**Word Associations in a Foreign Language**
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Research into lexicography is a relatively well-developed field of applied linguistics, as some of the papers in this volume of NLC will testify. Almost all this work deals with linguistic aspects of lexicography, however, and very little of it is concerned with a related, equally interesting, but much more elusive question: what does a learner's mental lexicon look like, and how is it different from the mental lexicon of a monolingual native speaker? As a part of a preliminary skirmish into this area, my students and I have been using word association tests. So far we have produced a small number of interesting, but unsurprising findings, and a large number of methodological puzzles and problems. The main findings have already been published elsewhere, and so in this paper I shall discuss them very briefly before dealing at greater length with the problems and their implications for further research.

The basic word association game is extremely simple. It requires two players: one whose task is to call out or show single words, and a second whose task is to respond to these words with the first word that comes into his or her head. Despite its popular image as a sure-fire way of probing people's innermost secrets, the most striking thing about associations is that they are actually extremely boring and predictable. Given a word like MAN, 60 or 70 per cent of normal adult native speakers of English will reply with **woman**. BLACK produces **white** and HARD produces **soft** about the same proportion of times. Even relatively unpredictable stimulus words like MEMORY or MUSIC still produce a very limited range of responses. With a hundred people, you would be likely to get about 25 to 30 different responses, but most of these will occur more than twice, and only a relatively small number will be unique responses. Using bigger groups of subjects does not make very much difference to this pattern; responses tend to stabilize with groups of fifty or more, and using a group very much larger than this makes little difference to the range or pattern of responses.

It is customary to claim that word association responses generally fall into two main classes called **syntagmatic** associations and **paradigmatic** associations. These terms have much the same meaning as they do in Saussure. Syntagmatic associations are responses which form an obvious sequential link with the stimulus word. Given DOG, for example, *bark, spotted, naughty,* or *bite* would generally be classified as syntagmatic responses. Responses which are from the same grammatical form class as the stimulus word are classed as paradigmatic. Thus, given DOG, *cat, wolf* or *animal* would all be classified as paradigmatic responses. Personally, I have found that this distinction is very difficult to work in practice, especially when you cannot refer back to the testee for elucidation, but this difficulty is not generally commented on in the literature. The distinction is important because it is generally held that most normal native speaking adults have a tendency to produce paradigmatic responses in preference to syntagmatic ones. Children, on the other hand, tend to prefer syntagmatic responses, at least until they reach the age of seven or so. Children also tend to produce large numbers of **clang**

associates - i.e. responses which are clearly related to certain phonological features of the stimulus word, but bear no obvious semantic relationship to it. Rhyming responses, assonance, responses with the same initial sounds as the stimulus, or a similar prominent consonant cluster are common types of clang associate.

The word associations produced by non-native speakers differ fairly systematically from those produced by native speakers. Surprisingly, learners' responses tend to be more varied and less homogeneous than the responses of a comparable group of native speakers. This is an odd finding because learners must have a smaller, more limited vocabulary than native speakers, and this might lead one to expect a more limited range of possible responses. Learner responses are not generally restricted to a subset of the more common responses made by native speakers, however. On the contrary, learners consistently produce responses which never appear among those made by native speakers, and in extreme cases, it is possible to find instances of stimulus words for which the list of native speaker and learner responses share practically no words in common. The reasons for this are not wholly clear, but one contributory factor is the fact that learners have a tendency to produce clang associations like young children. A second contributory factor is that learners very frequently misunderstand a stimulus word, mistaking it for a word that has a vague phonological resemblance to the stimulus. This clearly leads to maverick responses, but these cannot be dismissed out of hand. The frequency of the phenomenon suggests that actually identifying foreign language words reliably is a major problem for many learners, and this seems to be the case even when the words are simple, and when the learners themselves claim to know them.

Some examples of learner responses of this type are shown in Table one, along with a set of plausible interpretations.

**Table 1: Associations to French Stimulus words which seem to be based on misinterpretations of some sort.**

| STIMULUS | RESPONSE | SOURCE OF CONFUSION? |
|---|---|---|
| béton | animal | bête |
| béton | stupide | bête |
| béton | conducteur | bâton |
| béton | orchestre | bâton |
| béton | téléphoner | jeton |
| béton | Normandie | breton |
| fendre | permettre | défendre? |
| naguère | eau | nager |
| caque | poulet | cackle (?) |
| caque | rigoler | cackle |
| caque | gateaux | cake |
| semelle | dessert | semolina (?) |
| semelle | odeur | smell |
| traire | essayer | try |
| cruche | important | crucial |
| émail | lettre | mail |

**Table 1** *continued*

| | | |
|---|---|---|
| émail | chevalier | mail |
| dru | dessiner | drew |
| toupie | argent | 2p (?) |
| toupie | cheveux | toupé |
| risible | lavable | rinsable (?) |
| risible | incre | rinsable (?) |
| jeter | hurler | hurl |
| mou | vache | moo |
| etc... | | |

This sort of data, taken together with the fact that learner responses tend to be relatively inhomogeneous anyway, suggests that the semantic links between words in the learner's mental lexicon are fairly tenuous ones, easily overridden by phonological similarities, in a way that is very uncharacteristic of native speakers.

So much, then, for the basic findings. What about further research based on these foundations? The word association test is so simple to use, and produces such a wealth of data with a minimum of effort, that one would expect to find a large amount of research using this paradigm. Surprisingly, this is not the case. A number of studies do exist, (see Meara 1981 for a survey of this work ), but they all seem to cover much the same ground, producing little in the way of new findings, and rarely even trying to break new ground. There are no theoretical models which account satisfactorily for word association behaviour in a second language, and consequently almost all the work published so far (including my own study (Meara 1978), alas) has been content merely to describe the sorts of responses that learners produce, together with a minimal statistical analysis. It seems to me that one of the prime reasons for this lack of development is that far too little consideration has been given to what words should be used as stimuli. Some of the published work makes use of idiosyncratic lists from which it is difficult to make generalizations. An extreme case of this is Ruke-Dravina (1971) who used only four stimulus words in her study of Finnish-Swedish bilinguals. Generally, where idiosyncratic lists of stimuli are used there is no discussion of why these words were chosen, or why they might be considered especially worthy of note. This is unfortunate because it means that discrepant results can always "explained away" in terms of the stimuli used, and there is no incentive to incorporate these discrepancies into a coherent overall framework. The alternative to idiosyncratic lists is to use one of the many standard lists of stimuli - generally the Kent-Rosanoff list. This list of words was first used by Kent and Rosanoff in 1910 as the basis for a study of the word associations made by mentally ill subjects. Since then, it has been widely used in word association research, both in English and - in translation - in a range of other major languages. The list consists of 100 relatively frequent words, all of which produce fairly stable response patterns in normal native-speaker adults. the extensive use of this list means that a very large number of sets of association **norms** are available: i.e. collections of responses based on large groups of similar subjects, (cf. for example, Postman and Keppel (1970) ). In theory, this ought to make it possible to do useful and illuminating comparisons between the responses of learners and native speakers, and, indeed, a number of studies have attempted to do this.

Unfortunately, the Kent-Rosanoff list is not a particularly useful one for research on second language learners. The most important reason for this is that the high frequency words used tend to produce very similar responses in both the TL and the NL. Adjectives, for instance, tend to produce their polar opposites, so one finds BLACK ~ **white**; NOIR ~ **blanc**; MOU ~ **dur**; SOFT ~ **hard**. This makes it difficult to decide direct response, or whether it is produced via translation into the mother tongue and back again. The same argument applies in the case of nouns which are marked for sex: these tend to produce the opposite sex form as a response; so, KING ~ **queen**; ROI ~ **reine**; and BOY ~ **girl**; GARÇON ~ **fille**. As far as English and French are concerned, about 60% of the items in the Kent-Rosanoff list are of this sort. I do not know the figures for any other pair of languages, but it seems probable that most European languages at least are likely to fall in the same general range. This means that the list as a whole is not a very sensitive tool when it is used with non-native speakers: fewer than half the words are really effective items.

A second problem with the Kent-Rosanoff list is again one that derives from its one apparent advantage: the use of frequent words. Almost all the words in the list lie in the highest frequency band - in the French version, for instance, only four words do not appear in either the first or second steps of the *Français Fondamental*. This means that all the words tested are among the first words that a learner acquires in his second language - often at a stage where learning new words is an unfamiliar and strange experience. This has two drawbacks. Firstly, we know very little about how second language vocabulary is acquired, but it seems a reasonable supposition that the early stages of learning a language might produce acquisition patterns that differ quite radically from what goes on when more advanced, fairly fluent speakers learn words. It is possible that the resulting word association behaviour with basic L2 words might be quite different from what happens with more "advanced" vocabulary, and it might be quite wrong to generalize on the basis of what happens with a hundred highly frequent words learned in peculiar circumstances. Secondly, the use of the Kent-Rosanoff lists has had the effect of concentrating attention on a small number of words which form the hard core of the learners' L2 vocabulary, and this has distracted attention away from what is potentially a much more interesting problem: what is happening at the periphery of a learner's vocabulary - how new words are acquired and integrated into the existing word stock.

The third problem with the Kent-Rosanoff list is that the apparent bonus of being able to compare learners' responses with the published norms for native speakers turns out on closer inspection to be of doubtful value. In Meara (1978) I suggested that it was reasonable to expect learners to aim towards producing native-like responses on a word association test, for the simple reason that one wants learners to behave like native speakers in all types of language behaviour. Several people have pointed out to me, however, that this argument is not a good one. Teaching a language aims to produce people who are bilingual, not mere replicas of monolingual speakers. It would, therefore, be more appropriate to compare the associations of learners with those of successful bilingual speakers, and not with native speakers. Unfortunately, of course, the necessary background work needed to make such comparisons has not yet been carried out.

These three reasons, and particularly the first two, seem to me to be strong arguments for abandoning the use of the Kent-Rosanoff list with non-native speakers. It would be nice to be able to suggest a concrete alternative at this stage, but this is obviously very difficult to do. What would count as an appropriate set of stimuli depends very much on what questions you are trying to answer. Perhaps the general point to be made is that experimenters do need to think about their choice of words more carefully. Tried and trusted tools which work for L1 situations are rarely wholly appropriate for L2 situations, and word association research is clearly one of these cases.

The problem of what words to use as stimuli in word association research with non-native speakers is one that requires thought, but not a topic that raises any really important questions. Now that we have got it out of the way, we can pass on to three topics which seem to me to be of rather more interest, both theoretical and practical. These are the stability of learners' associations, what happens to new words as they are acquired, and on a slightly different tack, what we can deduce from obvious errors in word association tests about the way words are stored and handled by learners.

The stability of learners' responses in word association tasks is an important methodological question that has not been generally considered in the literature. We know that native speakers' associations are relatively stable: subjects tend to give the same responses to stimulus words, and this tendency is even more marked if we consider the responses of whole groups of subjects. This means that one can be reasonably confident that a single test is a reliable tool to use with native speakers, and that it is unlikely that a second test would produce wildly different response patterns. It is much less clear that this assumption can safely be made about learners, however. Learners' vocabularies are by definition in a state of flux, and not fixed; learners often tend to give idiosyncratic responses; the indications are that semantic links between words in the learner's mental lexicon are somewhat tenuous - all these considerations would lead one to suspect that learners' responses could be considerably less stable than the response patterns of native speakers. If this turned out to be so, it would severely reduce the value of one-off studies of learners, and it would be impossible to ascribe to studies of learners the same sort of status we usually ascribe to one-off studies of native speakers. It would also mean that considerable caution would be needed in the interpretation of studies such as that of Randall (1981). Randall attempted to relate changes in association responses to measurable changes in the proficiency of a group of EFL learners. However, if learners' responses are generally unstable, then there is no way of deciding whether observed changes are really permanent ones, and thus represent real progress, or whether they are just part of the random flux of the whole system.

We have carried out two studies on stability so far, with a third study planned. These studies show rather mixed results. Morrison (1981) looked at Finnish-English bilingual children and found that they were equally stable, or rather equally unstable, in both languages. This is not very surprising, however, since children tend to be fairly unstable anyway. Hughes (1981), in a bigger and better controlled study of several groups of ESL learners found that responses on the whole were very unstable, but the general level of stability differed considerably from group to group and from word to word. There were, however, no obvious reasons for these discrepancies, and all we can say at the moment is

that it seems safest to assume that learners' word associations are not very stable. This is obviously an unsatisfactory state of affairs, as it effectively inhibits any other research in this area. It is equally obvious, however, that learners' responses are not totally unstable, and our immediate aim is to work out what conditions lead to reasonably stable patterns and what are the causes of the instability.

The second question that has interested us is what happens to new words which are acquired by learners, and how do they become integrated into the learners' mental lexicon? It is often implicitly assumed that learning vocabulary is an immediate all-or-nothing affair - when words are studied, they are either acquired or not. This is a position which seems inherently implausible to me. Most learners have the experience of knowing that they know a word, but being quite unable to say what it means, even though looking the word up in the dictionary produces an instant 'of course!' reaction. This experience and others like it, suggest that learning vocabulary is not just a question of pairing L2 stimuli and L1 meanings often enough for them to be 'learned'. Some sort of complex absorption processes are likely to be involved, which allow words which have just been met to gradually find their proper place in the learner's L2 lexicon. Perhaps it would be possible to tap this process by recording the associations made to new words and observing how these associations change over a period of time?

So far we have carried out one experiment on these lines (see Beck 1981 for details). A group of English speaking students learning French at 'A-level' were given a list of forty French words that they were unlikely to know, and asked to produce chains of responses to each one. Not surprisingly this produced few responses overall, a large number of clang-type responses and only a handful of native-speaker-like responses. Subsequently twenty of the words were introduced into the students' class-work in a non-obtrusive fashion, and two further tests were given over a twelve week period. The results of the first re-test showed that there was no real change in the responses to the words that had not been used in class teaching. They still produced a low level of total responses, lots of clang associations and few native-speaker-like responses. In contrast, the taught words changed markedly, producing a greater number of total responses, fewer clang associates, and a greater proportion of native-like responses. The second re-test again showed no change in the untaught words. The taught words showed a slight decline in the total number of responses they evoked, but an increase in the proportion of native-like responses.

This data clearly confirms the view that learning vocabulary is not an instantaneous process. Changes are still taking place twelve weeks after the initial presentation of the taught words. Indeed, given that the total number of responses was far short of what one would expect of a fluent speaker, and given that the number of native-like responses was less than 20% of the total, it seems plausible to suggest that the integration of these words was far from complete, and that these changes are likely to continue for quite long periods of time. The questions to be asked at this stage, then, are: how long does this stabilizing period last? is it the same for all words and for all learners? what environmental factors reduce or extend it? It should be possible to get answers, at least, of a preliminary sort, to all these questions by means of word association tests, and further work along these lines is projected.

The third question which is currently interesting us concerns the large proportion of responses made by learners which are clearly ascribable to errors - either errors in the identification of the stimulus word or error in the choice of a response. These errors bear some resemblance to the sorts of errors native speakers of English make when they produce malapropisms. The errors listed in table one, for example, show that certain features of the target tend to be preserved - initial consonants and salient consonant clusters seem to be fairly robust, while vowels and medial syllables seem to be particularly vulnerable, and these are the same features that crop up consistently in work on errors in English as an L1. This suggests that the mechanisms which underlie vocabulary errors in a L2 might be closely to the sources of errors of vocabulary in an L1. Given that such errors typically occur with infrequent words, and that L2 words are by definition relatively infrequent items in the learner's total word stock, this is perhaps not very surprising. Nevertheless, it does suggest that the traditional emphasis on L2 as a self-contained, independent system may be an unhelpful one, at least as far as vocabulary is concerned, and that a lot might be gained if we began to consider the learner's total vocabulary, in all the language he knows, as an integrated whole, and not just as a set of small discrete components.

**Conclusion**

This paper has discussed some of the findings and some of the interesting problems that have arisen out of our work on word associations - itself part of a wider project on Vocabulary Acquisition in a Second Language. Vocabulary Acquisition is generally considered to be a topic of little inherent interest and of slight theoretical importance, and even on the practical level it is very often ignored or treated in a cavalier fashion. I hope that this paper will help to convince sceptics that these attitudes are unjustified, and that vocabulary acquisition is not just an interesting area to work on, but potentially quite an exciting one too. Any reformed sceptics who would like to collaborate on work of this sort are warmly invited to contact me at Swansea.

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