The effects of synonymy on second-language vocabulary learning

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Abstract

This article examines the effects of synonymy (i.e., learning words with and without high-frequency synonyms that were known to the learners) on word knowledge in a study of 84 Japanese students learning English. It employed 10 tests measuring 5 aspects of word knowledge (orthography, paradigmatic association, syntagmatic association, meaning and form, and grammatical functions) to assess learning. Both receptive and productive tests were used to measure each aspect of vocabulary knowledge. The participants encountered target words in 2 learning conditions: glossed sentences and word pairs. The results showed that the learners had significantly higher scores for the words that had known synonyms on productive knowledge as measured using syntagmatic association and paradigmatic association tests and on receptive knowledge as measured using an orthography test. The findings indicate that learning synonyms for known words may be easier than learning words that do not have known synonyms.

Keywords: incidental learning, synonymy, vocabulary knowledge, word pairs, glossed sentences

Very little research has investigated the effects of synonymy on vocabulary learning. Higa (1963) found that learning two synonyms at one time is more difficult than learning two unrelated words, and synonymy has been listed as one of several factors that can make words more difficult to learn (Laufer, 1990). However, to my knowledge, no studies have examined the difficulty of learning a synonym for a known word versus that of learning a non-synonym. This is surprising because learning the synonyms of known words is a very common occurrence in vocabulary learning, and intuitively and logically, learning a synonym would be easier than learning a non-synonym. It is understandable, however, because students tend to learn the majority of synonyms in the later stages of vocabulary learning, and researchers are more focused on the earlier stages of vocabulary learning, which are critical to language acquisition. Moreover, in the classroom, teachers and learners might be more motivated to teach and learn words that convey new information rather than teaching and learning forms that convey information similar to what learners already know. The similarity between synonyms, however, may make learning the synonyms of known words easier than learning words without known synonyms. Overlaps in collocation, syntagmatic and paradigmatic associations, grammatical functions, and meaning and form between synonyms may help to facilitate vocabulary acquisition.

The present study was designed to determine whether learning synonyms for known second-language (L2) words is easier than learning non-synonyms. The reason for this was not to advocate the teaching of synonyms but rather to improve our understanding of the vocabulary acquisition process. If words with known synonyms are learned more easily than words without known synonyms, learning new words would become easier as a learner's vocabulary size increases because more and more words are likely to have known synonyms. Vocabulary difficulty would thus be affected by the amount of prior learning. Learners with larger vocabularies would be able to learn words more easily than learners with smaller vocabularies because increased vocabulary knowledge would help to facilitate learning.

Literature Review

In the only study that investigated the effects of synonymy on vocabulary learning, Higa (1963) found that pairs of synonyms took longer to learn than pairs of unrelated words. The results suggested that learners are more likely to confuse words that are similar in meaning than words that do not have close semantic links. Higa (1963, 1965) reported that the closer the semantic relationship between words, the more difficult it may be to learn the words in a set. Studies by Tinkham (1993) and Waring (1997) also indicate that learning sets of semantically related words is more difficult than learning words that are not linked by meaning. Together, these studies suggest that learning synonyms together may reduce the likelihood of acquisition. While this is a very useful finding, it may not apply to the way in which synonyms are usually learned. Teachers are unlikely to teach pairs of unknown synonyms together for the simple reason that it is confusing for learners, as Higa's research suggests, and learners are unlikely to learn synonyms together because they may lack the motivation to learn two words that convey similar information. Instead, a synonym for a known word may be easier to learn in the later stages of vocabulary learning. At present, no research appears to have investigated the difficulty of learning the synonyms of known words versus learning non-synonyms.

Laufer (1990) reported that synonymy is one of seven interlexical factors that can reduce the chances of vocabulary acquisition. She gave two reasons that synonyms may be more difficult to learn than other words. First, learners often make mistakes using synonyms because some of them may be substituted effectively in some contexts but not in others. For example, *strong* and *powerful* have similar meanings, but usually tea is only *strong*, and engines may be *powerful* but are rarely *strong*. This is an important point and demonstrates that some synonyms might be more difficult to learn than others because synonyms with similar meanings do not always have the same collocates. Certainly, some words such as *good* and *nice* are synonymous in many contexts, while others such as *powerful* and *strong* are synonymous to a lesser degree. The second reason she gave is that less advanced learners are unlikely to try to learn words with similar meanings when they have a greater need to learn unknown L2 meanings.

Learning words with known synonyms may be easier than learning words without known synonyms because learners may be able to transfer their knowledge of syntax and collocation from known synonyms to less frequent synonyms. Typically, when learning a non-synonym, L2 learners use their first language (L1) knowledge of that item and information from the context in which it was encountered to help learn that word. While on some occasions, this combination of

L1 and L2 knowledge may be sufficient to use or understand the word quickly, more often, learning the word is likely to be a slow process that involves repeated encounters of the word in context. Learning the synonyms of known words may be faster than learning non-synonyms because learners may gain substantial L2 vocabulary knowledge from known synonyms. Learners may gain L2 knowledge of syntagmatic association and collocation, paradigmatic association, and grammar from known synonyms. A transfer of L2 knowledge from known words to their less-frequent synonyms could make using and understanding the synonyms relatively easy.

Nation's (2001) discussion of "learning burden" also suggests that learning a synonym for a word that is already known may be easier than learning a non-synonym. He argued that the amount of effort required to learn a word is different for different words and for different learners. He referred to the effort needed to learn a word as its learning burden and stated

> The general principle of learning burden is that the more a word represents patterns and knowledge that the learners are already familiar with, the lighter its learning burden. These patterns and knowledge can be from the first language, from knowledge of other languages, and from previous knowledge of the second language. So, if a word uses sounds that are in the first language, follows regular spelling patterns, is a loan word in the first language with roughly the same meaning, fits into roughly similar grammatical patterns as in the first language with similar collocations and constraints, then the learning burden will be very light. (pp. 23–24)

The concept of learning burden provides a reasonable explanation as to why L2 words that have known L2 synonyms may be easier to learn than those that do not. Synonyms may represent different aspects of knowledge that have already been acquired. For example, if learners are faced with learning the low-frequency words *revolver* and *spear*, learning *revolver* may be easier because it has a high-frequency synonym (*gun*) that represents vocabulary knowledge that can be used to learn *revolver*. The word *revolver* can be substituted for *gun* in many sentences, allowing learners to produce sentences such as *he held the revolver tightly in his hand*, *he pointed the revolver and fired*, and *she took out her revolver and shot him three times in the head*. If a newly learned word can be substituted in a sentence for a known synonym, then collocations and syntagmatic associates might be acquired when meaning and form are learned. Because *spear* does not have a high-frequency synonym, a greater amount of vocabulary knowledge may need to be acquired, and therefore, it may be more difficult to produce in a sentence. Although the degree of overlap of vocabulary knowledge varies from synonym to synonym, at least partial overlap may help facilitate acquisition.

Further research examining the difficulty of learning words that have known L2 synonyms versus learning words that do not would be valuable for three reasons. First, it would help researchers better understand the vocabulary acquisition process. If vocabulary knowledge gained from knowing words may facilitate the future learning of their synonyms, unknown words may become easier to learn as a person's vocabulary develops. Second, it would provide some support for L2 incidental vocabulary learning through reading. L2 research has shown that learners may incidentally acquire vocabulary through reading and suggests that it may play a large role in L2 vocabulary development (Day, Omura, & Hiramatsu, 1991; Dupuy & Krashen,

1993; Pitts, White, & Krashen, 1989). However, little evidence supports the position that incidental learning is responsible for the huge number of words acquired in L1 learning. L2 studies examining incidental learning have shown that vocabulary gains are extremely small and that incidental learning is a gradual process in which repeated encounters in context are needed to learn words (Horst, Cobb, & Meara, 1998; Rott, 1999; Waring & Takaki, 2003). As a learner's vocabulary increases, the number of synonyms for known words that they learn is also likely to increase. If learning the synonyms of known words is easier than learning words without known synonyms, it would help to explain how some L2 learners may incidentally learn great numbers of words in the later stages of language learning through reading and listening. Third, determining whether synonyms are acquired more easily than other words would be very useful for teachers and learners. Knowing which words are easier or more difficult to learn would allow them to develop more efficient vocabulary teaching and learning strategies.

The present study was designed to investigate the effects of synonymy on vocabulary learning. Two sets of target words—10 low-frequency words with high-frequency synonyms and 10 low-frequency words without high-frequency synonyms—were used to determine whether words with high-frequency synonyms are more easily learned than non-synonyms. Disguised forms replaced the L2 forms of the target words to eliminate the possibility that the learners knew the target words. The target words were learned in two tasks: learning word pairs and learning glossed sentences. The effects of the two tasks on the different aspects of vocabulary knowledge are discussed in detail in Webb (2007). Using L2 target words with high-frequency synonyms allowed the participants the possibility of gaining L2 knowledge from their L1 translations, their L2 synonyms, and the contexts in which they were presented in the glossed learning task. In contrast, using target words without high-frequency synonyms ensured that participants could only gain knowledge of those words from their L1 translations or the glossed sentences. Because synonymy may affect several aspects of vocabulary knowledge, each target word was tested in 10 different ways. The tests were designed to measure receptive and productive knowledge of (a) orthography, (b) syntagmatic association, (c) paradigmatic association, (d) grammatical functions, and (e) meaning and form. Researchers tend to agree that knowing a word is much more than simply knowing its meaning (Aitchison, 1994; Laufer, 1997; McCarthy, 1990; Miller, 1999; Nation, 1990, 2001; Richards, 1976), and measuring multiple aspects of vocabulary knowledge may provide a more accurate assessment of the effects of synonymy on vocabulary knowledge than simply testing meaning.

Specifically, the present study examined the following questions:

> 1. Are synonyms for known words easier to learn than words that do not have known synonyms?

> 2. How are different aspects of vocabulary knowledge affected by synonymy? If learners can substitute a synonym for a word in a text, the learners could be expected to score higher on tests measuring knowledge of syntagmatic association, paradigmatic association, and grammatical functions for target words with known synonyms than target words without them.

Method

Participants

The participants were 84 Japanese students of English as a foreign language from two first-year classes at a university in Fukuoka, Japan. All of the students had scored 80% or higher on the 2000-word level of Version 1 of the Vocabulary Levels Test (Schmitt, 2000). Their average raw 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 2,000 most frequent words (Schmitt, Schmitt, & Clapham, 2001).

Design

Two sets of words were used: 10 low-frequency words with high-frequency synonyms and 10 low-frequency words without high-frequency synonyms. Disguised forms replaced the L2 forms of the low-frequency words and were matched with their L1 meanings to create the target words used in the experiment. Using the disguised forms ensured that the participants would have no prior knowledge of the target words. The use of the disguised forms also eliminated the need to use pre-tests. Pre-tests may not be sensitive enough to measure for partial knowledge of target words and may also tip students off as to the nature of a study.

The participants were randomly assigned to two learning conditions. In one condition, the participants encountered the target words in glossed sentences, and in the other, the participants encountered the target words in word pairs. In each condition, the participants attempted to learn all 20 target words. The participants were given 8 minutes to learn the target words in both conditions. After the conclusion of the treatment, 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 experiment was conducted within one 90-minute class period.

Materials

Target words. Twenty low-frequency words were selected from the fifth frequency band in the COBUILD dictionary. It accounts for the 6,601st to 14,700th most frequent words. Ten were low-frequency words with high-frequency synonyms, and the other 10 were low-frequency words without high-frequency synonyms. Both sets of target words comprised six nouns and four verbs. This ratio of nouns to 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 & Francis, 1967). The target words with high-frequency synonyms were *locomotive*, *visage*, *lane*, *abode*, *boulder*, *crave*, *doze*, *sob*, *abhor*, and *dagger*. The target words without high-frequency synonyms were *lick*, *spear*, *recluse*, *pawn*, *landfill*, *mourn*, *convent*, *pier*, *reef*, and *marinate*.

Two sets of 10 disguised forms were created and replaced the L2 forms of the 20 low-frequency words. All of the disguised forms were two syllables and resembled English words phonetically and orthographically. Because the participants could have mistaken 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. Because the participants in the experiments did not know 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 *ancon*, *cader*, *dangy*, *denent*, *faddam*, *hodet*, *masco*, *pacon*, *sagod*, *tasper*, *copac*, *gishom*, *hattaw*, *ictay*, *mesut*, *nasin*, *nuggy*, *tagon*, *toncop*, and *dapew*.

Two versions of each learning condition were prepared to ensure that the disguised forms paired with one set of target words were not easier to learn than the other set of disguised forms. The first version of the learning tasks presented the first 10 disguised forms (*ancon*, *cader*, *dangy*, *denent*, *faddam*, *hodet*, *masco*, *pacon*, *sagod*, and *tasper*) paired with the L1 meanings of the words with high-frequency synonyms and the second 10 disguised forms (*copac*, *gishom*, *hattaw*, *ictay*, *mesut*, *nasin*, *nuggy*, *tagon*, *toncop*, and *dapew*) paired with the L1 meanings of the words without high-frequency synonyms. In the second version, the pairings were reversed. Because the disguised forms used in the experiment were the same for both sets of target words (using two versions of each task), the factors affecting word difficulty—pronounceability, orthography, morphology, and synformy—could not affect any differences found between the variables. Two other factors affecting word difficulty, specificity and register constraints, are more likely to affect the later stages of acquisition and were therefore unlikely to be a factor in this study. To ensure that idiomaticity and multiple meanings did not influence vocabulary learning, none of the disguised forms encountered in sentence contexts involved idioms and only one sense of a target word's L1 and L2 meaning was presented in the contexts.

Tasks

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

masco 機関車

The order of the word pairs, those with and without high-frequency synonyms, was controlled to ensure that it did not affect learning. The target words with high-frequency synonyms were alternated with the target words without high-frequency synonyms. For half of the participants, a disguised form with a high-frequency synonym was presented first. For the others, a disguised form without a high-frequency synonym was first.

Sentence contexts. In the task of learning from glossed sentences, the 20 target words were presented with their L1 meanings and one sentence containing each target word followed each word pair (see Appendix). The following example is for the target word *masco*, which was matched with the L1 meaning of *locomotive*:

masco 機関車 The driver got off the <u>masco</u>.

The sentences were selected from the British National Corpus. Pilot studies and the participants' scores on the Vocabulary Levels Test indicated that the participants would know all of the running words in the sentences and would be able to quickly understand the sentences. The order of the contexts was controlled in the task. Half of the participants received contexts containing target words with high-frequency synonyms first, and half of the participants received contexts without high-frequency synonyms first.

Dependent measures

Ten tests measuring knowledge of orthography, paradigmatic association, syntagmatic association, grammatical functions, and meaning and form were administered after the treatment. Each test was created to isolate a specific aspect of knowledge. Five of the tests measured productive knowledge, and five measured receptive knowledge. The tests were carefully sequenced to avoid earlier tests affecting the participants' answers on later tests. Each test was on one page. The first test, measuring productive knowledge of orthography, was administered to all of the participants 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. Webb (2005) described the tests as follows:

Test 1: Productive knowledge of orthography. On the first test the learners heard each disguised form pronounced twice and then had 10 seconds to write it correctly. Any spelling mistakes caused an answer to be 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 whether the spelling was due to the learning task or the aural prompt could not be determined. On all of the other productive tests, spelling was not a determining factor in the scoring if the response could be clearly understood.

Test 2: Receptive knowledge of orthography. On the second test 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) dungie   (d) dangy
     (a) hodet   (b) holat   (c) halet   (d) hedet

Usually, all productive tests need to be completed before receptive tests to avoid a learning effect. However, the receptive test of orthography was highly unlikely to contribute to a learning effect in this study for two reasons: the target words were used as cues on three of the four remaining productive tests, and 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.

Test 3: Productive knowledge of meaning and form. On the third test, productive knowledge of

meaning and form was measured using 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 forms of the target words with their L1 meanings. For example, to get the following answer correct, the learners had to write the target disguised form *masco* beside the L1 translation with which it was paired.

　　　　機関車_____

Because the aim of the first two tests was to determine whether 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 on this test. Therefore, spellings that demonstrated that the learners could link an 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. Close approximations that were real English words were marked as incorrect because whether the participants had intended to write the target words could not be ascertained.

Test 4: Productive knowledge of grammatical functions. This was essentially a sentence construction test. The learners were cued with the target words and had to write each one in a sentence. The instructions made clear that the 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 in *The girl mascoed to school* and correct in both *The masco left the station early* and *It is a masco*.

Test 5: Productive knowledge of syntagmatic association. In word association research, responses are often classified as either paradigmatic (demonstrating productive knowledge of the semantic relationships between words) or syntagmatic (demonstrating productive knowledge of syntax; Soderman, 1993). On this test the learners had to produce L2 syntagmatic associates 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 encountered 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. Two native speakers of English evaluated the responses. Their inter-rater reliability was 94%. Because the following test measured productive knowledge of paradigmatic association, paradigmatic associates were marked as incorrect. This was carefully explained in the instructions.

Test 6: Productive knowledge of paradigmatic association. In this test 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 acceptable responses for *masco* (locomotive) are *train*, *airplane*, and *vehicle*. Two native speakers of English evaluated the responses, and their inter-rater reliability on this test was 98%.

Test 7: Receptive knowledge of grammatical functions. A multiple choice test was used to

measure receptive knowledge of grammatical functions. The learners were presented with three sentences containing each target word and had to choose the correct one. 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, the receptive test of grammatical functions needed to be 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 in the following example.

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

Test 8: 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 parts of speech as the correct answers. 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

Test 9: 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 parts of speech as the correct answers. This is illustrated for the target words *dangy* (boulder) and *hodet* (lane) in the following examples.

dangy   (a) stone   (b) plant   (c) tree   (d) person
hodet   (a) park   (b) highway   (c) garden   (d) building

Test 10: Receptive knowledge of meaning and form. This was a receptive translation test in which the target words cued responses in the L1. 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 _____

Results

The descriptive statistics (means, standard deviations, and numbers of participants) of the vocabulary knowledge scores on the 10 dependent measures for words with and without high-frequency synonyms are reported in Table 1. A repeated measures MANOVA was performed

using the scores on the 10 dependent measures to analyze the within-subjects factor (synonymy—words with and without known synonyms), and the two between-subjects factors (test version and learning condition). The MANOVA showed an overall statistically significant difference for synonymy, $F(10, 71) = 9.74$, $p < .001$, $\eta^2 = .58$. However, the different versions of the treatment showed no significant difference, $F(10, 71) = 1.50$, $p = .16$, $\eta^2 = .17$, nor did the learning conditions, $F(10, 71) = 1.50$, $p = .59$, $\eta^2 = .11$.

Table 1. *Means and standard deviations of learning conditions on dependent measures for words with and without high-frequency synonyms*

		Word pairs (N = 43)		Context (N = 41)		Word pairs and context combined (N = 84)	
		M	SD	M	SD	M	SD
PO	Synonyms	5.56	(2.24)	5.37	(2.61)	5.46	(2.41)
	Non-synonyms	5.42	(2.27)	4.95	(2.52)	5.19	(2.39)
RO	Synonyms	7.53	(2.02)	7.71	(1.82)	7.62	(1.91)
	Non-synonyms	7.16	(2.16)	7.12	(2.01)	7.14	(2.08)
PM	Synonyms	5.51	(2.85)	5.41	(2.59)	5.46	(2.71)
	Non-synonyms	5.70	(2.73)	5.05	(2.86)	5.38	(2.80)
RM	Synonyms	5.60	(2.93)	6.05	(2.77)	5.82	(2.85)
	Non-synonyms	5.56	(2.81)	5.78	(3.11)	5.67	(2.94)
PA	Synonyms	4.88	(2.58)	5.37	(2.77)	5.12	(2.67)
	Non-synonyms	3.47	(2.21)	3.51	(2.66)	3.49	(2.42)
RA	Synonyms	5.95	(2.50)	6.66	(2.09)	6.30	(2.32)
	Non-synonyms	6.05	(2.54)	6.27	(2.31)	6.15	(2.42)
PS	Synonyms	4.37	(2.64)	4.27	(2.76)	4.32	(2.68)
	Non-synonyms	3.74	(2.51)	3.39	(2.31)	3.57	(2.41)
RS	Synonyms	5.98	(2.61)	6.56	(2.26)	6.26	(2.45)
	Non-synonyms	5.72	(2.58)	6.78	(2.13)	6.24	(2.41)
PG	Synonyms	4.88	(2.76)	5.12	(2.64)	5.00	(2.69)
	Non-synonyms	4.91	(2.78)	4.71	(3.04)	4.81	(2.90)
RG	Synonyms	6.86	(2.60)	7.66	(1.62)	7.25	(2.20)
	Non-synonyms	6.95	(2.49)	7.15	(2.07)	7.05	(2.28)

Note. Maximum score = 10. 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.

The results of the MANOVA indicate that synonymy may facilitate an increase in vocabulary knowledge. Significant differences were found on the productive tests of paradigmatic association, $F(1, 80) = 75.30$, $p < .01$, $\eta^2 = .49$, and syntagmatic association, $F(1, 80) = 13.06$, $p < .01$, $\eta^2 = .14$, and the receptive test of orthography, $F(1, 80) = 5.15$, $p < .05$, $\eta^2 = .06$. A summary of the findings on the repeated measures MANOVA is shown in Table 2.

Table 2. *Summary of multivariate analysis of variance on vocabulary tests for all participants (word pairs and context combined)*

Source	df	F	p	η²	K-R 21
PO	1	1.75	.19	.02	.78
RO	1	5.15*	.03	.06	.72
PM	1	0.36	.55	.01	.86
RM	1	1.25	.27	.02	.89
PA	1	75.30**	.00	.49	.83
RA	1	0.63	.43	.01	.80
PS	1	13.06**	.00	.14	.83
RS	1	0.02	.89	.00	.81
PG	1	1.32	.25	.02	.87
RG	1	1.35	.25	.02	.81
Error	80				

Note. Maximum score = 10. 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.
*p < .05, **p < .01.

Discussion

The results indicate that synonymy may facilitate vocabulary learning. The scores were significantly higher for words with known synonyms than those without. Significantly higher scores were found on the productive tests of paradigmatic association and syntagmatic association and the receptive test of orthography.

That the scores were higher on the productive test of paradigmatic association is not surprising because synonyms were one of the types of paradigmatic associates that were scored as correct. However, the higher scores on the tests of syntagmatic association and orthography provide evidence that learners may acquire knowledge of synonyms more easily than non-synonyms. The results were supported by comments made by participants in pilot studies and case studies. When asked which items were easier to use in sentences, the majority of the participants selected items from the set of words with known synonyms. Similarly, when asked to select the easiest and most difficult words to learn, they usually chose synonyms for the easiest and non-synonyms for the most difficult. However, it should also be noted that the small effect sizes on those tests indicate that the pedagogical significance of the results may be relatively small. The lack of a significant difference on the tests of meaning may be attributed to the learning conditions. Because the participants were given the meanings of the target words in the treatments, the scores for synonyms and non-synonyms showed little difference. Investigating the effects of synonymy in an incidental learning task may show that meaning is also affected by synonymy. This would be an interesting and useful follow-up to this study.

The results on the productive test of syntagmatic association might be attributed to a transfer of

L2 knowledge from more to less frequent synonyms. This might occur if learners use L2 knowledge of more frequent synonyms as models for less frequent ones. For example, for the target word *masco*, the participants were given the L1 meaning of *locomotive*. In this case, the learners might have used a more frequent L2 synonym such as *train* as a model. Because they were likely to have had syntactic knowledge of *train*, they could have used that knowledge to produce syntagmatic associates such as *tracks*, *station*, and *left*, which are correct for both *train* and *locomotive*. In contrast, learners may only be able to use their L1 knowledge of words without known synonyms to produce syntagmatic associates. While L1 knowledge may also lead to correct responses, the combination of L1 and L2 knowledge for words with known synonyms may lead to significantly greater knowledge of syntagmatic association. Therefore, if learners realize that an unknown word has a more frequent synonym, a transfer of knowledge may help to facilitate learning. If one considers low-frequency words such as *lane*, *doze*, and *sob*, thinking of words that would appear with them in context is quite easy despite the fact that they are relatively uncommon. This might be because they can be substituted into some of the common contexts in which their more frequent synonyms, *street*, *sleep*, and *cry*, occur. However, producing syntagmatic associates may not be quite as easy for low-frequency words such as *recluse*, *pawn*, and *pier*, which do not have high-frequency synonyms, because no more common words can be used as models. For learners, overlap between L1 and L2 knowledge may contribute to an increase in L2 knowledge for words without known synonyms; however, the combination of L1 and L2 knowledge of higher-frequency synonyms is likely to lead to increased learning.

The results provide evidence supporting Nation's (1990, 2001) theory of learning burden. Nation suggested that the more a word represents knowledge that is already known, the more easily it will be learned. My results indicate that the learning burden for synonyms of known words is less than for non-synonyms because synonyms represent knowledge of syntagmatic association that has already been acquired. This is a very useful finding, suggesting that learning burden might be an important criterion when teaching or learning vocabulary. If teachers are aware that a word's learning burden may determine how quickly it is acquired, they may be able to produce a much more efficient vocabulary-learning curriculum. For example, spending more time teaching words that do not have known synonyms than those that do may be more effective because words with more frequent synonyms may be learned more easily. Teachers and learners should also be aware that teaching and learning strategies that strengthen the links between synonyms may improve learning. While research has shown that learning synonyms together is not as effective as learning unrelated words (Higa, 1963), learning the synonyms for known words or being aware that two words are synonymous may facilitate learning.

While the results suggest that words with known synonyms are easier to learn than those without, the results do not necessarily discount Laufer's (1990) argument that synonyms are more difficult to learn than non-synonyms. The reason for this is that the present study investigated initial or partial vocabulary learning, while Laufer was referring to gaining full knowledge of a synonym. Both theories could prove correct. Once learners have acquired knowledge of the meaning of a word with a known synonym, they may instantly gain partial knowledge of its paradigmatic association, grammar, and syntagmatic association if they can link it with its synonym. This is an important gain in knowledge because it may provide learners with enough vocabulary knowledge to use the word. However, this development may soon be impeded if

errors occur when the word is used. Because few synonyms can be substituted in every context, at some point, a newly acquired synonym is likely to be used incorrectly. At this time, learners may be discouraged from using synonyms, and gains in knowledge could be delayed to the point that the acquisition of non-synonyms could progress more quickly. However, the acquisition of synonyms could also progress at a normal pace, with learners gaining receptive knowledge through meetings in context and productive knowledge through trial and error. In fact, the same argument can be used for words without known synonyms. My results suggest that learners may also make large initial gains in paradigmatic and syntagmatic association by linking L2 forms to L1 meanings. The degree of overlap of L1 and L2 meanings and syntagmatic association may determine how easily a word is learned. Initial gains in knowledge followed by drops in performance and then a return to target-like use may be quite common in L2 learning and is what Kellerman (1985) referred to as "U-shaped behavior."

The results demonstrate the importance of measuring different aspects of word knowledge. In most research investigating vocabulary acquisition, only one aspect of vocabulary knowledge, meaning and form, has been measured. While knowledge of meaning and form is measured for good reason, sometimes it is a poor choice. For example, in the present study, I had reason to believe that knowledge of syntagmatic association and grammatical functions may have been more affected by synonymy than meaning and form. I had little reason to think that the L1 meanings would be easier to link to the L2 forms of synonyms than non-synonyms because both tasks provided that information for all target words. However, intuitively and logically, synonyms are easier to use in sentences than non-synonyms. While measuring many different aspects of vocabulary knowledge may not be practical, researchers should carefully consider the aspects that are most likely to be affected by an independent variable instead of simply measuring knowledge of meaning.

Taken as a whole, the results are valuable because they may shed light on the incidental learning process. L1 and L2 research investigating incidental learning through reading suggests that learners gain vocabulary knowledge in small increments and that they build upon their previous gains through repeated exposures (Day, Omura, & Hiramatsu, 1991; Dupuy & Krashen, 1993; Horst, Cobb, & Meara, 1998; Hulstijn, 1992; Jenkins, Stein, & Wysocki, 1984; Nagy, Anderson, & Herman, 1987; Nagy, Herman, & Anderson, 1985; Pitts, White, & Krashen, 1989; Rott, 1999; Shu, Anderson, & Zhang, 1995). While incidental learning is widely accepted to account for the vast majority of L1 words that are learned, research has done little but show that learners may acquire words extremely slowly through reading. In fact, one of the stronger arguments—the default learning hypothesis (Jenkins, Stein, & Wysocki, 1984)—for incidental learning has simply been that explicit methods cannot account for the gains needed to develop an adult vocabulary. The findings from the present study, which showed that some low-frequency words may be acquired faster than others, may help to explain why research has not been able to show how incidental learning is able to account for the extraordinary number of words that are learned. Transfer of knowledge between synonyms may facilitate learning; however, this transfer is more likely to occur in the later stages of vocabulary development when learners know more words and are more likely to be learning the synonyms of known words. If words with lower learning burdens such as words with known synonyms are acquired more easily than those with higher learning burdens, then words are likely to become easier to learn as a learner's vocabulary increases. The reason for this is that in the later stages of both L1 and L2 lexical development,

there is likely to be less to learn about each unknown word.

In the earliest stages of vocabulary learning, each word may represent more knowledge that needs to be gained to use or understand it than in the later stages of learning. For example, in the earlier stages of vocabulary development, spelling or pronouncing a new word may be difficult. Words that appear together with a new word may still be unknown, so producing an item in context may be difficult. Word parts such as affixes need to be learned, and when, where, and how often a new word should be used might be a mystery. Nation's (2001) list of the nine different aspects of word knowledge shows how much knowledge is needed to know a word. In the initial stages of lexical development, gaining the knowledge needed to know words may be overwhelming. However, as more and more words are learned, a cumulative gain in vocabulary knowledge may facilitate vocabulary acquisition and make future vocabulary learning less difficult. Familiarity with spelling, pronunciation, word parts, and grammar may decrease the amount of knowledge that needs to be gained to know a word. The larger a person's vocabulary, the more likely that unknown words will represent knowledge that has already been gained. This in turn may make it easier to use and understand new words. The cumulative gains in vocabulary knowledge may explain why adult native speakers and proficient L2 learners may acquire new words relatively quickly. While one reason may be that proficient L1 and L2 learners do not encounter as many unknown words and can therefore devote more energy to learning a new word, they are also likely to be able to learn words more quickly because they have already acquired knowledge that can be transferred and applied to new words.

Further research examining the effects of synonymy in a condition of incidental learning through reading would be a useful follow-up to this study. If research could show that words are easier to incidentally learn through reading for learners with larger vocabularies than for learners with smaller vocabularies, it would be a powerful argument for increasing the amount of reading done by advanced and possibly intermediate L2 learners. Moreover, determining if there is a vocabulary threshold at which words may be more easily incidentally learned through reading would also be of great benefit. For example, if learners who know the most frequent words are more likely to incidentally acquire unknown items than learners who know fewer words, the vocabulary threshold at which this may occur would be useful to determine. It could determine a point at which teachers of English as a foreign language could move from explicit vocabulary methods to focus more on incidental learning through reading.

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Appendix

Glossed Sentences

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 質に入れる (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 うとうとする (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 (abhor) We do **sagod** dust and dirt, and dirt in the bathtub.

About the Author

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