

Word Association

What can It Tell Us about Vocabulary Acquisition?

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Introduction

Vocabulary is central to communicating in a foreign language. Without sufficient words to express a wide variety of meanings, communicating in a foreign language cannot happen in a meaningful way (McCarthy, 1990). As such, vocabulary acquisition is a primary concern for Japanese foreign language learners, and it is a main focus of their interest and attention.

A casual survey of what Japanese university students find most difficult about sustaining even short conversations in English often elicits responses such as “I can't express my ideas” and “I don't have the words”, or self admonishments such as “I was stuck for a word many times” or “I should know more English words”. In spite of having acquired a large English lexis for high school examination purposes, when students are “off the page” and speaking extemporaneously, even about familiar everyday topics, they experience firsthand the limitations of their productive vocabulary. Engaged by a class activity yet restricted by insufficient vocabulary, a common expedient is to revert to speaking in Japanese.

How is language organized and what are the mechanisms that allow us to retrieve the words we know immediately and correctly? Psycholinguistic studies have shown that words are not stored in the mental lexicon as single independent items but form clusters or webs with other related concepts so that words acquire their full meaning in reference to related terms (Aitchison, 1994). In addition, context illustrates the scope and depth of a word's meaning as well as its relationship to other lexical items, thus learning words in context and in association with their common connected notions enables learners to recall them more readily. If we take into account the common ways in which words associate with one another when we present and teach vocabulary, and prepare lessons that support the natural way the mind acquires and catalogues lexis, both teaching and learning will become more potent.

In this paper I will report results from a word association study investigating how the mental

lexicon of English L2 learners is organized, and if it is similar or different from that of native speakers. The questions posed for this study are:

- Do L2 speakers organize words according to word class as do native speakers?
- Does phonology play a role in L2 lexical associations?
- Do L2 speakers organize the mental lexicon according to collocation?
- How much does world knowledge influence L2 lexical associations?

This paper will first discuss mother tongue word association surveys and what such surveys show to be the predominant patterns of L1 lexical organization. I will then report on a word association study conducted with students from Kansai University and analyze the ways in which L2 lexical cataloguing mimic or diverge from that of L1 cataloguing.

How native speakers organize lexis

Generally speaking, L1 speakers have a web of words that crosslink in terms of phonology, syntax and semantic references (Aitchison, 1994; McCarthy, 1990; Channell, 1988; Carter, 1987; Deignan et al., 1996). Word association tests have shown consistencies in the ways in which people catalog and bundle words and a uniformity in response patterns even though people may respond with different words (McCarthy, 1990). Results from word association tests, and from studies conducted using participants with speech disorders, indicate that the most commonly occurring associations involve semantic sets, and of these the most predominant are: coordination, collocation, super-ordination, and synonymy. A coordinate word is represented by response words belonging to the same semantic field as the stimuli and with the same level of detail such as *red* and *blue* or opposites such as *light* and *dark*. Coordination is the most common type of response given by L1 speakers on word association tests. The second most common response type is collocation, in which the stimulus word elicits words commonly associated with it, for example, *honey* and *bee*. Such co-occurrences are not random and can be either lexical or grammatical. Synonyms correlate words that have similar meaning such as *angry* and *mad*, and super-ordinates are responses which subsume the meaning of the stimulus word such as *pet* for the prompt *cat* or *hamster* (Aitchison, 1994).

Even when L1 speakers make mistakes in lexical choice there is usually consistency in these areas. Semantic errors generally conform according to word-class type so that nouns elicit nouns, adjectives other adjectives. Sound production errors caused either by blending the sounds of words which are closely linked in meaning or by malapropism (represented by slips of the tongue or tip-of-the-tongue forgetfulness) indicate the importance of phonology in the

storage and retrieval of lexis. In such errors, although the word choice is wrong, there is a phonological similarity to the correct word either in the number of syllables that constitute both words, or by a similarity of beginning and ending sounds of each word, or in a similarity in the rhythmic structure and stress patterns. (Aitchison, 1994; McCarthy, 1990; Channell, 1988; Cieslicka-Ratajczak, 1994).

In addition to lexical linkages, every individual also associates words according to personal experience, known as encyclopedic responses, which follow a logical train of thought known only to the speaker (McCarthy, 1990). In such cases, the word *ship* might elicit a response such as *camping*; an otherwise clear or obvious relationship between words is not apparent without investigating the speaker's intention.

Similarities and differences

How does the mental lexicon and lexical organization of L2 speakers correspond to that of L1 speakers?

One view is that L2 speakers code lexicon phonologically with words forming clusters with those sharing similar sounds (Meara, 1983 quoted in Cieslicka-Ratajczak, 1986). Such judgments are based on finding a predominance of “clang” associations (words phonologically similar to the test word) in L2 word association responses, a phenomenon not found with L1 speakers. Other researchers hold the view that words are classified according to semantic categories because of the frequent occurrence of semantically motivated errors (Channell, 1988; Carter, 1987; Singleton & Little, 1991 quoted in Cieslicka-Ratajczak, 1994). But Channell also reports notable differences in the lexical associations that native and non-native speakers make. In particular, that L2 responses lack the consistency of response type that is common among L1 speakers. Deignan et al. (1996) report that in word association tests, collocational relationships are more typical for L2 speakers than for native speakers, who more often use coordinate associations.

Kansai University study

To examine these theories and consider the patterns of lexical organization in my own learners, a short word association survey was given to 45 Japanese university freshmen. The students belong to the Faculty of Law and Letters. In general, the students are at an intermediate English proficiency level with a small number of students within the group exhibiting either lower or higher levels of ability.

Due to schedule and time constraints, the survey was administered at the start of the final

class of the first semester and the material was given cold, meaning there was no warm-up activity before the association task began. It was unfortunate not to have had time for a warm-up, as such activities seem to help students make the transition from their Japanese-speaking world to an English-speaking one and might have helped them access a larger part of their lexical resource.

Students were asked to listen to 6 words and write down the first word that came to mind after hearing each one. The test items were chosen according to suggested specifications (McCarthy, 1990): a grammar/function word; words common to the everyday known physical environment; a low frequency word that students would probably know, and mixture of word class.

The words were: *library*, *bottle*, *single*, *intelligent*, *below*, and *suppose*.

Not all of the students were able to find an association for every word, and some words were left blank. In addition, some responses appeared to represent personal associative relationship or “encyclopedic” association. For example the word *intelligent* drew the responses *gentleman*, *industry*, *eligible* and *future*. In this instance and in other cases, I have treated such words as miscellaneous items and have not listed them individually in the response outcome analysis. (see Appendix 1).

Study analysis

Results from the word association test indicate varied systems of organization. In regard to word class, where response words have a similar function or are in the same grammatical group, there are examples across all categories. The results are similar to those of native speakers where nouns retain their word class strongly 80-90% and verbs and adjectives to a somewhat lesser extent 50-60% (Aitchison, 1994). In the present study, word class is maintained in all categories, but most notably within the noun group. Responses to the word *library* maintained the same word class 88% of the time, and *bottle* 81%, well within the margins seen with native speakers. Word class responses followed similar native speaker percentages in other groups as well. Adjectives maintained word class 50% of the time for both *single* and *intelligent*, and the word *below* was responded to with a preposition in twenty-one out of forty-two cases. The verb *suppose* elicited other verbs in 66% of the responses.

Even while maintaining word class, one cannot overlook the prominence of collocational relationships existing between the stimulus words and responses, particularly in the noun category. *Book* was associated with *library* in thirty-eight of the forty-six responses. In response to the item *bottle* there was a large variation in answers, which is consistent with evidence

reported in Carter (1987) and Channell (1988), but thirty-one students out of thirty-eight responded with words which frequently collocate such as *water*, *whiskey*, *beer*, *milk*, and *glass*.

In other categories, results indicated organization via commonly associated words but did not demonstrate as strong systematization by collocation as in the noun category. Only fourteen out of forty responses to the word *single* and nine responses out of forty to the word *below* were words frequently appearing with these items. Whether this demonstrates an experience of regularly encountering such words frequently together, such as *single bed*, *single room*, *music single*, *the valley below*, *below the surface*, as I suspect it does, or whether there is some syntagmatic awareness developing (Aitchison 1994, Gairns & Redman, 1986) is difficult to surmise.

It appears that in addition to collocational systemization, learners' lexical organizations incorporate semantic relationships as well. Interestingly, *single* elicited the response *double* a total of 16 times and *married* twice. These responses correspond more closely to those of native speakers, who tend to pick partners of pair items, particularly if there is an obvious opposite (Aitchison, 1994; Gairns & Redman, 1986).

Responses to *intelligent* and *suppose* demonstrate both semantic and paradigmatic relationships. Many students associated words with similar meanings or, occasionally, words of opposite meaning, though examples of the latter are minimal. Twelve students out of thirty-three responded to *suppose* with *think*, while *wise*, *smart*, *clever* and *bright* were associated with *intelligent* by twelve out of forty respondents; two students responded with the word *fool*. It appears that L2 lexical items are organized along semantic lines, as is L1, where items closely related in meaning seem to be stored together (Aitchison, 1994; McCarthy, 1990; Channell, 1988).

Other associations, for example *scholar*, *genius*, *professor*, *computer*, *doctor* and *knowledge*, which were suggested in response to *intelligent*, do not fall into any of the specific semantic categories, as they are neither synonyms, hyponyms, nor antonyms of the stimulus word. Neither do any of these responses have any obvious strong collocational ties to *intelligent*. Gairns and Redman (1986) make reference to other types of relationships between items, relationships which have to do with cause and effect and which give clues about unfamiliar items from context and from experience of the world. McCarthy (1990) also notes that native speakers associate world knowledge and experience with words. It would seem likely that language learners make similar associations, and this factor could explain some of the miscellaneous associations in each group. For the word *intelligent*, items included *me*, *people*,

industry and *gentleman*; *below* curiously elicited *Japanese* along with *hell*, *dark* and *black*, which may have some socio-cultural associations. *Single* caused one student to answer with *father*, others responded with *me* and *lonely*. It could be surmised that these kinds of responses have a personal connection to learners' experiences. The lexical items and events have linked and created a broader range of association.

Research also indicates that phonological associations are important for both L1 and L2 speakers when storing and ordering lexical units, especially for lower-level L2 speakers. Aitchison (1994) and Channell (1988) cite tests in which native speakers demonstrated awareness of the phonology and structure of words with regard to tip-of-the-tongue situations; in particular errors are similar to the correct word in stress patterns, number of syllables and first and final sounds of the target word (bathtub effect). Channell (1988) also refers to research by Meara which indicates that some errors committed by L2 learners have similar phonological ties to the target word such as clang associations, which have corresponding sounds to the stimulus. This phenomenon is common with children using L1. Such findings suggest that the general shape of a lexical item is important for both L1 and L2.

Although there is no clear evidence of clang associations in student responses in the present study, I am inclined to consider this as a possible factor contributing to certain responses to the item *suppose*. The response *propose* may be an example of a clang association for *suppose*. As well, the responses *plan* and *future* may have resulted from learners confusing the stimulus item for *propose*. Some response items have no clear relationship to the stimulus word, but might have resulted from learners mistaking it for other words. Responses such as *refuse* and *against* could possibly indicate confusion with *oppose* as the stimulus; other examples such as *parents*, *family*, *help* might be as a result of misinterpreting *support* for *suppose*. The assumed misunderstandings resemble the test item in number of syllables, stress pattern, and ending, much like that found to be true of L1 speakers.

Although no definitive conclusions can be drawn from this survey, it appears that L2 learners organize the mental lexicon much like L1 speakers do, although the preference for or dominance of certain systems may differ between these two groups. L2 learner responses demonstrated a use of varied systems, semantic and paradigmatic, with strong indications that word class is an important feature of lexical organization. Responses demonstrated organization by means of collocation, synonym, antonym, and coordinates; there was no apparent structuring according to super-ordinate or hyponym, although this may have been due to the stimulus words. Personal experiences also appear to play a role in lexical linkage. Although phonological systematizing can only be surmised, there are indications that similar sounding words could

possibly be stored close together as seems to be the case with L1 speakers.

Relevance to teaching

Several salient points in this survey become relevant for teaching: the mental lexicon is contextualized and words are stored interdependently with other connected ideas. Collocation seems to predominate in the L2 lexicon and personal experience is an important route through which vocabulary is assimilated. If we as teachers exploit these natural ways that learners catalogue and assimilate language when we present and review vocabulary items, it may help students not only acquire new words but also enrich the knowledge and recall of previously learned words.

Familiar activities used in presenting new vocabulary items such as matching words to their definitions or synonyms and presenting common collocations or phrases help to develop an awareness of how words relate to one another. But meaning alone is not sufficient to fully incorporate new words into the mental lexicon. Learners will have a better chance of absorbing and recalling new words if they can relate them to some context and then use the new items in meaningful communicative tasks.

Our classroom instruction should therefore include activities that help students make meaningful connections between new and formerly learned vocabulary. Free association, brainstorming or mind mapping of words and topics can help to highlight the interdependent relationship between words and, as a precursor to an activity, encourage learners to recall, enlarge, and raise awareness about words they know. Such preparation enables them to draw on prior knowledge and personal experiences with the potential of producing a richer and more personal discourse in the later stages of an activity.

While there are no absolute conclusions as to how the L2 mental lexicon is organized, what is known can guide teachers in developing activities and tasks that help learners make connections with the broader lexicon. The results would be an increasingly dynamic lexical network, and consequently, more efficient vocabulary use.

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Appendix 1

Library (Noun)	Bottle (Noun)
book (s) (37)	water (11)
study (3)	whiskey (6)
newspaper (1)	beer (6)
student (1)	drink (4)
sit down (1)	glass (3)
big (1)	wine (3)
quiet (1)	milk (2)
	cup (2)
Total (45)	Total (38)

Single (Adj)	Intelligent (Adj)
double (16)	wise (5)
bed (5)	smart (3)
tennis (3)	clever (3)
CD (3)	teacher (3)
	doctor (2)
lonely (3)	college student (2)
married (2)	genius (1)
room (1)	scholar (1)
hit (1)	professor (1)
wedding (1)	bright (1)
music (1)	fool (1)
one (1)	knowledge (1)
me (1)	computer (1)
father (1)	rich (1)
finger (1)	considerate (1)
	nice (1)
	(misc) (9)
Total (40)	Total (38)

Below (Prep)	Suppose (V)
above (8)	think (12)
under (5)	imagine (1)
over (4)	opinion (1)
behind (2)	believe (1)
beyond (1)	idea (1)
ground (2)	mind (1)
leg (2)	answer (1)
dark (2)	against (2)
valley (1)	future (2)
sea (1)	family (2)
river (1)	help (2)
bridge (1)	refuse (1)
tree (1)	parents (1)
floor (1)	propose (1)
horizon (1)	plan (1)
hell (1)	(misc) (3)
desk (1)	
(misc) (5)	
Total (40)	Total (33)