# The effects of context on incidental vocabulary learning 

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#### Abstract

Japanese university students learning English as a foreign language (EFL) encountered 10 target words in 3 sets of 10 short contexts that were rated on the amount of information available to infer the target words' meanings. One group of learners met the target words in contexts rated more highly than the contexts read by the other group. A surprise vocabulary test that measured recall of form, recognition of form, recall of meaning, and recognition of meaning was administered after the treatments. The results showed that the group that read the contexts containing more contextual clues had significantly higher scores on both tests of meaning. The findings indicate that the quality of the context rather than the number of encounters with target words may have a greater effect on gaining knowledge of meaning. Conversely, it is the number of encounters that will have a greater effect on knowledge of form.


Keywords: incidental learning, context, vocabulary knowledge, meaning, form, orthography, repetition

Research has shown that both first language (L1) learners (Jenkins, Stein, \& Wysocki, 1984; Nagy, Anderson, \& Herman, 1987; Nagy, Herman, \& Anderson, 1985; Shu, Anderson, \& Zhang, 1995) and second language (L2) learners (Day, Omura, \& Hiramatsu, 1991; Dupuy \& Krashen, 1993; Hulstijn, 1992; Pitts, White, \& Krashen, 1989; Waring \& Takaki, 2003) may incidentally gain knowledge of meaning through reading. While researchers tend to agree that incidental learning is responsible for the vast majority of L1 vocabulary learning (Nation, 2001; Schmitt, 2000), there is some suggestion that explicit learning of vocabulary may be responsible for most L2 vocabulary learning (Laufer, 1991, 2001; Laufer \& Paribakht, 1998; Webb, 2008). However, researchers agree that incidental vocabulary learning should be encouraged and incorporated into L2 learning (see for example, Hunt \& Beglar, 2005; Nation, 2001; Schmitt, 2000; Waring \& Takaki, 2003). Because learners incidentally gain knowledge of words in small increments, building upon their previous gains through repeated encounters until a word is known, incidental vocabulary learning can be a relatively slow process when there are long gaps between encounters. Currently it is not clear how many encounters are needed to learn an unknown L2 word. Hulstijn, Hollander, and Greidanus (1996) found that there was little difference between encountering target words once or three times. Rott (1999) suggested that six encounters may be enough to learn a word. Horst, Cobb, and Meara (1998) suggested eight encounters are needed, Saragi, Nation, and Meister (1978) suggested 10 encounters, Webb (2007a) suggested that more
than 10 encounters are needed, and Waring and Takaki (2003) reported that it may take more than 20 encounters to incidentally learn the meaning of a word. Moreover, in some of the studies the number of encounters needed to learn the meaning of a word varied considerably between the target words (Horst, et al., 1998; Saragi et al., 1978).

Context may be one reason the number of repetitions needed to learn individual words varies. In some sentences the meaning of an unknown word might be transparent but in others it may be opaque. Beck, McKeown, and McCaslin (1983) suggested that many contexts may be deceptive, leading learners to infer an incorrect meaning. In studies that involve reading books, there may be too many encounters for researchers to take each context into account. However, it could be expected that target words that are met repeatedly in sentences that offer some information about the meaning of a word are going to be learned before those that appear in less informative or misleading sentences. Unless context is taken into consideration, it may be difficult to make an accurate assessment of incidental vocabulary learning. This may be particularly true in L2 learning where the number and frequency of encounters with unknown words are likely to be less than in L1 learning.

Context may have been the reason for the contrasting results in Rott (1999) and Hulstijn et al. (1996). In the Rott (1999) study, the texts were created with enough contextual clues for the learners to be able to infer the meaning of the target words. Whereas, in the study by Hulstijn et al., the text was authentic, and the researchers had determined that it was "extremely difficult to infer the exact meaning" of the target words from the context (p. 330).

Differences between the types of contexts used in research may often account for conflicting results. This may be the case in many studies on incidental learning because a large variety of contexts have been used. For example, Herman, Anderson, Nagy, and Pearson (1987) used four different types of context in a study of incidental vocabulary learning. They used a 1,230 -word passage from a text and three edited versions with varying degrees of implicit and explicit clues about the target words. Other contexts used in incidental learning of vocabulary experiments were a novel (Saragi et al., 1978), a graded reader (Horst et al., 1998), specially constructed paragraphs (Jenkins, Stein, \& Wysocki, 1984), and narrative and expository texts of about 1,000 words (Nagy, Herman, \& Anderson, 1985). Studies on learning from context have used single sentences (Dempster, 1987; Laufer \& Shmueli, 1997), multiple sentences (Dempster, 1987), L2 sentences together with their L1 translations (Griffin, 1992), L1 sentences containing the L2 target vocabulary (Pickering, 1982), three sentences one of which was a definition (Gipe \& Arnold, 1979), and L1 and L2 glossed passages (Laufer \& Shmueli, 1997). The wide range of contexts may lead to misinterpretation of results. Would students learning vocabulary from a specially constructed passage containing many clues about a target word's meaning learn as easily from an authentic text? Probably not (Beck et al., 1983; Herman et al. 1987). Without a clear definition of context, it seems likely that results will continue to vary between studies.

The present study was carefully designed to gain insight into the effects of context on incidental vocabulary learning. Perhaps due to the length of the texts and the large number of encounters with target words, previous L2 research has provided little information about the contexts in which target words were met. Short contexts each containing a single target word were used in this study. Each context was rated on the information that could be used to infer the meanings of
the target words. By rating the contexts in which target words were encountered, the effects of more and less informative contexts could be compared.

## Method

## Participants

The participants in this study were 50 Japanese native speakers learning English as a foreign language in four $2^{\text {nd }}$-year university classes in Fukuoka, Japan. All of the participants had studied English for a minimum of 7 years and had scored 80 percent or higher at the second 1,000 -word level of Version 1 of the Vocabulary Levels Test (Schmitt, 2000). Their average raw score was 27.7/30, indicating that they had mastered that level (Schmitt, Schmitt, \& Clapham, 2001) and should have little difficulty understanding all of the running words in the treatments.

## Design

The experiment was conducted within one 90 -minute class period. The participants were randomly assigned to two groups: experimental and comparison. Each group completed a reading comprehension task. The task involved reading three sets of 10 sentences, each sentence containing 1 of 10 target words. The target words were disguised forms that had replaced 10 L2 words. The use of disguised forms ensured that the participants would have no prior knowledge of those items. The amount of information presented in the sentences that could be used to learn the meanings of the target words varied between the two tasks. Each set of 10 sentences was presented on one page. The first page was the same for both groups. However, the second and third pages that were presented to the experimental group were rated as being more informative than those sentences presented to the comparison group. Each group was given 12 minutes to complete their treatment. Four minutes was provided to read each page. In pilot tests, 4 minutes was found to be enough time for the participants to read all of the sentences on a page. A surprise vocabulary test measuring knowledge of form and meaning was administered after the treatments. The results of the groups were then compared to determine whether the amount of information presented in the contexts had a significant effect on vocabulary learning.

## Target Words

Six nouns and four verbs were selected as target words 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 in language use (Kucera \& Francis, 1967). Target words were chosen based on their frequency of occurrence in a selection of graded readers. The number of target words was determined during pilot studies. Factors, which were considered when establishing the number of target words, were subject fatigue and the time needed to complete the treatment and tests.

To ensure that the participants had no prior knowledge of the target words, they were replaced with disguised forms. The disguised forms and their L1 meanings were as follows: ancon (hospital), cader (lunch), dangy (street), denent (remember), faddam (write), hodet (face), masco
(train), pacon (wear), sagod (visit), and tasper (evening). To avoid confusion with partially known or known L2 items, the spellings of the disguised forms did not always conform to common L2 spellings. While there was a small possibility that this may have affected incidental learning of form, it should not have had any influence on the learning of meaning. In interviews with learners who took part in pilot studies, they reported that they believed all of the disguised forms to be authentic L2 words despite the fact that they were likely to have had L2 knowledge of form for the original target words. This was possible because the target words represented meanings that had low-frequency L2 synonyms. For example, although the participants may have known the words hospital and write, they were unlikely to know synonyms such as sanatorium, infirmary, inscribe, and scribble. Although the learners may have known the most frequent L2 forms, they may have assumed that there were less frequent synonyms that they did not know. Because the participants in this study did not know that disguised forms had been used, the experiment should have simulated authentic vocabulary learning. ${ }^{1}$

## Contexts

Participants encountered target words in short contexts (see Appendix A). A context was either one or two sentences long and averaged 14 words. The contexts were presented in random order on each page. Contexts were taken from the following graded readers from the Oxford Bookworm series: The Elephant Man, Lord Jim, Agatha Christie, Chemical Secret, The Garden Party and Other Stories, and Decline and Fall. Only one sense of a target word's meaning appeared in the context and the part of speech of each target word never changed from context to context. Extensive pilot testing was used to ascertain that participants were familiar with all of the running words in the contexts. Contexts that contained words that were unknown to any learner in the pilot tests were not used in the study. However, proper names that may not have been known to the participants such as King's Cross and Harrogate were included in the contexts because this is typical in graded readers. In studies where it is particularly difficult to determine the effects of a variable, controlling for unknown proper nouns may provide a more accurate assessment of its effects.

## Order and Rating of Contexts

Each sentence in the treatments was rated on the amount of information it provided about a target word's meaning. Researchers need to take into account the fact that the meaning of unknown words may be relatively clear in some contexts while in others it may be opaque or misleading. By rating each context on the information that could be used to learn the target words, the effects of context could be isolated. One weakness of previous L2 research is that little or no information has been provided about individual contexts. This is likely due to the large number of occurrences of target words and much longer texts in those studies.

The contexts were rated by two native speakers. Only contexts that were given the same rating by both native speakers were included in the study. The contexts were rated according to the following scale (adapted from Webb, 2007a):

1. Extremely unlikely that the target word can be guessed correctly. The text contains no contextual clues and may be misleading.
2. It is unlikely that the exact meaning of the target word can be inferred. However, information in the context may lead to partial knowledge of the target word's meaning.
3. Information in the context may make it possible to infer the meaning of the target word. However, there are a number of choices. Participants may gain partial knowledge.
4. Participants have a good chance of inferring the meaning correctly. There are few meanings that are logical apart from the correct meaning. Participants should gain at least partial knowledge.

The following examples for the target words sagod (visit) and ancon (hospital) were rated from 1 (least informative) to 4 (most informative) on the scale above.

1. Her brother Edward was always with her when the King came to sagod.
2. He could read about things, and talk to his visitors, but he could not go out of the ancon by himself. He thought and played like a child.
3. "She's ill, that's all," I said quickly. "We're going to the ancon."
4. He was not ill, and of course the beds in the ancon are for ill people.

The order of the sentences was determined by their ratings. For both groups, the most informative context for each target word was the first presentation. However, the second and third encounters with the target words were different. The experimental group met the target words in the second most informative context in the second presentation and the third most informative context in the third presentation. For the comparison group, the most informative context was followed by the two least informative contexts in the second and third encounters with the target words. The context ratings for each sentence are shown in Table 1.

Table 1. Ratings for each context

| Target word | More informative |  |  | Less informative |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Encounter |  |  | Encounter |  |  |
|  | $1^{\text {st }}$ | $2^{\text {nd }}$ | $3^{\text {rd }}$ | $1^{\text {st }}$ | $2^{\text {nd }}$ | $3^{\text {rd }}$ |
| ancon (hopital) | 4 | 4 | 4 | 4 | 2 | 2 |
| faddam (write) | 4 | 4 | 3 | 4 | 3 | 3 |
| masco (train) | 4 | 3 | 3 | 4 | 3 | 2 |
| pacon (wear) | 4 | 3 | 3 | 4 | 3 | 3 |
| sagod (visit) | 4 | 3 | 3 | 4 | 1 | 1 |
| denent (remember) | 4 | 4 | 4 | 4 | 3 | 2 |
| dangy (street) | 3 | 2 | 2 | 3 | 2 | 1 |
| cader (lunch) | 3 | 3 | 3 | 3 | 2 | 2 |
| hodet (face) | 4 | 4 | 3 | 4 | 2 | 2 |
| tasper (evening) | 4 | 4 | 3 | 4 | 2 | 2 |

## Dependent Measures

After the treatments, the learners were administered four tests that measured recall of form, recognition of form, recall of meaning, and recognition of meaning. ${ }^{2}$ The tests were carefully sequenced to avoid earlier tests affecting answers to later tests. The participants were given as much time as they needed to complete the tests. Because disguised forms were used as target words, delayed post-tests were not administered. Without the possibility of further encounters with the target words in or outside of the classroom, the rate of decay of vocabulary knowledge should follow established norms (see for example, Waring \& Takaki, 2003, which investigated incidental learning using disguised forms as target words).

On the first test, which measured recall of form, the participants heard each target word pronounced twice and had 10 seconds to correctly write the item. Because the participants were at an intermediate level and were likely able to write a close approximation of an unknown word based on its pronunciation, any spelling mistakes were scored as incorrect.

The second test was a multiple-choice test that measured recognition of form. On this test, the correct spelling of each target word was presented along with three distracters. The distracters resembled the target words both orthographically and phonetically. Subjects were required to circle the correct spelling to score correctly. The following examples are for the target words ancon and sagod.
a) ancon
b) ankon
c) anken
d) ancan
a) sagad
b) saggud
c) saggod
d) sagod

On the third test, which measured recall of meaning, the participants were presented with the disguised forms and were required to write their L1 translations. Direct translations of the target words or their less frequent synonyms were scored as correct. For example, for the target word ancon (hospital) the following responses would have been scored as correct: hospital, clinic, and sanatorium.

The final test was a multiple-choice test that measured recognition of meaning. On this test, each target word was presented together with the L2 word that it had replaced, and three distracters. The distracters were of the same parts of speech as the target words and had meanings that were related to the contexts read in the treatments. The following examples are for the target words ancon (hospital) and sagod (visit).
ancon
a) house
b) car
c) city
d) hospital
sagod
a) buy
b) listen
c) visit
d) sit

## Results

The descriptive statistics (means, standard deviations, and number of participants) of scores for the four dependent measures are reported in Table 2. 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 four dependent measures (recall of form, recognition of form, recall of meaning, and recognition of meaning). The independent variable was the type of learning task (incidental vocabulary learning from three informative sentences and three less informative sentences). The MANOVA realized an overall statistically significant difference, $F(4,45)=4.56, p<.01, \eta^{2}=.29$.

Table 2. Means and standard deviations of learning conditions on dependent measures

| Contexts | $n$ | Recall of <br> form | Recognition <br> of form | Recall of <br> meaning | Recognition <br> of meaning |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Less informative | 24 | $5.46(2.17)$ | $7.54(1.96)$ | $0.13(0.34)$ | $4.38(1.74)$ |
| More informative | 26 | $5.96(1.89)$ | $8.00(1.30)$ | $1.31(1.81)$ | $6.77(2.45)$ |

Note. Maximum score $=10$. Standard deviations are in parentheses.
Table 2 shows that mean scores were higher on all four measures for the participants who met the target words in the more informative contexts. Learners who encountered the target words in the more informative sentences had significantly higher scores on the tests measuring recall of meaning, $F(1,49)=9.96, p<.01, \eta^{2}=.17$, and recognition of meaning, $F(1,49)=15.59, p<.001$, $\eta^{2}=.25$. Differences between the two groups on the tests measuring recall of form, $F(1,49)=$ $0.77, p=.384, \eta^{2}=.02$, and recognition of form, $F(1,49)=0.97, p=.330, \eta^{2}=.02$, were not statistically significant.

## Discussion

The present study examined the effects of context-more and less informative-on knowledge of form and meaning. The results found context to have a significant effect on gaining knowledge of meaning. The findings support the claims by Beck et al. (1983), as well as previous L1 findings (Jenkins, Matlock, \& Slocomb, 1989) suggesting that context may affect acquisition of meaning. Learners who met target words in the three most informative contexts produced significantly higher scores on both tests measuring knowledge of meaning than learners who met the target words in the most informative context, followed by the two least informative contexts. The quality of the context provides an answer to why gains in knowledge of meaning have varied from word to word (Saragi et al., 1978; Horst et al., 1998) and study to study (Horst et al.; Rott, 1999; Saragi et al., 1978; Waring \& Takaki, 2003). If unknown words repeatedly appear in informative contexts, their meanings may be learned relatively quickly. However, if unknown words appear in less informative or misleading contexts, it may take learners much longer to gain knowledge of meaning. Determining the number of encounters needed to learn the meaning of a word is likely to vary from word to word. L2 words can be learned incidentally if they are met in context enough times. However, the number of times needed to learn words is likely dependent on the contexts in which they are encountered.

The results showed that context had little effect on gaining knowledge of form. Both groups were able to spell more than half of the target words correctly and recognize the correct spellings of more than $75 \%$ of the items with no significant difference between the scores on each test. Since both groups encountered the target words an equal number of times, the findings indicate that it
may be the number of encounters rather than the quality of encounters that affects learning form. Since the difference between the contexts related only to the meaning of target words, it might be expected that knowledge of form would not be affected. However, the results contrast findings indicating that learners may ignore unknown words in uninformative contexts (Hulstijn et al., 1996). Measuring knowledge of form as well as meaning may be a means to determine whether learners make an equal effort to learn words in informative and uninformative contexts. Because the gains in knowledge of form were similar for both groups in the present study, it might be assumed that learners spend a similar amount of time trying to learn words in different types of contexts. It is important to note, however, that the incidental learning situation created in this study is not the same as incidental vocabulary learning from longer texts. Further research investigating incidental vocabulary learning in more ecologically valid contexts would be a useful follow-up to this study.

The results of the present study were part of a larger study that also investigated the effects of repetition on incidental vocabulary learning (Webb, 2007a). Both studies employed the same methodology with learners meeting the same disguised forms in rated contexts. In Webb's study, the contexts were presented from the most informative to the least informative for groups that encountered target words $1,3,7$ and 10 times. Ten tests measuring five aspects of vocabulary knowledge were used to measure incidental learning. The three-encounter group was the same group that encountered the target words in the more informative contexts in this study. Table 3 presents Webb's results together with the results of this study.

Table 3. Means and standard deviations for incidental learning of form and meaning after meeting target words 1, 3, 7, and 10 times

| Number and quality of <br> encounters | $n$ | Recall of <br> form | Recognition <br> of form | Recall of <br> meaning | Recognition <br> of meaning |
| :--- | :---: | :---: | :---: | :---: | :---: |
| 1 encounter | 23 | 4.96 | 6.70 | 0.35 | 5.78 |
| 1 |  | $(1.94)$ | $(1.72)$ | $(0.65)$ | $(2.09)$ |
| 3 encounters | 24 | 5.46 | 7.54 | 0.13 | 4.38 |
| $1,9,10$ |  | $(2.17)$ | $(1.96)$ | $(0.34)$ | $(1.74)$ |
| 3 encounters | 26 | 5.96 | 8.00 | 1.31 | 6.77 |
| $1,2,3$ |  | $(1.89)$ | $(1.30)$ | $(1.81)$ | $(2.45)$ |
| 7 encounters | 26 | 7.19 | 8.27 | 2.65 | 6.50 |
| $1,2,3,4,5,6,7$ |  | $(1.41)$ | $(1.51)$ | $(2.77)$ | $(2.10)$ |
| 10 encounters | 24 | 7.71 | 8.75 | 2.88 | 7.58 |
| $1-10$ |  | $(1.94)$ | $(1.03)$ | $(2.40)$ | $(2.12)$ |
| Control | 1.35 |  |  |  |  |
| no encounters | 22 | $(1.02)$ |  |  |  |

Notes. Encounter $1=$ the most informative context; $2=$ the second most informative context; and $10=$ the tenth most informative context. Maximum score on the tests $=10$. Standard deviations are in parentheses. Adapted from Webb (2007a).

Webb (2007a) found that learners demonstrated significant gains in vocabulary knowledge each time the number of encounters with a word increased. Table 3, however, shows that meeting target words in an informative context followed by encounters in uninformative contexts may cause backsliding to occur. Both the single-encounter and three-encounter groups met the target
words in the same contexts in the first encounter. When the presentations of the target words were followed by encounters in informative contexts, learners had slightly higher-although not significantly higher - scores on both tests of meaning. However, when the first presentation was followed by encounters with the target words in less informative contexts, scores on the test measuring recognition of meaning were significantly smaller $(p<.05)$ than those of the singleencounter group in Webb's study. The relatively tiny gains made by the group that encountered target words in the three less informative contexts in relation to the single-encounter group suggest that initial gains resulting from meeting an unknown word in one informative context may be reduced in subsequent meetings if those contexts are less informative or misleading. It is likely that meeting a partially known word in an uninformative context may lead learners to reassess their previous knowledge or forget what they had learned. However, this may depend on the amount of knowledge previously gained.

It is also interesting to note that although the final three contexts encountered by the $10-$ encounter group were rated as the least informative, the 10 -encounter group had significantly higher scores than the 7 -encounter group on 4 of 10 measures of vocabulary knowledge (Webb, 2007a). This suggests that there may be a knowledge threshold after which backsliding is less likely to occur. If there is indeed a knowledge threshold, determining the point at which backsliding ceases to occur would be a very useful finding. It could provide researchers with a quantifiable amount that indicates whether acquisition is likely to occur. Further research is necessary to determine which aspects of knowledge are gained from meeting an unknown word in different sequences of informative and uninformative contexts. The order of contexts in both studies always began with the most informative contexts. However, learners may initially meet unknown words in less informative contexts when reading. Meeting an unknown word in a less informative context is a very common occurrence that needs to be examined.

The results have important implications for language teachers and for designers of course books and materials. Writers of graded readers need to consider the contexts in which the words that may not be known are presented. While it may not be necessary to always present target words in particularly informative contexts, words that might be unknown should not be repeatedly encountered in contexts with few contextual clues linked to the meaning of the word. Moreover, since one of the primary goals of graded readers is to help increase vocabulary learning, target vocabulary should never be presented in misleading contexts. Authors of English language course books also need to consider how the text will affect vocabulary learning. If target words are encountered in contexts that are uninformative or misleading, supplementary tasks or contexts involving those words are likely to be necessary for learners to gain knowledge of meaning. It is also important that teachers are aware of the importance of the effects of context on incidental learning. Teachers need to scan texts beforehand, consider how the context may affect learning, and judge whether target words are likely or unlikely to be learned. Supplementing examples of target words in informative contexts may notably improve vocabulary learning. However, if incidental learning is not the aim of the task, it may be beneficial for teachers to pre-teach the meaning of items that are necessary for comprehension but unlikely to be learned because of the contexts in which they occur.

Nation (1982) points out that unless there is a clear definition of context in research, results may be misleading. The sizeable context effect found in this study reinforces this and indicates that a
better understanding of context is needed. Since there are so many different types of contexts used in incidental learning research, it is very unlikely that the results translate from one context to another. Certainly gains in knowledge are less likely to occur from reading a graded reader than from a passage created with sufficient clues to infer the meaning of unknown words.
Researchers need to be aware of the effects of context and take them into consideration when comparing the results from different studies, as well as when designing their own experiments.

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## Notes

1. One reviewer suggests that learning disguised forms for known words may have reduced the chances of correctly inferring the words in context.
2. The present study was part of a larger study that investigated the effects of repetition and context on vocabulary knowledge. The effects of repetition on vocabulary knowledge were discussed in Webb (2007a). It should be noted that there were 10 tests measuring knowledge of five aspects of vocabulary knowledge employed in the larger study. Because the present study relates to earlier research that has focused on meaning and form, only the first three tests measuring recall of form, recognition of form, and recall of meaning, and the $10^{\text {th }}$ test measuring recognition of meaning were discussed in this article. More information on the tests can be found in Webb (2005, 2007a, 2007b, 2007c).

## References

Beck, I. L., McKeown, M. G., \& McCaslin, E. S. (1983). Vocabulary: All contexts are not created equal. Elementary School Journal, 83, 177-181.
Day, R. R., Omura, C., \& Hiramatsu, M. (1991). Incidental EFL vocabulary learning and reading. Reading in a Foreign Language, 7, 541-551.
Dempster, F. N. (1987). Effects of variable encoding and spaced presentation on vocabulary learning. Journal of Educational Psychology, 79, 162-170.
Dupuy, B., \& Krashen, S. D. (1993). Incidental vocabulary acquisition in French as a foreign language. Applied Language Learning, 4, 55-63.
Gipe, J. P., \& Arnold, R. D. (1979). Teaching vocabulary through familiar associations and contexts. Journal of Reading Behavior, 11, 282-285.
Griffin, G. F. (1992). Aspects of the psychology of second language vocabulary list learning. Unpublished doctoral dissertation, University of Warwick, UK.
Herman, P. A., Anderson, R. C., Nagy, W. E., \& Pearson, P. D. (1987). Incidental acquisition of word meaning from expositions with varied text features. Reading Research Quarterly,

22, 263-284.
Horst, M., Cobb, T., \& Meara, P. (1998). Beyond A Clockwork Orange: Acquiring second language vocabulary through reading. Reading in a Foreign Language, 11, 207-223.
Hulstijn, J. H. (1992). Retention of inferred and given word meanings: Experiments in incidental vocabulary learning. In P. Arnaud \& H. Bejoint (Eds.), Vocabulary and applied linguistics (pp. 113-125). London: Macmillan.
Hulstijn, J., Hollander, M., \& Greidanus, T. (1996). Incidental vocabulary learning by advanced foreign language students: The influence of marginal glosses, dictionary use, and reoccurrence of unknown words. The Modern Language Journal, 80, 327-339.
Hunt, A., \& Beglar, D. (2005). A framework for developing EFL reading vocabulary. Reading in a Foreign Language, 17, 23-59.
Jenkins, J. R., Matlock, B., \& Slocomb, T. A. (1989). Two approaches to vocabulary instruction: The teaching of individual word meanings and practice in deriving word meanings from context. Reading Research Quarterly, 24, 215-235.
Jenkins, J. R., Stein, M. L., \& Wysocki, K. (1984). Learning vocabulary through reading. American Educational Research Journal, 21, 767-787.
Kucera, H., \& Francis, W. N. (1967). A computational analysis of present-day American English. Providence, RI: Brown University Press.
Laufer, B. (1991). The development of L2 Lexis in the expression of the advanced learner. The Modern Language Journal, 75, 440-448.
Laufer, B. (2001). Reading, word-focused activities and incidental vocabulary acquisition in a second language. Prospect, 16, 44-54.
Laufer, B., \& Paribakht, T. S. (1998). The relationship between passive and active vocabularies: Effects of language learning context. Language Learning, 48, 365-391.
Laufer, B., \& Shmueli, K. (1997). Memorizing new words: Does teaching have anything to do with it? RELC Journal, 28, 89-108.
Nagy, W. E., Anderson, R. C., \& Herman, P. A. (1987). Learning word meanings from context during normal reading. American Educational Research Journal, 24, 237-270.
Nagy, W. E., Herman, P. A., \& Anderson, R. C. (1985). Learning words from context. Reading Research Quarterly, 20, 233-253.
Nation, I. S. P. (1982). Beginning to learn foreign vocabulary: A review of the research. RELC Journal, 13, 14-36.
Nation, I. S. P. (2001). Learning vocabulary in another language. New York: Cambridge University Press.
Pickering, M. (1982). Context-free and context-dependent vocabulary learning: An experiment. System, 10, 79-83.
Pitts, M., White, H., \& Krashen, S. D. (1989). Acquiring second language vocabulary through reading: A replication of the Clockwork Orange study using second language acquirers. Reading in a Foreign Language, 5, 271-276.
Rott, S. (1999). The effect of exposure frequency on intermediate language learners' incidental vocabulary acquisition through reading. Studies in Second Language Acquisition, 21, 589-619.
Saragi, T., Nation, I. S. P., \& Meister, G. F. (1978). Vocabulary learning and reading. System, 6, 72-78.
Schmitt, N. (2000). Vocabulary in language teaching. Cambridge: Cambridge University Press.
Schmitt, N., Schmitt, D., \& Clapham, C. (2001). Developing and exploring the behaviour of two
new versions of the Vocabulary Levels Test. Language Testing, 18, 55-88.
Shu, H., Anderson, R. C., \& Zhang, Z. (1995). Incidental learning of word meanings while reading: a Chinese and American cross-cultural study. Reading Research Quarterly, 30, 76-95.
Waring, R., \& Takaki, M. (2003). At what rate do learners learn and retain new vocabulary from reading a graded reader? Reading in a Foreign Language, 15, 1-27.
Webb, S. (2005). Receptive and productive vocabulary learning: The effects of reading and writing on word knowledge. Studies in Second Language Acquisition, 27, 33-52.
Webb, S. (2007a). The effects of repetition on vocabulary knowledge. Applied Linguistics, 28, 46-65.
Webb, S. (2007b). The effects of synonymy on vocabulary learning. Reading in a Foreign Language, 19, 120-136.
Webb, S. (2007c). Learning word pairs and glossed sentences: The effects of a single sentence on vocabulary knowledge. Language Teaching Research, 11, 63-81.
Webb, S. (2008). Receptive and productive vocabulary sizes of L2 learners. Studies in Second Language Acquisition, 30, 79-95.

## Appendix A

## Encounter 1

- He was not ill, and of course the beds in the ancon are for ill people.
- He can read and faddam, and he thinks a lot.
- And in London, hundreds of people were waiting at King's Cross Station for the masco from Harrogate.
- He insisted on paconing a bright yellow sports jacket and diamond tie-pin while serving lunch.
- I don't want to be rich, but I do want to come to Australia and sagod you and Mollie and my grandchildren.
- Don't you denent you promised you would never leave me?
- After paying the driver and getting out, he suddenly realized how dark and dirty the narrow dangies were.
- He had cader and tea with Mrs. Walsh in the kitchen, and he felt really happy.
- As she stood up to see if her bag was all right, she saw her hodet in the mirror - white, with big, round eyes.
- Archie stayed for the rest of the afternoon, and for supper that tasper.


## Encounter 2: More informative contexts

- Perhaps I had a Christmas with my mother once, but I do not denent it.
- So John had to walk back through the dangies in the middle of the night, all wet from the sea, while we laughed at him from the car.
- The first time Mary and the children laughed together, John felt a big smile come onto his hodet.
- Time passed slowly in the ancon, where the patients played cards, and slept, and told each other stories.
- She was paconing a white coat with a lot of pens in the top pocket.
- I sagoded him every day, and talked to him.
- I've ordered some champagne and some cader for us.
- There are no long taspers in our New Zealand days; the sun goes down and half an hour later it's
night.
- She asked a lot of people a lot of questions and always faddamed the answers in her notebook.
- Agatha still only eighteen years old went to London on the masco.


## Encounter 3: More informative contexts

- Children played in the narrow dangies.
- On her last day, Mary and John had cader in the factory restaurant together.
- She remembered seeing a beautiful young girl in a hotel in Cairo when she was sagoding Egypt with Clara.
- We liked to talk to him, and we are all very sorry because he is dead. A lot of people are going to denent him for a long time.
- Their friends were paconing white clothes, with Greenworld written on them.
- I could not see his hodet or his body.
- Bob Tappin and Bob Leeming played music in the hotel each tasper, and both of them watched the quiet woman in the corner of the room and began to think.
- I am a doctor at the London Ancon.
- Your brother faddamed his name on this paper.
- The masco began to go more slowly. It gave a long whistle. They were coming to a town.


## Encounter 2: Less informative contexts

- They were all paconing white gloves and their hands were inside a big glass box.
- At the corner of the dangy she met Laurie.
- I did not talk to him very much at the ancon. I looked at his head and arms and legs and body very carefully.
- They danced together many times that tasper, and Archie told her his plans.
- Then a cat came to sagod me - a beautiful cat - and then a dog.
- Then Simon stood up to say something. "Mr Duncan," he said. "I'll always denent this night."
- Everyone on the masco and the ship looked at him, and laughed at him.
- Paul found the Minister sitting alone in the garden after cader, smoking a large cigar, his big red hands folded over his large stomach, a soft hat over his eyes.
- "Why don't you faddam another book?" said Archie.
- His hodet was red and he looked at his shoes.


## Encounter 3: Less informative contexts

- I want to read what she faddamed to her dear husband.
- As soon as he could walk, he left the ancon and started looking for a ship to take him back to England.
- After cader we sat and talked for a while.
- His hodet was shining, excited, happy.
- Her brother Edward was always with her when the King came to sagod.
- Perhaps this happened. Or perhaps she's ill and can't denent who she is.
- During the tasper, she talked to some people who were just back from Baghdad, in Iraq.
- Big white clouds over the white dangies - and sunshine everywhere.
- The masco left the station and rushed into the dark.
- I don't know anything about art, and I haven't met any grand people, and I don't pacon expensive clothes, but up to now, none of that has worried me.


#### Abstract

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