Learning word pairs and glossed sentences: the effects of a single context on vocabulary knowledge

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Previous research investigating the effects of contextualized and decontextualized tasks on vocabulary learning has focused on whether or not learners were able to gain knowledge of meaning and form. To date, research has generated little evidence indicating that context facilitates vocabulary learning. Decontextualized tasks tend to be equally or more effective than contextualized tasks at promoting knowledge of meaning and form. However, aspects of knowledge that would seem more likely to be gained through learning from context have rarely been measured. The present study examined the effects of context on grammatical functions, syntagmatic association, paradigmatic association, orthography, and meaning and form. Japanese EFL students learned target words in word pairs and a single glossed sentence. To measure the effects of each task on vocabulary learning each target word was tested in 10 different ways. The results showed that there was no significant difference between the scores of subjects who met target words in a single glossed sentence and those who learned word pairs. This suggests that a single glossed sentence context may have little effect on vocabulary knowledge. The effects each task had on the different aspects of vocabulary knowledge are discussed in detail.

I Introduction

Past research has demonstrated that learners can gain knowledge of meaning and form through incidental reading tasks (see, for example, Day et al., 1991; Dupuy and Krashen, 1993; Hulstijn, 1992; Jenkins et al., 1984; Nagy et al., 1985), and intentional reading tasks (Gipe and Arnold, 1979). Unfortunately, very few studies have investigated whether any other aspects of knowledge are gained from meeting words in context. This is due to neglect and is quite surprising considering the strong support from many vocabulary researchers for learning in context (see, for example, Crow, 1986; Krashen, 1989; Oxford and Crookall, 1990).

Certainly, learners can gain knowledge of meaning from context. In fact they may learn much more about the meaning of a word from context than
they can from a translation or synonym. Often it is context that makes the meaning of a polysemous word apparent. Miller (1999) reports that each meaning sense of a word may be associated with different contexts. One of his examples is the noun shot. In the sentence ‘That was a good shot’, the meaning of shot is dependent on the discourse in which it is used. In a bar, shot refers to a drink, to a photographer it refers to an image, and to an athlete it is something entirely different. It is highly unlikely that in a decontextualized learning task, learners could gain such knowledge from a synonym or L1 translation.

The different semantic relationships and associations words have might also be learned through context. In a decontextualized task, those associations may be dependent on the associations that have developed with that word in the L1. Knowledge of the grammatical functions of a word such as its part of speech, derivatives and the places it usually appears in a sentence, as well as knowledge of syntax such as syntagmatic associations and collocations may also be gained through context. Intuitively, syntactic and grammatical knowledge do not seem as likely to be gained through decontextualized learning, and one criticism of tasks such as learning word pairs is that they do not provide learners with information on how to use target vocabulary (Oxford and Crookall, 1990). Learners may also learn how to use a word through meeting it in different contexts. Unless there is a large degree of overlap in L1 meaning, it seems unlikely that learners would be able to use new words after encountering them in a decontextualized task.

In summary, it seems likely that many aspects of vocabulary knowledge may be gained through learning in context. Moreover, context may provide a better chance of gaining vocabulary knowledge than decontextualized learning from translations, definitions or synonyms.

1 Comparing learning from context with learning word pairs

Decontextualized vocabulary learning tasks such as learning word pairs have consistently been found to contribute to large gains in knowledge of meaning and form (Thorndike, 1908; Webb, 1962). In contrast, contextualized tasks such as incidental vocabulary learning from reading have been found to contribute to relatively small gains in knowledge of meaning and form (Day et al., 1991; Dupuy and Krashen, 1993; Hulstijn, 1992; Pitts et al., 1989). Studies comparing learning in context and decontextualized vocabulary learning have investigated the effects of different tasks on only one aspect of vocabulary knowledge – meaning and form (Dempster, 1987; Griffin, 1992; Laufer and Shmueli, 1997; Pickering, 1982; Prince, 1996; Seibert, 1930). Comparisons between incidental vocabulary learning and learning word pairs have shown that much larger gains in knowledge of meaning and form are made by learners who took part in the decontextualized tasks (Laufer and Shmueli, 1997; Prince, 1996; Seibert, 1930). In most of those studies, incidental learning from context and explicit learning in a decontextualized task
were compared, making it impossible to accurately assess the effects of context. However, there are four studies that have examined explicit learning from context and explicit learning of word pairs (Dempster, 1987; Griffin, 1992; Laufer and Shmueli, 1997; Seibert, 1930). The results of those studies showed that both tasks may be effective methods of learning vocabulary. Learners from both conditions produced large gains in knowledge of meaning and form in a relatively short time. The studies do not, however, show one task to be superior, nor do they demonstrate that context has any effect on vocabulary learning. Seibert (1930) found that the decontextualized task was more effective. Griffin (1992) suggests that contextualized tasks may be superior for advanced learners and inferior for beginners, and Dempster (1987) and Laufer and Shmueli (1997) found that context may have little or no effect on vocabulary gains.

One weakness of all of the studies mentioned above is that only knowledge of meaning and form was measured. It is somewhat surprising since many applied linguists have discussed what is involved in knowing a word, and agree that knowing a word involves much more than simply knowledge of meaning and form (Aitchison, 1994; Laufer, 1997; McCarthy, 1990; Miller, 1999; Nation, 1990; 2001; Richards, 1976; Schmitt, 1993; 1994; 1998; 2000). In perhaps the most comprehensive description of vocabulary knowledge, Nation (2001: 27) identifies nine different types of vocabulary knowledge that are a part of knowing a word.

Meaning and form is certainly the most important aspect of vocabulary knowledge. However, when comparing decontextualized and contextualized tasks it may be important to measure multiple aspects of knowledge. For example, it could be expected that tasks which provide the meaning of target words will produce large gains in knowledge of meaning. Moreover, it should not be unexpected that decontextualized tasks such as learning word pairs contribute to large gains in meaning and form since they focus learners solely on linking meaning with form. In contrast, contextualized tasks may focus learners on different aspects of vocabulary knowledge such as grammatical functions, paradigmatic association and syntagmatic association that would appear to be ignored in decontextualized tasks. If research investigating decontextualized and contextualized tasks measures only knowledge of meaning and form, the results could be misleading. To determine the effects of context on vocabulary knowledge it may be necessary to measure multiple aspects to find how context affects vocabulary acquisition.

The present study was set up to gain further insight into the effects of contextualized and decontextualized learning tasks on vocabulary knowledge. Specifically this study was designed to investigate: (a) the effects of a single glossed sentence context on five aspects of vocabulary knowledge: orthography, paradigmatic association, syntagmatic association, grammatical functions, and meaning and form; and (b) to determine the relative efficacy of learning glossed sentences and word pairs.
II Methodology

1 Participants

The population sample consisted of 84 students learning English as a foreign language (EFL) in Fukuoka, Japan. The participants were selected from two first-year EFL classes at Kyushu University. All of the learners had studied English for a minimum of six years, and had scored 80% or higher on the 2000 word level of Version 1 of the Vocabulary Levels Test (Schmitt, 2000). Their mean score was 27.1/30, indicating that they were well in control of that level, and that they had receptive knowledge of almost all of the 2000 most frequent words (Schmitt et al., 2001). The Vocabulary Levels Test and pilot studies made it reasonably certain that the subjects would know all of the words presented in the glossed sentence contexts. The subjects were randomly assigned to the experimental and comparison groups.

2 Design

The experiment was conducted within one 90-minute class period. Two groups – experimental and comparison – were used in this study to examine the effects of single glossed sentence contexts on vocabulary learning. The experimental group participated in a task involving learning glossed sentences, and the comparison group completed a learning word pairs task. The word pairs task involved learning a list of 20 disguised forms matched with the L1 meanings of 20-low frequency L2 words. The subjects in the experimental group received the same list of word pairs; however, each target word was also shown in a sentence beside the word pairs. All of the target words were underlined in the sentences. Both groups were given eight minutes to learn the target words. After the conclusion of the treatments, a surprise vocabulary test was administered. Five types of word knowledge – orthography, paradigmatic association, meaning and form, syntagmatic association, and grammatical functions – were isolated and measured in a series of 10 tests. The tests assessed each knowledge type at two levels of difficulty. Productive tests were designed to measure fuller knowledge, and receptive tests were designed to measure partial knowledge.

The participants were not given any instruction on learning strategies such as the keyword technique prior to the treatment, nor were they told how they would be tested. Each test was on one page. The first test measuring productive knowledge of orthography was administered to all of the subjects at one time because it involved aural cues spaced 12 seconds apart. The learners were given as much time as they needed to complete the rest of the tests. When a participant finished a test, it was collected and the next test was handed out.

3 Target words

Twenty low-frequency words were selected as target words. The number of target words was determined during pilot studies. Ten were low-frequency
words with high-frequency synonyms (Set A), and the other 10 were low-frequency words without high-frequency synonyms (Set B). L2 target words with high-frequency synonyms allow subjects the possibility of gaining L2 knowledge from both their L1 translations and their L2 synonyms. In contrast, using target words without high-frequency synonyms ensured that subjects could only gain knowledge of those words from their L1 translations or the contexts in which they were presented. Both sets of target words were composed of six nouns and four verbs. The ratio of six nouns to four verbs was used because nouns and verbs are the most common parts of speech found in natural text, and the 6:4 ratio approximates their proportional frequency of occurrence (Kucera and Francis, 1967). All of the target words were taken from the fifth frequency band in the COBUILD dictionary. It accounts for the 6601st to 14,700th most frequent words. The target words with high-frequency synonyms were as follows: locomotive, visage, lane, abode, boulder, crave, doze, sob, abhor and dagger. The target words without high-frequency synonyms were as follows: lick, spear, recluse, pawn, landfill, mourn, convent, pier, reef and marinate.

Disguised forms replaced the L2 forms of the 20 target words. Using disguised forms ensured that the subjects would have no prior knowledge of the target words. All of the disguised forms were two syllables, and resembled English words phonetically and orthographically. Since it was possible that the subjects could mistake the disguised forms for real words that were orthographically similar, the spellings of the disguised forms did not always conform to common spellings. However, in pilot tests, Japanese learners were able to pronounce all of the words correctly, and reported that they believed the disguised forms to be authentic English words. Since the subjects in the experiments were not aware that disguised forms were used, learning the disguised forms simulated for the learners the experience of learning actual words. In each frequency group, seven of the disguised forms were five letters long, and three were six letters long. The 20 disguised forms were as follows: ancon, cader, dangy, denent, faddam, hodet, masco, pacon, sagod, tasper, copac, gishom, hattaw, ictay, mesut, nasin, nuggy, tagon, toncop and dapew.

There were several advantages to using disguised forms rather than low-frequency words. First, it ensured that subjects had no prior knowledge of the target words. Finding target words that no subjects have met previously is very difficult. Often there are target words that some students know. To avoid this, very infrequent target words are used. Unfortunately, infrequent words do not often occur in text with very frequent words. Therefore, it is very difficult for researchers to use authentic text. Another advantage of using disguised forms is that there is no need to use a pre-test to measure for prior knowledge of the target words. Studies that use low-frequency words use pre-tests to control for prior knowledge. If it is found that some subjects have prior knowledge of a target word, then the item can be omitted from the study or it can be taken into account when formulating the results. There are several weaknesses with this
approach. Some pre-tests may not be sensitive enough to measure partial knowledge. Learners may have met a word in context but only have a vague sense of its meaning. They may have full or partial grammatical or orthographic knowledge though. There may also be a small learning effect from doing a pre-test. Certainly, subjects would gain knowledge of form from seeing target words in a pre-test. Another problem with the use of pre-tests is that subjects may be tipped off that the focus of the study is vocabulary acquisition.

4 Word pairs

In the word pairs treatment, the 20 disguised forms were presented together with their L1 translations on one page. The disguised forms were on the left of the translations. In the following example, the target word *locomotive* was replaced with the disguised form *masco*, and paired with the Japanese translation of *locomotive*:

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masco 機関車
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The order of the word pairs, pairs with high-frequency synonyms and pairs without high-frequency synonyms, was controlled to ensure that it did not affect learning. Target words with high-frequency synonyms alternated with target words without high-frequency synonyms. For half of the subjects, the high-frequency disguised forms were presented first, and for the others, the low-frequency disguised forms were first.

5 Sentence contexts

In the learning from glossed sentences treatment (see Appendix A), the experimental group was presented with the 20 target words followed by their L1 meanings. One sentence containing a target word followed each word pair. The following example is from the learning from the glossed sentences treatment:

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masco 機関車 The driver got off the masco.
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The sentences were selected from the British National Corpus. Three factors were considered when selecting the contexts: the number of words, the frequency of the words, and the ease in comprehending the sentence. Longer sentences were not chosen because they increased the time necessary to complete the treatment. Controlling the running words in the contexts ensured that the learners would quickly understand the sentences. Extensive pilot testing was used to ascertain that subjects were likely to be familiar with all of the running words in the contexts. Since the purpose of the contexts was to determine how they influenced vocabulary knowledge, it was necessary that they were easily understood. If subjects could not understand some of the sentences, it would not be clear how context affected learning.
The order of the contexts was controlled in the treatment. Half of the subjects in the comparison groups met contexts containing target words with high-frequency synonyms first, and half of the subjects met contexts without high-frequency synonyms first.

It should be noted that contextualized learning in this study was limited to single glossed sentences. The definition of context often varies greatly between studies, and richer sources of context involving repeated encounters with target words may have a different effect on vocabulary knowledge.

6 Dependent measures

Ten tests that measured knowledge of orthography, paradigmatic association, syntagmatic association, grammatical functions, and meaning and form were administered after the treatments. Each test enabled learners to demonstrate a specific aspect of word knowledge productively or receptively. The tests were carefully sequenced to avoid earlier tests affecting answers to later tests. Since the aim of this study was to find how the learning tasks affected each aspect of knowledge, it was very important to isolate each type of knowledge. If a test involved more than one aspect, the gain would be unclear. It would also be uncertain how each type of knowledge influenced the scores on that test. Webb (2005) described the tests as follows:

a Productive knowledge of orthography: On the first test, which measured productive knowledge of orthography, the learners heard each target disguised form pronounced twice and then had 10 seconds to write it correctly. If there were any spelling mistakes the answers were marked incorrect. Because the learners were at the intermediate level and were likely to have learned most – if not all – of the rules of spelling, aural cues would be enough to lead them to write at least a close approximation of the target words. If responses with minor spelling mistakes were marked as correct, then it could not be determined whether it was due to the learning task or the aural prompt. On all of the other productive tests, spelling was not a determining factor in scoring if the response could be clearly understood.

b Receptive knowledge of orthography: The second test measured receptive knowledge of orthography; the learners had to circle the correctly spelled target words, which appeared with three distracters. The distracters were created to resemble the target words both phonetically and orthographically. The following examples are for the target words dangy and hodet.

(a) dengie  (b) dengy  (c) dngie  (d) dangy
(a) hodet  (b) holat  (c) halet  (d) hedet

Usually, all productive tests need to be completed before receptive tests in order to avoid a learning effect. However, it was highly unlikely that the
receptive test of orthography would contribute to a learning effect in this study for two reasons: (a) the target words were used as cues on three of the four remaining productive tests; and (b) the determining factor on the other test measuring productive knowledge of meaning and form was whether the learners could link the L2 form with its L1 meaning rather than spelling the L2 form correctly.

c Productive knowledge of meaning and form: Productive knowledge of meaning and form was measured by means of a translation test; the learners were given the L1 meanings and asked to write the words that the meanings had been paired with in the treatment. The aim of this test was to determine whether the learners could link the L2 form of the target words with their L1 meanings. To score correctly, the learners had to write the target disguised form masco beside the L1 translation with which it was paired.

Because the aim of the first two tests was to determine whether or not learners could write the target words correctly and recognize the correct spellings of the target words, spelling was not the determining factor for a correct answer in this test. Therefore, spellings that demonstrated that the learners could link the L2 form with its L1 meaning were marked correct. In the example above, close approximations of the target word masco (e.g. mosco, masko, or mascoe) were acceptable responses.

d Productive knowledge of grammatical functions: The productive knowledge of grammatical functions test was essentially a sentence construction test. Learners were cued with the target words and had to write each one in a sentence. It was made clear in the instructions that the only determining factor for a correct response was using the target words with grammatical accuracy. For example, the target word masco ‘locomotive’ would have been scored as incorrect for The girl mascoed to school and correct in both The masco left the station early and It is a masco.

e Productive knowledge of syntagmatic association: In word association research, responses are often classified as either paradigmatic (demonstrating productive knowledge of paradigmatic association) or syntagmatic (demonstrating productive knowledge of syntagmatic association; Soderman, 1993). On this test, the learners had to produce a L2 syntagmatic associate beside the cues, which were the target words. For example, for the target word masco, which had been paired with the Japanese translation of locomotive, acceptable responses were words commonly met in context with locomotive, such as station, tracks, left and arrived. Words less frequently found in context with locomotive – such as clock, ate and hard – were marked as incorrect. Because the following test measured productive knowledge of
paradigmatic association, paradigmatic associates were marked as incorrect. This was carefully explained in the instructions.

A commonsense approach was used when evaluating responses because L2 learners often respond with more variety and less uniformity than native speakers on word association tests (Meara, 1983). A comparison of the native speaker and learner responses was considered, but this might be better suited to determining whether learners gain full knowledge of syntagmatic association. In the current study, measuring for partial knowledge provides a more useful assessment of the relative efficacy of the tasks. Therefore, in both the productive tests of paradigmatic and syntagmatic association, a commonsense approach to marking was employed. A second English native speaker was also employed to evaluate the responses. Inter-rater reliability was found to be 94%.

f Productive knowledge of paradigmatic association: This test was designed to measure knowledge of paradigmatic association; learners were presented with the target words and asked to write an associate beside each item. Coordinates, superordinates, subordinates, antonyms and synonyms were all scored as correct. Because the previous test measured productive knowledge of syntagmatic association, syntagmatic associates were marked as incorrect, as was carefully explained in the instructions. Examples of some acceptable responses for masco ‘locomotive’ were train, airplane and vehicle. The method of scoring the responses was the same as in the previous test. Inter-rater reliability on this test was found to be 98%.

g Receptive knowledge of grammatical functions: This test measured receptive knowledge of grammatical functions by means of a multiple-choice test. Learners were presented with three sentences containing each target word and had to choose the correct one from three choices. Knowledge of the target word’s part of speech enabled the learners to select the correct answer. Because the productive test of grammatical functions was perhaps the most demanding test, it was important that the receptive test of grammatical functions was sensitive to smaller gains. If the learners knew that masco ‘locomotive’ was a noun, they would be able to choose (a) as the correct answer.

(a) It is a masco.
(b) It mascoed.
(c) It is very masco.

h Receptive knowledge of syntagmatic association: On this test, the learners circled the responses that were most likely to appear in context with the target words. All distracters were words that the learners were likely to know and were the same part of speech as the correct answer. The following examples are for the target words dangy ‘boulder’ and hodet ‘lane’.

dangy (a) fall (b) wash (c) walk (d) catch
hodet (a) drive (b) sit (c) take (d) know
i **Receptive knowledge of paradigmatic association:** On this test, the learners had to circle the responses that were paradigmatic associates of the target words. All distracters were words that the learners were likely to know and were the same part of speech as the correct answer. This is illustrated for the target words *dangy* ‘boulder’ and *hodet* ‘lane’ in the following examples.

<table>
<thead>
<tr>
<th>dangy</th>
<th>(a) stone</th>
<th>(b) plant</th>
<th>(c) tree</th>
<th>(d) person</th>
</tr>
</thead>
<tbody>
<tr>
<td>hodet</td>
<td>(a) park</td>
<td>(b) highway</td>
<td>(c) garden</td>
<td>(d) building</td>
</tr>
</tbody>
</table>

j **Receptive knowledge of meaning and form:** This was a receptive translation test in which the target words cued responses of L1 form. An argument can be made that a receptive translation test involves both receptive and productive processes (Waring, 1999); however, the same argument can be made for most receptive tests. Because the learners had learned the answers in the treatments, a recognition test would have been extremely easy. The receptive translation test was better suited for this experiment because it was more demanding, requiring learners to recall rather than recognize meanings. In the following example, the learners were required to write the Japanese translation of *locomotive* beside the target disguised form *masco*.

```
masco ————
```

7 **Pilot studies**

Pilot studies conducted with Japanese learners studying English as a foreign language determined the following:

1) The subjects were unlikely to have prior L2 knowledge of the 20 target words. However, they were likely to know the high-frequency L2 synonyms of the 10 target words from Set A.
2) The 20 disguised forms created for this experiment were unlikely to cause any interlanguage problems for the subjects.
3) The subjects should be able to understand the contexts and know all of the running words used in the glossed sentences.
4) Eight minutes was enough time for the subjects to complete the treatments.
5) Japanese learners were able to correctly answer all of the receptive tests when they knew the L1 meanings for each target word.

8 **Case studies**

Case studies were done with two learners. One completed the word pairs task and the other completed the glossed sentences task. They were asked to think aloud as they completed the treatments and the dependent measures to provide insight into their thought processes. Their results were not included
in the experiment, nor did they participate in the experiment. The following observations emerged from the two case studies:

1) The subjects used different learning strategies in the two treatments. In the word pairs treatment, the subject used both a receptive word pairs task – covering the L1 meanings and then trying to recall them – and mnemonics to try to learn the target words. In the learning from glossed sentences treatment, the subject attempted to memorize both the target words and the sentences.

2) Both subjects indicated that their inability to recall which meanings were linked to each target word caused the most difficulty on the tests of meaning, paradigmatic association, syntagmatic association and grammar.

3) The focus on spelling in the first two tests may have weakened the link between form and meaning. Both subjects reported that they forgot which words were linked to some of the meanings when they were concentrating on the tests of orthography.

III Results

The descriptive statistics (means, standard deviations and number of subjects) of vocabulary knowledge scores for the 10 dependent measures are shown in Table 1. To determine whether there were any overall differences among the treatment groups, a multivariate analysis of variance (MANOVA) was performed using the scores on the 10 dependent measures (productive orthography, receptive orthography, productive meaning and form, receptive meaning and form, productive paradigmatic association, receptive paradigmatic association, productive syntagmatic association, receptive syntagmatic association, productive grammar and receptive grammar). The independent

<table>
<thead>
<tr>
<th>Learning condition</th>
<th>n</th>
<th>PO</th>
<th>RO</th>
<th>PM</th>
<th>RM</th>
<th>PA</th>
<th>RA</th>
<th>PS</th>
<th>RS</th>
<th>PG</th>
<th>RG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word pairs</td>
<td>43</td>
<td>10.98</td>
<td>14.70</td>
<td>11.21</td>
<td>8.35</td>
<td>12.00</td>
<td>8.12</td>
<td>11.70</td>
<td>9.79</td>
<td>13.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.22)</td>
<td>(3.64)</td>
<td>(5.33)</td>
<td>(5.56)</td>
<td>(4.50)</td>
<td>(4.78)</td>
<td>(4.95)</td>
<td>(5.38)</td>
<td>(4.77)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.53)</td>
<td>(3.45)</td>
<td>(5.13)</td>
<td>(5.73)</td>
<td>(5.07)</td>
<td>(4.10)</td>
<td>(4.65)</td>
<td>(3.81)</td>
<td>(5.39)</td>
<td>(3.43)</td>
</tr>
</tbody>
</table>

Note: Maximum score = 20; standard deviations are in parentheses. Key: PO = productive knowledge of orthography; RO = receptive knowledge of orthography; PM = productive knowledge of meaning and form; RM = receptive knowledge of meaning and form; PA = productive knowledge of paradigmatic association; RA = receptive knowledge of paradigmatic association; PS = productive knowledge of syntagmatic association; RS = receptive knowledge of syntagmatic association; PG = productive knowledge of grammar; RG = receptive knowledge of grammar.
variable was the type of learning task (learning word pairs and learning glossed sentences). The MANOVA did not realize an overall statistically significant difference (Pillai’s Trace, Hotelling’s Trace, Wilks’ Lambda and Roy’s Greatest Root) below $p < .05$ on any of the dependent measures ($F(10,73) = 0.83, p = .599$) indicating that a single context may have little effect on vocabulary knowledge.

Table 1 shows that both tasks contributed to gains in receptive and productive knowledge of each aspect. Surprisingly, there was very little difference between the size of the gains for the two tasks on each test. The larger gains on the receptive tests indicate that the receptive tests were more sensitive to gains in partial knowledge, as was expected. The smallest mean percentage gains for both the word pairs (41%) and glossed sentence (38%) tasks on the productive tests were found on the measure of syntagmatic association, while the largest gains were found on the test of meaning (56%, 52%, respectively). The smallest gains on the receptive tests were found on the measure of meaning (56%, 59%) and the largest were found on the test of orthography (74%, 74%). It is likely that the translation format on the receptive test of meaning resulted in slightly lower scores than on the other receptive recognition tests. Recognition measures tend to be less demanding than recall measures because the format on multiple-choice tests allows subjects to score correctly through guessing (Nation, 2001).

Since none of the differences between the two tasks were found to be significant, it would appear that a single context has little effect on knowledge of syntagmatic association and grammar. However, a comparison of the gains made from the tasks for target words with high-frequency synonyms, and those without high-frequency synonyms suggests that context may have a small effect on receptive knowledge of syntagmatic association. Table 2 shows the means and standard deviations for target words with high-frequency synonyms (Set A) and without high-frequency synonyms (Set B) from the two treatments. The largest difference (1.06) between the two tasks is for the non-synonyms on the receptive test of syntagmatic association. The percentage change in receptive knowledge of syntagmatic association resulting from context was calculated to be 19% using Sackett’s (1991) formula:

\[
\% \text{ change} = d1 \times 100 \times \frac{SD(\text{word pairs})}{M(\text{word pairs})}
\]

Where:

\[
d1 = \frac{(M_{\text{glossed sentences}} - M_{\text{word pairs}})}{SD(\text{word pairs})}
\]

A MANOVA was performed to determine whether there were any differences between the two tasks for target words with and without high-frequency synonyms. Although a significant difference was found on the receptive test of syntagmatic association for words without high-frequency synonyms ($F(1,82) = 4.20, p = .044$), the MANOVA did not realize an overall statistically significant difference (Pillai’s Trace, Hotelling’s Trace, Wilks’ Lambda,
Table 2  Means and standard deviations of learning conditions on dependent measures for words with and without high-frequency synonyms

<table>
<thead>
<tr>
<th>Word pairs</th>
<th>Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO Synonyms</td>
<td>5.56 (2.24)</td>
</tr>
<tr>
<td>Non-synonyms</td>
<td>5.42 (2.27)</td>
</tr>
<tr>
<td>RO Synonyms</td>
<td>7.53 (2.02)</td>
</tr>
<tr>
<td>Non-synonyms</td>
<td>7.16 (2.16)</td>
</tr>
<tr>
<td>PM Synonyms</td>
<td>5.51 (2.85)</td>
</tr>
<tr>
<td>Non-synonyms</td>
<td>5.70 (2.73)</td>
</tr>
<tr>
<td>RM Synonyms</td>
<td>5.60 (2.93)</td>
</tr>
<tr>
<td>Non-synonyms</td>
<td>5.56 (2.81)</td>
</tr>
<tr>
<td>PA Synonyms</td>
<td>4.88 (2.58)</td>
</tr>
<tr>
<td>Non-synonyms</td>
<td>3.47 (2.21)</td>
</tr>
<tr>
<td>RA Synonyms</td>
<td>5.95 (2.50)</td>
</tr>
<tr>
<td>Non-synonyms</td>
<td>6.05 (2.54)</td>
</tr>
<tr>
<td>PS Synonyms</td>
<td>4.37 (2.64)</td>
</tr>
<tr>
<td>Non-synonyms</td>
<td>3.74 (2.51)</td>
</tr>
<tr>
<td>RS Synonyms</td>
<td>5.98 (2.61)</td>
</tr>
<tr>
<td>Non-synonyms</td>
<td>5.72 (2.58)</td>
</tr>
<tr>
<td>PG Synonyms</td>
<td>4.88 (2.76)</td>
</tr>
<tr>
<td>Non-synonyms</td>
<td>4.91 (2.78)</td>
</tr>
<tr>
<td>RG Synonyms</td>
<td>6.86 (2.60)</td>
</tr>
<tr>
<td>Non-synonyms</td>
<td>6.95 (2.49)</td>
</tr>
</tbody>
</table>

Note: Maximum score = 10; standard deviations are in parentheses. Key: PO = productive knowledge of orthography; RO = receptive knowledge of orthography; PM = productive knowledge of meaning and form; RM = receptive knowledge of meaning and form; PA = productive knowledge of paradigmatic association; RA = receptive knowledge of paradigmatic association; PS = productive knowledge of syntagmatic association; RS = receptive knowledge of syntagmatic association; PG = productive knowledge of grammar; RG = receptive knowledge of grammar.

and Roy’s Greatest Root) below $p < .05$ between the two tasks ($F(20,63) = 1.03, p = .444$). Coupled with the earlier result showing that there were no significant differences between the two tasks for any of the aspects, the findings suggest that a single context may only have a slight effect on syntagmatic association which may be outweighed by other factors.

IV Discussion

The results suggest that a single context may have little effect on gaining vocabulary knowledge supporting the findings of Dempster (1987), and Laufer and Shmueli (1997), and contrasting with those of Griffin (1992) and Seibert (1930). The study expanded upon earlier methodologies by measuring receptive and productive knowledge of orthography, meaning, paradigmatic association
syntagmatic association and grammatical functions. All of the previous studies had defined vocabulary learning by a subject’s ability to demonstrate knowledge of meaning and form. No significant differences were found between the tasks on all 10 dependent measures. While the similarity between the scores on the tests of meaning could be expected, it was somewhat surprising that the contextualized learning task did not promote significantly larger gains in syntagmatic association and grammar. This may be due in part to the subjects’ ability to make large gains in all aspects of knowledge through the word pairs task. The size of the gains in knowledge of paradigmatic association, grammar and syntagmatic association suggests that learners are able to use L1 knowledge to gain substantial L2 knowledge of an unknown word. This is particularly apparent if we consider the findings with the non-synonyms.

The experimental design – substituting disguised forms for low frequency words without high-frequency synonyms – made it highly unlikely that the learners could draw on any L2 knowledge in the word pairs task. Therefore, any gains could be attributed solely to the presence of the L1 meaning. Table 3 shows the mean percentage gains for non-synonyms made by the word pairs subjects. The large gains made in knowledge of paradigmatic association, grammar and syntagmatic association indicate that there is a close relationship between those aspects and meaning and form. Gaining knowledge of meaning and form may facilitate gains in paradigmatic association syntagmatic association, and grammar. This may be dependent upon the degree of overlap between L1 and L2 meaning and syntagmatic association, as well as the student’s level of language proficiency. For intermediate learners, simply linking L1 meaning with L2 form may be one of the fastest methods of gaining vocabulary knowledge. However, it seems less likely that beginners would be able to demonstrate much L2 knowledge of paradigmatic association, grammar and syntagmatic association because they may lack knowledge of L2 grammar as well as the vocabulary size to recognize and produce paradigmatic and syntagmatic associates. Further research investigating how meaning affects vocabulary knowledge with learners of different proficiencies would be a very useful follow-up to this study.

Table 3  Mean percentage gains with the non-synonyms on the 10 dependent measures for the learning word pairs group

<table>
<thead>
<tr>
<th>Dependent measures</th>
<th>PO</th>
<th>RO</th>
<th>PM</th>
<th>RM</th>
<th>PA</th>
<th>RA</th>
<th>PS</th>
<th>RS</th>
<th>PG</th>
<th>RG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean gains</td>
<td>54%</td>
<td>72%</td>
<td>57%</td>
<td>56%</td>
<td>35%</td>
<td>61%</td>
<td>37%</td>
<td>57%</td>
<td>49%</td>
<td>70%</td>
</tr>
</tbody>
</table>

Key: PO=productive knowledge of orthography; RO=receptive knowledge of orthography; PM=productive knowledge of meaning and form; RM=receptive knowledge of meaning and form; PA=productive knowledge of paradigmatic association; RA=receptive knowledge of paradigmatic association; PS=productive knowledge of syntagmatic association; RS=receptive knowledge of syntagmatic association; PG=productive knowledge of grammar; RG=receptive knowledge of grammar.
Interestingly, when the gains made through the two tasks for non-synonyms were compared, there was some evidence that context does facilitate learning. The results show that the glossed sentences task promoted larger gains in receptive knowledge of syntagmatic association for non-synonyms. Since it was less likely that the subjects had L2 knowledge of syntagmatic associates for non-synonyms, they may provide a more accurate assessment of the effects of context. The difference between the two tasks for words with high-frequency synonyms may be smaller because learners may gain some L2 knowledge of syntagmatic association from known synonyms. This result also suggests that researchers must be very careful when selecting target words in vocabulary acquisition studies. The type of words chosen, and their L2 relationships may determine the size of gains. While the comparison between non-synonyms indicates that context may affect learning, it should also be noted that this does not reflect authentic vocabulary learning. It is only in the early stage of language learning that students do not know the synonyms for the majority of the words that they learn, and Griffin (1992) suggests that beginners may be unable to use context effectively. Therefore, it would seem that a single context would rarely affect vocabulary knowledge. However, it could still be found that repeated encounters with unknown words – the condition typical of incidental learning – may show context to have more of an effect on vocabulary knowledge. Investigating the effects of multiple contexts under more ecologically valid conditions would also be a useful follow-up to this study.

Another purpose of this study was to investigate the relative efficacy of the learning tasks. The results suggest that both learning word pairs and learning glossed sentences are effective methods of learning vocabulary. Both tasks promoted relatively large gains in knowledge of orthography, paradigmatic association, meaning, syntagmatic association and grammar in a short time. One reason that learning word pairs may be as effective as learning from glossed sentences is that it focuses learners on establishing a link between L1 meaning and L2 form. In tasks involving context, learners may process meaning but their attention may not be directed towards creating a link between meaning and form (Pressley et al., 1987). The results of this experiment indicate that by gaining knowledge of meaning and form learners may also gain knowledge of paradigmatic association, syntagmatic association and grammar. This in turn suggests that decontextualized tasks can be just as effective as contextualized tasks.

The findings provide a powerful argument that explicit tasks which focus learners on linking form and meaning should be encouraged. Nation (1990) has argued that learning word pairs may be an efficient way for beginners to acquire the high-frequency words needed to reach the stage where they can incidentally acquire vocabulary. One criticism of decontextualized tasks has been that they do not provide enough information for learners to be able to use words (Oxford and Crookall, 1990). However, the results suggest that intermediate and advanced learners may be able to understand and use many words once they know their L1 meanings. The extent of use may be dependent on the degree of
overlap between L1 and L2 meaning. Ideally L2 learners would enlarge their vocabulary in the same manner as L1 learners through extensive reading and listening. However, in an EFL setting, learners may not always have the resources or be able to devote the time needed to acquire vocabulary incidentally (Horst et al., 1998). Since tasks such as learning word pairs or learning glossed sentences are relatively fast, there is little reason why they cannot be incorporated into a vocabulary learning programme along with incidental learning tasks.

V Limitations

It should be noted that while this study did seek to examine the effects of context on vocabulary knowledge, it was limited to one type of context – single glossed sentences. The type of context used in vocabulary acquisition research often varies from study to study, so great care needs to be taken when interpreting the results. Different types of context may have different effects on vocabulary knowledge. Contexts differ in the amount of information that they provide about target words. Some contexts are rich in detail while others provide little or even misleading information about target words. Richer contexts may show that context has a greater effect on vocabulary knowledge than was found in this study. Examining the effects of different types of context would be a useful follow-up to this study.

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VI References


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**Appendix A: Glossed sentences with English translations in brackets**

**copac** 嘆く (mourn)  They continue to **copac** for years after the death of their friend.

**ancon** 短剣 (dagger)  She picked up his **ancon** when he wasn’t looking and cut him.

**gishom** マリネにする (marinate)  He picked up his fork and looked at the small fish **gishomed** in olive oil and garlic.

**dangy** 巨石 (boulder)  The **dangy** was as large as a small house.

**nuggy** 質に入るる (pawn)  He **nuggied** his watch to buy some new clothes.

**faddam** 住居 (abode)  He had decorated his new **faddam** with the finest furniture.

**mesut** なめる (lick)  The dog jumped up and **mesuted** his face.

**hodet** 小道 (lane)  He walked them out to the big car at the end of the **hodet**.

**dapew** 礁 (reef)  The small boat went south around the **dapew**.

**denent** 容貌 (visage)  He was always careful to wash his **denent**.

**ictay** 槍 (spear)  He was killed with the long hunting **ictay**.
masco 機関車 (locomotive) The driver got off the masco.
tagon 世捨て人 (recluse) It was true that he was a tagon and never came to the village.
pacon むせび泣く (sob) She stopped screaming and began to pacon.
nasin ごみ廃棄場 (landfill) Most of this garbage goes to nasin – very large holes in the ground far from where most people live.
cader とうとうする (doze) Closing her eyes she cadered.
hattaw 修道院 (convent) She doesn’t want to stay inside a hattaw for the rest of her life.
tasper 熱望する (crave) I used to tasper expensive clothes, and jewelry as well.
toncop 埠頭 (pier) My brother and I were at the end of the toncop, fishing.
sagod ひどく嫌い (abhorr) We do sagod dust and dirt, and dirt in the bathtub.