

Word Associations of Inexperienced and Experienced Learners of English and Japanese: Toward a Fuller Understanding of Lexical Storage and Retrieval in Second Language Learning and Teaching

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The present research uses McCarthy's (1990) word association task (WAT) to examine how English and Japanese speakers organize words in their mental lexicons, both in their first language (L1) and second language (L2). Drawing on word association (WA) research and some original classifications, this study categorizes 720 associations of 18 participants into lexical categories, followed by examination of WA behavior across languages and L2 ability levels. The results revealed that younger native English speakers' associations were more meaning based in both their L1 and limited L2, while younger native Japanese speakers inexperienced in English gave more position-based associations in both languages. Older, L2-experienced participants' associations were more balanced but overall more position based. These trends diverge from WA research that has been limited to English WATs and student participants, prompting discussion of L2 influence on older participants' lexical relations, as well as the influence of significantly different methods of L1 vocabulary instruction in English versus Japanese educational environments.

本論は、McCarthy(1990)の単語連想課題(WAT)を用いて、英語話者と日本語話者が、第一言語(L1)と第二言語(L2)の両方において、どのように心的辞書に単語を整理しているかを明らかにする。この研究では、単語連想(WA)研究といくつかの独自の分類をもとに、18名の参加者の720の連想単語を語彙カテゴリーに分類し、その後、言語とL2の能力レベルを横断してWAの行動を検討した。その結果、英語を母語とする若年者の連想は、母語でも限られたL2でも意味ベースであるのに対し、日本語の母語話者で英語の経験が少ない若年参加者の連想は、どちらの言語でも位置ベースであることが明らかになった。年配でL2経験が豊富な参加者の連想はよりバランスが取れていたが、全体的には位置ベースであった。これらの傾向は、英語WATや学生参加者に限定されたWA研究とは異なるものである。そして、年配参加者の語彙間の関係性に対するL2の影響や、英語と日本語の教育環境におけるL1語彙指導方法の有意な違いの影響についての議論を促すものである。

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When responding to the word “spring” with the next word that comes to mind in a word association (WA) exercise, most English speakers provide words such as “fall”, “flowers”, or “season” (De Deyne et al., 2018). Interaction with locals in Japan points to the association of *haru* (“spring”) with *sakura* (“cherry blossoms”), an association which may gain prominence in native Japanese speakers' first language (L1) lexical development due to their custom of *hanami*, or “cherry blossom viewing”, each spring. Associations such as “spring” → “fall” and “spring” → “cherry blossoms” provide a glimpse into the organization of words in language users' minds. While native speakers' lexical organization is an interesting study in itself, language teachers may naturally be interested in how second language (L2) learners organize their more limited L2 lexicon and how this organization may connect to vocabulary learning and teaching. This study employs the word association task (WAT) format and evaluation points outlined in McCarthy (1990), as well as two additional evaluation points, to examine the word associations made by both L1 Japanese learners of English and L1 English learners of Japanese.

Lexical Relations in the Mental Lexicon

McCarthy (1990) utilizes multiple metaphors when describing the mental lexicon and the tens of thousands of words it contains; as he depicts it, not only is the mental lexicon a vast library of catalogued words and a computer that can process those words in a split second, but it is also a dictionary full of descriptions of word class, pronunciation, and meaning; a thesaurus of related words; and an encyclopedia in which “words carry with them crucial links with...historical, perceptual, and social knowledge” (p. 35). These metaphors only partly capture the complexity of the mental lexicon,

as McCarthy himself notes, but they reveal something significant, namely that there is incredible *organization* underlying the processing, storage, and retrieval of words in the mind. This reality is illustrated by the familiar “tip-of-the-tongue” phenomenon, in which a speaker cannot think of a word and asks her interlocutor for help in retrieving it. She may ask, for instance, “What’s that word that means you really can’t believe something? But it’s an adjective. Like unbelievable, but it starts with ‘im’ or ‘in’...You know, from Princess Bride? I keep thinking of ‘incorrigible,’ but that’s not right...” Her interlocutor, his mind naturally equipped with dictionary-like knowledge of meaning and word class, encyclopedic knowledge of cult classics, and phonological and orthographic knowledge of similarly shaped words, may then quite easily reply, “Inconceivable.”

“Unbelievable” → “inconceivable”, “spring” → “fall”, “sleep” → “deprivation”, and → “hand”, “shy” → “timid”, and thousands of associations like these are readily made in the mental lexicon. Before the implications of these relations can be explored, however, it is necessary to lay the groundwork of how connections between words are classified. Classification schemes of lexical relations in WA vary in specificity, but the influence of three main categories—paradigmatic (also called meaning-based), syntagmatic (position-based), and clang (form-based)—has persisted, with an “other” category typically included also (see Fitzpatrick & Thwaites, 2020, for a summary of WA schemes). Paradigmatic relations are those reflecting similarity, difference, and part-whole relationships between words, typically in the same word class, and can be viewed broadly as relations within taxonomies of words; “spring” → “fall” and “shy” → “timid” above are two examples. Syntagmatic relations are sequential textual relations one might expect to see within a sentence, particularly in a phrase, clause, or collocation, such as “sleep” → “deprivation”. Clang relations are those stemming from phonological or orthographic similarities, such as “and” → “hand”. Relations marked “other” in WA research generally refer to blank responses, responses with no discernible link, or repetitions of cue words.

Categorization WA research utilizing the above classifications has largely sought to elucidate language learners’ lexical storage and retrieval as it compares to that of native speakers. For native English speakers, many studies have shown paradigmatic responses to be most common (Fitzpatrick, 2006; Jiang & Zhang, 2019; Wolter, 2001; Zareva, 2007); others have shown that, depending on the word class (Nissen & Henriksen, 2006) and

frequency (Namei, 2004) of cue words, syntagmatic responses can predominate. McCarthy (1990) hypothesizes that lower level L2 learners, “for a long time lack[ing] the ability to make instantaneous collocational associations...may be more inclined to associate L2 words by sound similarities” (p. 40). However, clang responses were the least common for L1 and L2 participants in the above literature. Even in studies where clang responses were more common in L2 learners’ word associations than in those of native speakers (particularly in instances where cue words were not wellknown to participants), such responses were still the least prominent response type (Jiang & Zhang, 2019; Namei, 2004; Soderman, 1993; Wolter, 2001).

Researching Word Associations in a Japanese/English Context

Bearing the trends in WA research in mind, the present study aims to use WAT data to explore the evaluation points listed in McCarthy (1990, p. 152):

1. At lower levels, do phonological similarities play an important role?
2. Does such a word association test indicate anything about how learners make mental links between words they have learned?
3. Do the results bear out the characteristic types of responses (discussed above)?

As the above studies found clang responses to be the least prominent response type even for L2 learners, an additional research question explored here is 1a) Does the type of test administration (verbal cues/textual cues) impact the prevalence of phonological responses? Furthermore, because data in English is much more abundant than other language data, a fact that may obscure any WAT trends stemming from L1 characteristics rather than L2 knowledge (Fitzpatrick, 2007), both Japanese and English were used in this study, and a final research question (2A) was added: Are learners’ response patterns consistent across their L1 and L2?

The participants in the present study were Japanese, British, and American students, coworkers, and friends of the researcher. The L1 Japanese learners of English ($n = 10$) were aged 15 to 62 years old. The L1 English learners of Japanese ($n = 8$) were aged 23 to 60. The pool of participants was larger initially, but the decision to administer a second set of WATs meant that only those who could take both sets were included in the data for consistency. Proficiency levels in both groups varied significantly, largely in correspondence to years of experi-

ence with the L2. Personal interaction with each participant in their L2 enabled me to divide both the Japanese and the English groups in half, under two broad categories of generally lower and higher ability. These groups are respectively referred to in this study as *inexperienced learners* (L1 English A and L1 Japanese A, with less than four years of L2 study and/or real-life L2 exposure) and *experienced learners* (L1 English B and L1 Japanese B, with 10 or more years of study or exposure).

Creating and Administering the WATs

McCarthy (1990) provides several guidelines for cue word selection. Briefly, selections should include:

- at least one function word
- at least one concrete item
- at least one infrequent word
- a variety of word classes (p. 152).

Although McCarthy recommends using six to eight words for the task, 10 cue words were chosen to test a broader range of words and word classes. Cue words selected for the first English/Japanese set of WATs (EWAT1 and JWAT1) and their characteristics are detailed in Appendix 1A. Because of the presence of some very inexperienced L2 learners, cues selected for the first set of WATs consisted of more basic (and thus quite frequent) vocabulary in each language, but an attempt was made to balance high-frequency words in a class with one of lower frequency when more than one word from that class was used. For example, EWAT1 contains the high-frequency “go” and the comparatively infrequent “sleep”. A second set of WATs with overall much lower frequency cue words was also administered. (The reasoning for this will be discussed later.) The two sets of 10 words² used in the second set of WATs (EWAT2 and JWAT2) are detailed in Appendix 1B.

The cues appeared in a random order in the WATs given to participants (Appendix 2), which were administered in two sessions at least a week apart. Across the two sessions, each participant completed one set of WATs by reading cue words (*textual*) and one set by listening to cue words (*verbal*). The latter is in keeping with McCarthy’s task design, while the former is more typical of WA research, a possible contributing factor to why fewer clang responses are seen in the literature than McCarthy hypothesized. The participants both read and listened to instructions for the task in Japanese or English. The WATs in the appendices being cut into half-sheets to separate the English and Japanese tasks, each

session involved completing a WAT in both languages; the participants were tested in their native language first, followed by their L2. Administration of each WAT was followed by a short interview to clarify responses, but follow-up interviews were not possible in some cases (one L1 English and one L1 Japanese on the first set of WATs and one L1 English and three L1 Japanese on the second set).

Data Entry and Categorization

A total of 720 responses, including one blank response, were recorded from the two sets of WATs. These were categorized according to the scheme detailed in Table 1 below, which includes examples from participants (see Appendix 3 for all responses and categorizations). Though his evaluation points will be used in analyses, McCarthy’s (1990) does not provide a detailed classification scheme for word relations, listing only coordination, collocation, superordination, and synonymy as response types likely to occur in WATs (pp. 39–40). Thus, the schemes used in Fitzpatrick (2006, 2007), which subsume McCarthy’s list, have been preferred, with the addition of *antonym* as a unique sub-category drawing on Carter’s (1998) descriptions of antonymy, as well as my own delineation of *lexical collocations* that represent single units of meaning and *syntactic collocations* that occur within phrases, clauses, etc. Responses resulting from associations with a more uncommon usage of a polysemous word (e.g., “fly” → “pest” rather than “fly” → “airplane”) were categorized according to the association being made. Responses resulting from misunderstanding a homophonous word in verbally administered WATs (e.g., “we” → “Nintendo”) were categorized as *other*, as the association would not have been made if the orthographic form had been visible to participants.

Responses marked with an asterisk in Table 1 exemplify Meara’s (1983) comments that distinguishing between paradigmatic and syntagmatic responses can be “very difficult to work in practice, especially when you cannot refer back to the testee for elucidation” (p. 30). Only post-task discussion confirmed that “English” → “British”, for instance, was a lexical set relationship referring to English (substitute British) people, when it could have been a collocational relationship, that is, British English as opposed to American English. The reverse is true for “theater” → “movie”, in which both words are of the same class, but the consecutive yx collocation forming “movie theater” was prominent. Even though interviews helped in these instances, it should be noted that participants often could not explain exactly why spontaneous responses were associated with cue words in their minds. Further-

Table 1

Classification Scheme for Categorizing WAT Responses

Main Category	Sub-category	Participant Examples
paradigmatic (meaning-based)	synonym (defining or context-specific)	“shy” → “timid”; “and” → “plus”
	antonym (gradable, complementary, converse)	“cold” → “hot”; “sleep” → “awake”; “listen” → “speak”
	lexical set (meronym, (co-)hyponym, superordinate)	“desk” → “office”; * “English” → “British”; “come” → “return”
syntagmatic (position-based)	conceptual link (strong conceptual, loose conceptual, encyclopedic)	“summer” → “beach”; “cold” → “blue”; “mirror” → “makeup”
	lexical collocation (consecutive xy/yx lexical item, compound)	“spider” → “man”; * “theater” → “movie”; “go” → “home”
	syntactic collocation (naturally co-occurring within phrase, clause, etc.)	“English” → “fun”; “always” → “school”; “wash” → “laundry”; * “fly” → “sky”
clang (form-based)	other collocation (title, idiom, lyric)	“cloudy” → “meatballs”
	change of affix (conjugate, plural)	“go” → “gone”; “come” → “coming”
	similar form (orthographic, phonological)	“we” → “week”; “at” → “it”
other (erratic)	blank, repetition, no discernable link, mistake (homonym, misreading)	“go” → “relief”; “theater” → “girl”

more, for an association like “fly” → “sky”, participants would supply explanations such as “You know, ‘fly in the sky,’” feeling like the association is natural and obvious. Unfortunately, categorization based on such a response is not so straightforward, as an argument could be made for a connection based on meaning, position, or form. Such categorization difficulties are noted in WA research (Fitzpatrick, 2006; Nissen & Henriksen, 2006), and there would certainly be points of disagreement between how I and other WA researchers have delineated WA relations.

Evaluation of the Results

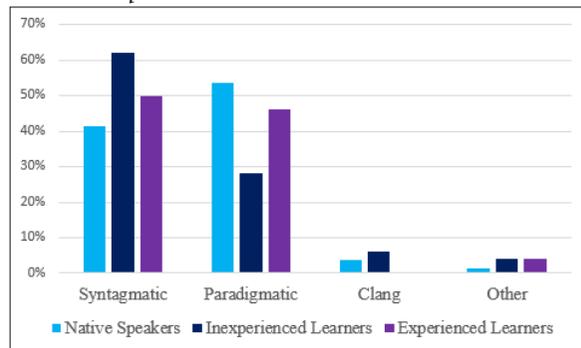
Categorization issues notwithstanding, the fact that all responses were categorized in the same way here provides the internal consistency necessary for applying the evaluation points introduced above. This consistency also means that despite the small pool of participants, comparisons between groups may reveal trends worth further exploration. To briefly rephrase, the questions to be examined are: 1) whether inexperienced learners produce more clang responses and 1a) if verbal versus textual administra-

tion of cue words affects this; 2) what the tasks reveal about learners’ mental links and 2a) whether these links are consistent across tasks/languages; and 3) whether responses align with expected relations.

Inexperienced Learners’ Responses

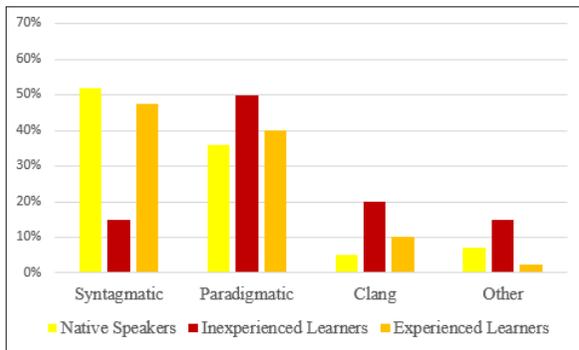
The response patterns for the first set of WATs are detailed in Figures 1 and 2 below.

Figure 1
EWAT1 Response Patterns



The incidence of clang responses was minimal for inexperienced L1 Japanese learners of English ($n = 5$) on EWAT1. Only three out of 50 responses (6%) were clang responses. However, no clang responses were provided by experienced learners. Of clang responses, two were provided by participants taking a textual WAT and one by a participant taking a verbal WAT, indicating that oral delivery did not elicit more clang responses.

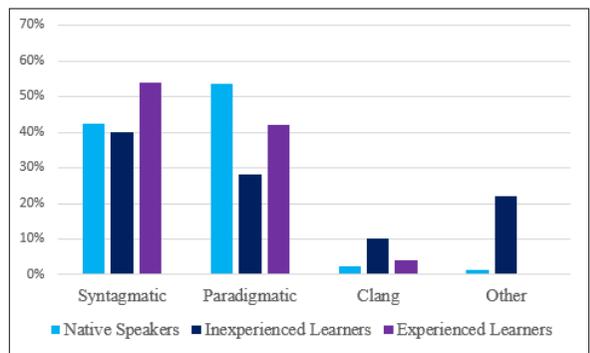
Figure 2
JWAT1 Response Patterns



Clang responses were more prevalent in inexperienced L1 English speakers' ($n = 4$) JWAT1 results, comprising 8 out of 40 total responses (20%). As with the L1 Japanese group, however, participants' clang responses were unaffected by verbal versus textual test administration. Of their clang responses, half were a change of affix, such as "kuru" → "kimasu (come)" → "(will) come". This is worth noting because Japanese verbs are highly inflected, and conjugation plays a significant role in Japanese. In many instances in which verbs are modalized in English—"go" becomes "can go, won't go, let's go"—they are inflected in Japanese—respectively, "iku" becomes "ikeru", "ikanai", and "ikou". Thus, lower-level learners of Japanese may rely on learned grammar rather than just form in their clang responses, slightly contrary to what McCarthy suggests.

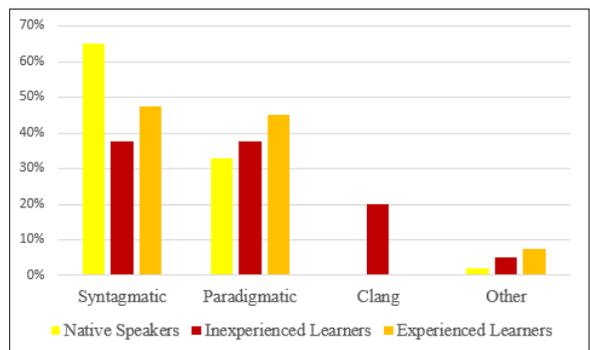
For this reason, and because the results of EWAT1 including only one blank response and few clang responses in the L1 Japanese group, a second set of WATs containing overall lower frequency words, more likely to be unfamiliar or unknown to learners, was administered in order to better evaluate whether inexperienced learners rely more on form similarities. Figures 3 and 4 below summarize the results.

Figure 3
EWAT2 Response Patterns



A paired-samples t-test analysis of EWAT2 showed a nonsignificant increase in clang responses among the inexperienced learner group, rising from 6% to 10% ($p = .59$). What did increase significantly was the percentage of "other" responses, from 4% to 22% ($p = .02$). Although these results should be viewed with caution because of the very small sample size, it is interesting that students, who were encouraged to respond even if they did not know a word, often fell back on basic English they had learned (e.g., "theater" → "study", "that" → "yay!", "soon" → "apple") instead of responding to unknown words based on form similarities.

Figure 4
JWAT2 Response Patterns



For L1 English participants' results on JWAT2, inexperienced learners' frequency of clang responses, which included three changes of affix, did not increase; experienced learners gave no clang responses.

Learners' Mental Links

While inexperienced learners of Japanese and English gave more clang associations than experienced learners, it is clear from the figures above that responses for all groups fell mainly in the syntagmatic and paradigmatic response categories. Within these main response types, however, further analysis revealed interesting differences worth exploration. Separating lower and higher L2 groups in their L1 as well and consolidating results of both English WATs and both Japanese WATs for a representative dataset for all participants yielded the results in Figures 5 and 6 below. L1 English A and L1 Japanese A represent the less experienced L2 learners and overall younger groups, whereas L1 English B and L1 Japanese B represent the more experienced L2 learners and overall older groups.

Figure 5
English Response Patterns Across Four Groups

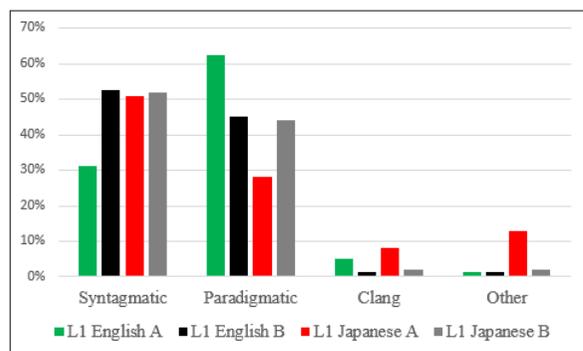
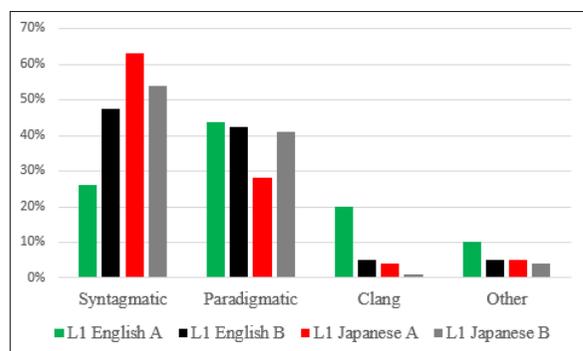


Figure 6
Japanese Response Patterns Across Four Groups



In their first and second language results, the less experienced participants are almost mirror images of one another. L1 English A's responses to the English tasks were predominantly paradigmatic (62.5%), with syntagmatic responses coming second (31.25%). Increased clang and "other" responses not-

withstanding, this preference remained in their L2, with 43.75% of responses paradigmatic and 26.25% of responses syntagmatic. Conversely, L1 Japanese A's responses in Japanese were 63% syntagmatic and only 28% paradigmatic, and in their English responses these percentages were 51% and 28%, respectively. Thus, the results here indicate that inexperienced learners are making mental links in their L2 similarly to how they connect words in their L1: English speakers primarily based on meaning-related groups, and Japanese speakers primarily based on connections within strings of language.

In the response patterns of L1 English B ($n = 4$) and L1 Japanese B ($n = 5$), the experienced L2 learners and overall older groups, learners' paradigmatic/syntagmatic response preferences were less marked. Interestingly, though, both groups' preferences trended the same way across languages—toward syntagmatic responses, thus prompting the question of whether the L1 English B group, three of whom have lived in Japan for at least a decade with Japanese spouses, have been influenced by their L2 surroundings enough to alter their L1 word association behavior or whether the same preferences would have been present regardless, as happens with some native speakers (Fitzpatrick, 2007). Unfortunately, exploring this hypothesis is difficult because of the limited sample size, but comparisons with L1 English A point to the possibility that extended exposure to Japanese has altered advanced learners' mental links in both their L1 and their L2. L1 Japanese B also hints at the possibility of L2 influences, as their response preferences were less distinct than L1 Japanese A.

Specific Relations: Emergent Patterns

Though participant responses fell mainly in the categories of paradigmatic and syntagmatic relations, the above data do not give a detailed picture of the types of meaning-based and position-based connections participants made. Categorizing results further should reveal whether participants responded with the types of relations McCarthy's final evaluation point predicts. Applying the categorization scheme detailed earlier, all groups' paradigmatic responses in both languages yielded the results in Figures 7 and 8 below.

For the L1 English A group, lexical set relations—McCarthy's coordination (co-hyponyms) and superordination, as well as meronyms and hyponyms—were the most common in English and Japanese, followed by relations of antonymy. In English, lexical set relations were also the most common paradigmatic relations for L1 English B and L1

Japanese A groups, but second to these relations were conceptual links; for L1 Japanese B, conceptual links were slightly more prevalent than lexical set relations. This tendency toward conceptual associations was more pronounced in the Japanese tasks, accounting for the majority of L1 English B, L1 Japanese A, and L1 Japanese B's paradigmatic responses in Japanese, followed by lexical set relations. Just a few examples of conceptual associations made in Japanese include "but" → "negative, mirror" → "face, rabbit" → "carrot, and this (n.)" → "goods/merchandise". Thus, in addition to a tendency toward syntagmatic responses that is uncommon in WA research, these three groups' paradigmatic results in Japanese also deviate somewhat from the relations that McCarthy would expect.

Figure 7
Paradigmatic Relations in EWATs

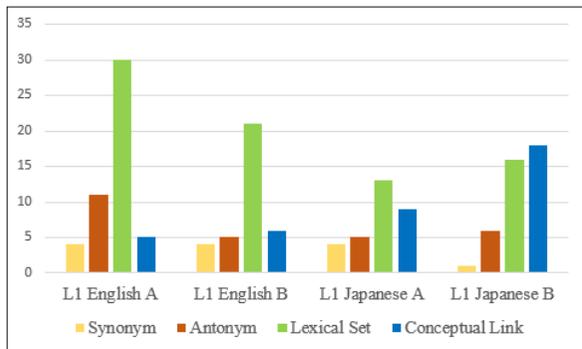
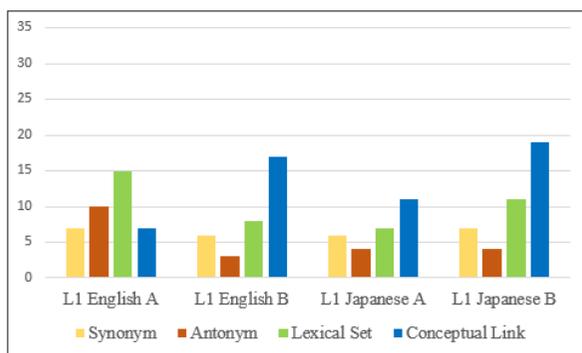


Figure 8
Paradigmatic Relations in JWATs



As for learners' syntagmatic responses, McCarthy (1990) simply provides collocation as a type of common response, but his examples of "butterfly" → "net", "bright" → "red", and "salt" → "water" (pg. 40) are more typical of lexical collocations according to the scheme used here, as opposed to syntactic collocations. As is evident in Figures 9 and 10, however,

syntactic collocations were more common for all groups in both languages.

Figure 9
Syntagmatic Relations in EWATs

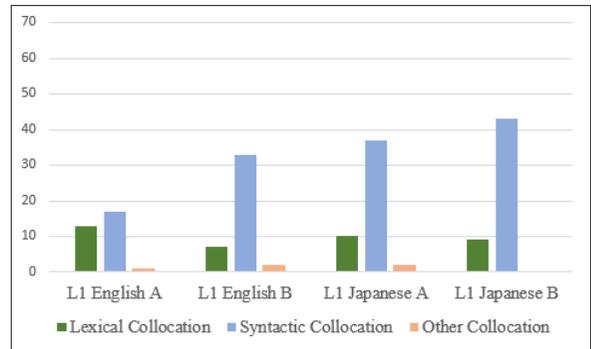
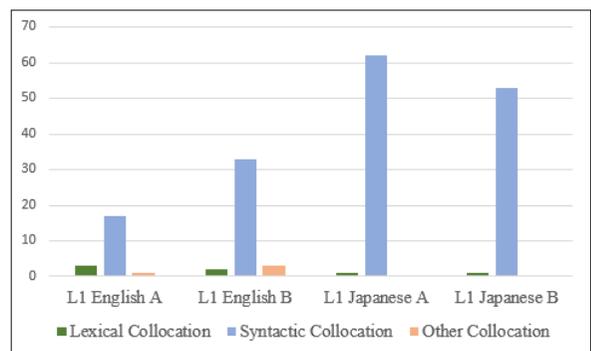


Figure 10
Syntagmatic Relations in JWATs



Examples from EWATs include "go" → "Hawaii, interesting" → "story, and" → "you, sleep" → "can't, and at" → "11:00. Examples from JWATs include "come" → "friend/s, beautiful" → "heart, language" → "speak, always" → "happy, and this" → "desk". Had the cue words contained more nouns, syntactic collocations would likely have been less prevalent (Li & Wang, 2016; Nissen & Henriksen, 2006), but it may be worth considering what effects language or cue word variety have on participants' lexical versus syntactic responses. It is clear, for instance, that Japanese elicited a large number of syntactic responses, especially for the younger Japanese group (62% of their total responses in Japanese were syntactic collocations).

Implications for EFL in Japan

To summarize, the results of the WATs indicate the following: 1) slightly increased clang responses

at lower levels, but ‘other’ responses to unknown words prominent for L1 Japanese participants; 1a) a nonsignificant impact of verbal versus textual test administration on clang responses; 2) a tendency toward paradigmatic responses for inexperienced learners of Japanese, toward syntagmatic responses for inexperienced learners of English, and less marked preferences in the experienced groups; 2a) overall consistent response patterns across speakers’ L1 and L2; 3) responses aligning with expected relations for younger L1 English speakers and diverging for younger L1 Japanese speakers.

These results could have implications for EFL in a Japanese context, perhaps the most significant of which relates to Japanese students’ tendency toward syntagmatic responses, in direct contrast to their young L1 English counterparts. Although it is possible that the nature of each language affects response patterns, as is suggested by shifts in preference in experienced learners, another possibility lies in how English and Japanese are taught to native speakers. Vocabulary learning in the U.S. consists of learning lists of words and their many (paradigmatic) parts—definitions, word class, synonyms, and antonyms—and how they are used. According to native Japanese coworkers interviewed after all the data were compiled, Japanese vocabulary is mainly learned through various readings, throughout which unknown words are looked up in a Japanese dictionary consisting only of definitions and example sentences/phrases with blanks into which the words would fit in usage. Both types of learning seem to correspond with the younger L1 English and L1 Japanese groups’ response patterns, indicating the possibility that the shift away from such distinct preferences in experienced L2 learner groups could actually be a reflection of their distance from days in the classroom.

This raises the question of what method might help Japanese students learn English vocabulary most effectively. Should English vocabulary be taught the “English way”, “Japanese way”, or by some other method? While not representative, anecdotal evidence suggests that teachers in Japan often teach vocabulary using L2 word lists with L1 translations. Given the way Japanese students are accustomed to learning vocabulary in their native language, however, coupled with the importance of learning useful language “chunks”, or lexical phrases (see Nattinger & DeCarrico (1992) for an in-depth examination), it may be worthwhile for English teachers in Japan to consider teaching English vocabulary within phrases, clauses, and sentences—in other words, syntagmatically. This suggestion can only be made cautiously in light of the factors

limiting this study, namely, response categorization being completed by only myself (potentially skewing results) and small participant samples (making any claims of significant group differences subject to criticism). However, further investigations into the impact of years away from school and/or time spent living in an L2 environment on older participants’ WA behavior, the impact of L1 vocabulary learning methods on L2 WA behavior, and the learning gains for Japanese students, if any, of learning English vocabulary syntagmatically, would be welcome in light of the results presented here.

Conclusion

This study has used McCarthy’s evaluation points to examine the WA behavior of both inexperienced and experienced L1 English learners of Japanese and L1 Japanese learners of English. First, words from a variety of word classes and with varying frequencies were selected for word association tasks in both English and Japanese. These WATs were then administered to the participants, and the responses were categorized by association type and analyzed across languages. The limitations of a small pool of participants notwithstanding, the results indicated that clang responses were not as prevalent for even inexperienced learners as other types of relations. For the younger L1 English group, paradigmatic relations, particularly of lexical sets and antonymy, were most prominent across their L1 and L2. For the other three groups and especially the younger L1 Japanese group, syntagmatic responses, particularly syntactic collocations, were most prominent. These tendencies point to a possible influence of L1 vocabulary teaching and learning on learners’ L2 lexical associations, inviting exploration into how such an influence, if present, might be used to learners’ advantage.

Notes

1. To differentiate, word associations translated from Japanese will be italicized and English associations will not.
2. In fact, four translation equivalents from the first WATs were included in both Japanese and English in the second sets to test whether participants were mentally translating responses, bringing the total to 14 words each, but the cue word and participant sample sizes were too small to adequately explore this possibility, so translation equivalent cue words were discarded in analysis.

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Appendices

The appendices can be found in the online version of this article at <https://jalt-publications.org/tlt/archive>.



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