan and Liou (2005) found significant differences in learning between four different types of verb–noun collocations. In the current study, the similarity between the collocations remember time, tell time, and buy time, as well as see light and throw light, may have reduced the size of learning gains.

Another purpose of this study was to investigate the relative effectiveness of the reading and cloze tasks. Earlier vocabulary acquisition studies have found that productive learning of word pairs tends to be more effective than receptive learning of word pairs at increasing productive knowledge of meaning, and the receptive task is more effective than the
productive task at contributing to receptive knowledge of meaning (Griffin & Harley, 1996; Stoddard, 1929; Waring, 1997b). The results of the current study, however, indicate that there was little difference between the effects of the receptive and productive tasks on knowledge of collocation and meaning. Though the two tasks contributed to large gains in knowledge, the mean scores were surprisingly similar, with no significant differences found between the tasks on any of the tests.² One reason for this result may be that the productive task was not very difficult. Perhaps a more demanding cloze task or a sentence production task would have contributed to greater gains in productive knowledge. When the participants were grouped according to level, however, the results were quite different. With the higher level learners, the cloze group had significantly higher scores on all of the posttests except for receptive knowledge of meaning. Conversely, with the lower level learners, the reading group had significantly higher scores on all of the posttests, except for receptive knowledge of collocation.

There may be three reasons for the difference in results between the two levels. First, the increased demands of the cloze task may not have caused any difficulty for the higher level learners but may have affected gains made by the lower level learners. The treatments were identical except that the learners who completed the cloze task had to differentiate between pairs of collocations and then write them into the appropriate sentences. The increased learning burden of the cloze task may have reduced the time in which the lower level learners in the cloze group could focus on the collocations in comparison with the lower level reading group. Second, the increased focus on form and meaning in the cloze task may have contributed to increased learning for the higher level learners in comparison with the higher level reading group. It might be expected that the focus in the productive treatment on L2 form would result in higher scores on the productive tests. For the lower level learners in the productive treatment, the increased learning burden of the cloze task may have, in turn, decreased the amount of time they could focus on L2 form in comparison with those in the receptive treatment. Third, the contrast in results between the higher and lower level learners may have resulted from how the reading groups approached their task. Although the instructions simply asked the reading group to try to understand the collocations and the sentences in which they appeared, many of the higher level learners wrote out translations of the sentences. This strategy may have increased the time taken to complete the reading task and decreased the time the higher level learners could focus on the collocations.

²One reviewer suggests that the provision of the L2 forms of the target collocations on the answer sheet may have increased the potential gains in receptive knowledge for the productive group.
In contrast, none of the lower level learners used this strategy, perhaps because they did not have the ability to do so. Because the productive task tended to take longer than the receptive task, the lower level learners in the reading group may have been able to focus longer on each collocation than the higher level learners in the group. Earlier research investigating receptive and productive learning supports this finding. Webb (2005) found that the amount of time spent on the tasks may determine whether receptive or productive tasks are more effective. The contrast in findings between the two groups suggests that more research investigating the effects of receptive and productive learning is warranted. Examining the different approaches that learners of varying levels take toward completing a task may be a useful follow-up to this study.

A third purpose of this study was to investigate the relationship between collocation and meaning. Because the productive tests had a similar format and were unlikely to be affected by any of the previous tests, they should have provided a valid comparison between the two aspects of knowledge. The receptive tests, however, would not offer an accurate comparison because of the difference in format on the two tests. Mean scores on the productive tests were slightly higher for both groups on the test of meaning than on the test of collocation. Using the sensitive scoring system, the mean scores on the productive tests of meaning and collocation were 12.59 (52%) and 8.68 (36%), respectively, for all of the learners combined, 12.87 (54%) and 8.21 (34%) for all of the higher level learners, and 12.27 (51%) and 9.22 (38%) for the lower level learners. The learners might have scored higher on the test of meaning because for several of the collocations, such as *blow nose*, *give example*, *tell time*, and *remember time*, the words in the collocations were likely to be known, and there is a high degree of overlap in L1 meaning and L2 form for those collocations. Conversely, the cues for the node words on the productive collocation test were not nearly as beneficial because each node word could be paired with a large number of collocates. If the productive test of meaning was slightly easier than the productive test of collocation, the results may indicate that knowledge of collocation can be acquired at a rate similar to that of meaning. Moreover, the findings suggest that tasks which focus on collocation as well as meaning may be effective. The amount of learning may be dependent, however, on the tasks. Incidental tasks are likely to contribute to much smaller gains in both aspects of knowledge, with the size of the gains related to the clarity of the meaning in the context, the degree of overlap in L1 meaning and L2 form, and the number and frequency of encounters. Further research investigating the effects of learning collocation in different types of tasks may help to clarify the relationship between meaning and collocation. One question that still needs to be investigated is whether tasks which focus on multiple aspects of knowledge reduce the size of gains. For example, would a reading activity that focuses on
meaning lead to greater gains in knowledge of meaning than a reading activity that focuses on meaning and collocation?

**Teaching Implications**

The current study has shown that commonly used tasks for teaching individual words, such as glossed sentences and cloze tasks, can easily be altered to effectively teach collocation as well as meaning. In the ESL context, it may be enough to make learners aware of the importance of learning collocation, and to teach them to notice words that regularly appear together in context. This method may, in turn, lead to incidental gains. However, in an EFL context, in which incidental gains tend to be relatively small, it may be useful for teachers to not only make their learners aware of collocation, but also to teach it. The results of this study indicate that collocation can be effectively taught in a relatively short period of time. For teachers, perhaps the most important task may be to determine which collocations need to be taught, which is likely to vary from program to program.

The current study investigated learning unknown collocations of known words. Teachers may find that this is an effective way of making learners more aware that vocabulary learning is more than simply learning knowledge of meaning. Nation’s (2001) framework of vocabulary knowledge shows how much is involved in knowing a word. Teaching collocations for known words may be a useful method of strengthening knowledge of meaning for previously taught vocabulary, as well as increasing the depth of knowledge for those words.

The results also indicate that teaching 24 collocations for 24 different known words may be a manageable number of collocations for students to learn in a short period of time. The learners in this study were able to gain receptive knowledge of almost all of the collocations but could only demonstrate productive knowledge of collocation for about 40% of the target words. Teachers may wish to increase the demands of the productive task in order to help develop greater productive knowledge. More demanding cloze tasks or sentence production tasks may contribute to greater productive learning. However, learners are also more likely to spend more time on more demanding tasks.

**Limitations**

It should be noted that varying the time spent on the tasks may have influenced the findings. Webb (2005) found that when learners were given only as much time as they needed to complete receptive and productive tasks, the productive task (which took longer) was more effective.
However, when the time spent on the tasks was the same, the receptive treatment was more effective.

A second limitation is that pretests measuring productive knowledge were not administered. It is very difficult to ascertain on productive pretests whether the participants do, in fact, have knowledge of the target responses if they have answered incorrectly because most productive tests allow for the possibility of answering correctly with responses which are semantically related to the target words. For example, for the collocation *remember time*, on both of the productive tests the response *remember day* would be incorrect, despite the fact that *day* is a collocate of *remember* and *remember day* is very close in meaning to *remember time*. In posttests, this problem can be solved by instructing the participants to provide responses that were learned in the treatment. It may also be useful for future studies to use deeper measures such as sentence production tests to determine the extent of productive gains.

A third limitation is that delayed tests were not given in this study. Because the participants were in an EFL situation and were unlikely to encounter the collocations often, the rate of decay was likely to follow that of previous studies (see, e.g., Waring & Takaki, 2003). Measuring the changes in gains over time is likely to be more useful in an ESL setting where learners are likely to have a greater amount of input and the rate of decay may fluctuate.

**CONCLUSION**

The current study examined the effects of receptive and productive tasks on learning collocation and meaning. Participants in the receptive group encountered target collocations in three glossed sentences, and participants in the productive group completed a cloze task in which they had to fill in the target collocations in blanks using the same sentences read by the receptive group. The results showed that learners in both groups were able to gain receptive knowledge of collocation and meaning for approximately 18 of the 24 target collocations and productive knowledge of collocation for approximately 8 of the collocations and productive knowledge of meaning for approximately 12 of the collocations. If the productive tests were scored for correct spelling, the percentage of correct responses decreased by about 10% for both aspects of knowledge. Overall, there was no statistical difference between the two tasks on any of the tests. However, when the learners were grouped according to level, more advanced learners who completed the cloze task outperformed those who completed the reading task on all of the tests except on the receptive knowledge of meaning test. Conversely, lower level learners who completed the reading task had significantly higher scores on all of the posttests except on the measure of receptive knowledge of collocation.
The results indicate that both receptive and productive tasks may be effective for gaining knowledge of collocation and meaning. The findings also showed that knowledge of meaning and collocation may be learned at a similar rate in intentional tasks, which suggests that teachers and learners who want to increase depth of knowledge should focus on more than one aspect of vocabulary knowledge. Because there are very few studies examining learning collocation, further research investigating the effects of other vocabulary learning tasks would be a useful follow-up to this study.

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REFERENCES


A corpus study of lexical and pragmatic constraints on lexical co-occurrence. 
*International Journal of Corpus Linguistics, 10,* 266–270.


APPENDIX

sit exams = 試験を受ける
I have to sit the university entrance exams next year.
In four weeks he would sit the next exams, those in law.
Some children may sit entrance exams to private schools at 11.

raise questions = 問題を提起する
The results will also raise questions about newer drugs.
These developments raise two important questions.
Books like these will raise questions in the student’s mind.

pull strings = 裏から手を回す
Tony is sure he can pull a few strings and get you in.
Do you want me to pull a few strings for you?
I might be able to pull a few strings; you come back here and see me.

ensure safety = 安全を確保する
We will do all we can to ensure the safety of the players.
Every effort was being made to ensure the safety of the public.
China says it needs more tests to ensure the safety of its nuclear devices.

lose touch = 音信不通になる
A lot of famous people lose touch with their old friends.
Mick does not want to lose touch with his children.
We mustn’t lose touch with our family.

meet demand = 需要を満たす
This is the only way the club can meet the demand for tickets from supporters.
Railways were built to meet a clear demand to move people.
This will allow us to meet the public’s demand for manufactured goods.

grant wish = 願いをかなえる
It may be too late to grant Larry’s wish in time.
I'd happily grant him his wish.
I’m looking for someone who’ll grant my wish.

launch attacks = 攻擊を開始する
Turkey might be used as a base from which to launch attacks on Iraq.
We must make sure we win the ball and then launch our own attacks.
From the islands, we will launch the land attacks.

cut corners = 手を抜く
The companies will cut corners in order to make money.
We try to find a way to cut corners on whatever examinations we have.
People at the top don’t cut corners.

shoot film = 映画を撮影する
I would go 300 kilometers to shoot the film then I would leave there.
I hoped that he would agree to shoot the film.
I never went on location to shoot a film.

draw blood = 採血する
I’m going to draw a blood sample from Mr. Smith.
The doctor also had to draw some blood from the affected area.
He won’t let you draw his blood without asking first.

develop strategies = 戦略を練る
These sections help students to develop effective examination strategies.
We want to give each company the opportunity to develop strategies for new product development.
The industry should develop strategies to deal with major problems.

touch wood = 幸運が続きますように。(あまりに幸せなので悪いことが起こりません。)
I’m 54 and I’m in good health, touch wood.
Touch wood, everything is fine with him right now.
My health has always been good, touch wood, but as a child I was sometimes sick.

throw light = 明らかにする
There are good books that throw light on these questions.
The person who could throw light on the mystery is here tonight.
Today’s news might throw light on the subject.

buy time = 時間を稼ぐ
He is probably trying to buy time to improve his relationship with the others.
The man tried to buy himself more time by making a boat.
Going to America would buy him the time he needed to fix the problems.

see light = やっと分かる
She could see the light and knew that her dreams would not come true.
There is a small chance he will see the light and marry you.
Mother made him see the light.

spread word = うわさを広める
All she did was help to spread the word about us to millions of people.
Please help us spread the word by giving copies of these papers to your friends.
The government acted quickly and spread the word about what he had done.

stay course = 最後まであきらめない
We will stay the course and we will succeed.
If you stay the course and complete high school, your parents will be very happy.
How can you tell people to stay the course when you don’t look like you are trying.

give example = 例を挙げる
Name and give an example of four types of popular dance steps.
To give an example of the kind of things that he said would not be right.
Please give an example of a French red wine.

read thoughts = 人の考えを読み取る
Though I could not read her thoughts, it seemed to me that she was happy that I was here.
Larry must have read her thoughts, because he looked worried.
I could read her thoughts as I knew she could mine, so I said nothing and took her hand.

blow nose = 鼻をかむ
Go and get a handkerchief and blow your nose.
She stopped to dry her eyes and blow her nose.
I am not able to blow my nose because I cannot use my hands.

remember time = 過去があったのを覚えている
I can’t remember a time when children in America could play safely in the streets.
I remember one time when she didn’t say anything to me for more than a week.
He could remember the time when he went to the store without any money.

run risk = 危険を冒す
I’ll do it and run the risk that they will throw me in prison.
The family had run the risk of losing their home.
It does seem to me that we really do run the risk of getting in trouble.

tell time = 時間を言う
Susan was surprised that the boy could tell the time from the old watch.
My four-year old daughter cannot tell the time with this clock.
This clock can teach your child to tell the time in just fifteen minutes.