Development of Word Associations in a Second Language

Author(s): Deborah Piranian

Proceedings of the Ninth Annual Meeting of the Berkeley Linguistics Society (1983), pp. 202-210

Please see “How to cite” in the online sidebar for full citation information.

Please contact BLS regarding any further use of this work. BLS retains copyright for both print and screen forms of the publication. BLS may be contacted via <http://linguistics.berkeley.edu/bls/>.

The Annual Proceedings of the Berkeley Linguistics Society is published online via [eLanguage](#), the Linguistic Society of America's digital publishing platform.

Development of Word Associations in a Second Language
 Deborah Piranian
 University of Washington

Introduction. A major question in the field of second language acquisition is: In what ways is second language (L2) acquisition similar to first language (L1) acquisition? Comparisons between L1 and adult L2 acquisition are important not only for understanding the acquisition process of L2, but also that of L1. They help answer the question of the roles of cognitive development versus language experience in L1 acquisition. A similarity in any component of the two processes rules out cognitive factors for that component. The similarity must reflect a universal property of language acquisition or a property inherent in the specific language. On the other hand, differences between L1 acquisition and adult L2 acquisition could be the result of cognitive factors or affective factors, such as motivation.

Most of the work in L2 research has focused on phonology, morphology, syntax, and, more recently, discourse, which are areas that have interested linguists in general. The lexicon has been neglected, as noted by Levenston (1979), Meara (1980), and Cohen and Aphek (1981).

There are several reasons to turn our attention to the lexicon. First, it is a major component of language. Second, students often cite vocabulary as one of the biggest problems in L2 learning. Understanding the acquisition process may have pedagogical implications. Third, there is sufficient research on certain aspects of the lexicon in L1 to allow comparisons between L1 and L2, once we have the corresponding data for L2.

The aspect of the lexicon dealt with in the present paper is lexical organization as reflected in word associations. It has been studied extensively in native speakers (NS). (See Cramer, 1968.) The methodology basically involves giving subjects a list of words and asking them to respond to each word with the first word that comes to mind. Definite patterns appear when one compares stimuli and responses. These patterns are surprisingly stable within a given language group.

Three important classifications of responses are: paradigmatic (Pr), syntagmatic (Syn), and phonological (Ph) (also known as "clang"). A Pr response is of the same word class as its stimulus. A Syn response is of a different word class. These two types are mutually exclusive, i.e. a response cannot be both Pr and Syn. A Ph response, as the term implies, resembles its stim-

ulus in sound. A Ph response can be either Pr or Syn, although the term is usually used for a response that has no apparent semantic or syntactic connection to the stimulus. As an example, suppose red were a stimulus. Blue would be a Pr response, apple a Syn response, and bed a phonological response.

Word association patterns within a language vary depending on a number of factors. One is the word class of the stimulus. Adult NSs of English give about 80% Pr responses to nouns, about 50% to verbs and adjectives, and about 20% to prepositions (Deese, 1962; Palermo, 1963).

Frequency in normal usage is also related to Pr responses in English, at least for adjectives. Deese (1962) reported a correlation of .40 between frequency of Pr responses and frequency of usage for adjectives, but no correlation for other word classes. Stolz and Tiffany (1972) found that adult NSs of English gave about 43% Syn responses to adjectives they knew, but 64% Syn responses to unfamiliar adjectives. These two studies suggest that experience or familiarity with an adjective relate to responding paradigmatically.

Another factor related to response patterns is age. One age difference is that young children give many more Ph responses than older children or adults (Entwisle, Forsyth, and Muuss, 1964). Another age difference is the proportion of Pr and Syn responses. Children tend to give Syn responses and adults Pr ones. For example, blue would be a typical adult response to red, and apple a typical child response. From about age six to ten, children's responses become more adult-like, i.e. the number of Pr responses increases. This change is referred to as the syntagmatic-paradigmatic shift. It seems to be cross-linguistic. It has been reported for a variety of languages including French (Rosenzweig and Menahem, 1962), Slovak (Maršálová, 1975), and Kpella, a language in Liberia (Sharp and Cole, 1972).

Two types of explanations have been given for the Syn-Pr shift. One is language experience. This has been proposed, in varying forms, by a number of researchers (Brown and Berko, 1960; Ervin-Tripp, 1967; McNeill, 1963; and Entwisle et al., 1964). The second explanation is cognitive development. Francis (1972) supports this one. She claims that the shift is due to a "reorganization of the mental filing system" resulting from changes in cognitive abilities. As evidence of these cognitive changes, she cites changes in the speech and thinking of children at this age.

A look at the development of adult L2 word associations might resolve the conflict between the two explanations. If Francis is right, one should not find

the Syn-Pr shift in the adults' associations. If the explanation is language experience, one might find the shift. Failure to find the shift does not automatically support a cognitive explanation since it might be language experience in general, and not just experience with the specific language.

Word association patterns differ depending on the language. As far as the Pr-Syn distinction is concerned, English produces more Pr responses than Polish, French, or Navaho (Shugar and Gepner-Więcko, 1971; Rosenzweig and Menahem, 1962; Ervin and Landar, 1963).

The number of studies on Pr and Syn response patterns in bilinguals or L2 learners is limited. Shugar and Gepner-Więcko examined the associations in English and Polish of advanced Polish university students majoring in English. They found that the percentage of Pr responses on the English test approximated that of American norms and on the Polish test - that of Polish norms. These findings suggest that the tendency to give a Syn or Pr response depends on the language, not the speaker.

Vertogradskaja (1975) considered changes in response patterns as L2 (Russian) proficiency increased. She reported more Syn responses at the lowest level and an increase in Pr responses in the two higher levels. These results seem to parallel those found for children. Unfortunately, her study had only 20 subjects and 30 stimuli, and her report is too brief to evaluate.

The number of Ph responses in L2 associations has also been noted. Reigel and Zivian (1972) found more Ph responses at the lower levels of German (the L2) than at the higher levels. Meara (1978) reported a large number of Ph responses from lower level French L2 learners.

There is other research supporting the idea that students at lower proficiency levels use form versus meaning to handle vocabulary. Henning (1973) looked at errors in remembering L2 vocabulary in English and Persian. He found that level correlated positively with semantic errors and negatively with phonological errors.

Purpose of the study. In order to compare the development of lexical organization in L1 and L2, the word association patterns of L2 learners at different proficiency levels were examined. The study attempts to answer the question: Do the Pr, Syn, and Ph response patterns of L2 learners change with proficiency in the same way as the patterns change in L1 with age?

Two predictions were made. First, a shift from predominantly Syn responses at the lower levels to more Pr responses at the higher levels was predicted. In other words, L2 development was expected to parallel

that of L1. This prediction was based on Vertograd-skaja's limited study and on the findings described above that Pr responses correlate with familiarity of adjective stimuli. The second prediction was that lower level subjects would give a larger number of Ph responses and that this would decrease as proficiency increased. This prediction was based on the work cited above by Reigel and Zivian (1972), Meara (1978), and Henning (1973).

Procedures. The subjects were 73 American university students studying Russian and 17 NSs of Russian who had recently emigrated from the Soviet Union. The students were all NSs of English. They were divided into four proficiency levels based on the class level: 29 first-year students, 15 second-year students, 17 third-year students, and 12 fourth-year students.

Two word association tests were given, one in Russian and one in English. They were translation equivalents. Each consisted of 70 common words of the following word classes: 20 nouns, 20 adjectives, 20 verbs, and 10 prepositions. Subjects were told to "read each word and write the first Russian/English word that comes to mind." Responses were to be single words. Subjects were encouraged to work quickly.

The NSs of Russian, who received only the Russian version, were tested individually or in small groups. The students were tested at the beginning of their regular Russian class. The Russian version was given first, followed about ten days later by the English version. Subjects took less than ten minutes to complete the L1 tests and less than fifteen for the L2 tests.

Each response was classified as either Pr or Syn, depending on whether it was of the same word class as its stimulus. In addition, each Russian response was rated as Ph or not Ph based on fixed phonological criteria.

Results. One-way analysis of variance and Scheffé tests were used to compare the five proficiency levels (four L2 and the NSs) with respect to the two classifications of responses, Pr versus Syn and Ph. The results for the Pr-Syn distinction are presented in Table 1. The only significant difference between the groups is for the noun stimuli. Even for this class of stimuli, the significant difference is between the L2 learners and the NSs, but not between the different L2 groups.

These results do not support the original prediction that there would be developmental changes in the L2 responses similar to those in L1, i.e. a Syn-Pr shift. In fact, there do not appear to be any developmental changes in the Pr-Syn pattern. It is interesting

to note that the L2 percentages are similar to those reported by Deese and Palermo for adult NSs of English (see above).

Table 1. Mean Percentages of Pr Responses.

	Level 1	2	3	4	NS	F	p
Stimulus							
noun	65	77	69	66	35	9.40	.000
adj.	32	44	37	43	32	.74	.570
verb	47	37	38	45	35	.71	.583
prep.	24	35	38	30	28	.70	.590

The comparison of the five groups with respect to Ph responses shows a different pattern (Table 2). Significant differences exist between the groups for each class of stimuli. Furthermore, the differences are not just between the NSs and the L2 learners, but between the L2 levels as well. The largest number of Ph responses were given by the lower level learners, and this number decreases as proficiency increases. Based on the Scheffé test, which determines significantly different subgroups, the levels can be grouped as follows for noun, adjective, and verb stimuli. Each line repre-

NOUNS:

NS 4 3 2
4 3 2 1

ADJECTIVES:

NS 4 3
4 3 2
2 1

VERBS:

NS 3 2 4
3 2 4 1

sents a subgroup, and the order from left to right indicates increasing order of the mean percentages. Thus for nouns, levels 4, 3, and 2 and NS do not differ significantly from each other, nor do levels 4, 3, 2, and 1. However, level 1 and NS are significantly different. There is a clear progression related to proficiency level in the three classes of stimuli. It is not perfect for verbs in that level 4 is higher than 2 and 3. However, the three levels together form an intermediate group between level 1 and NS and do not differ much from each other.

Table 2. Mean Percentages of Ph Responses.

	Level 1	2	3	4	NS	F	p
Stimulus							
noun	18	13	11	9	6	5.04	.001
adj.	25	18	9	7	2	9.40	.000
verb	32	22	22	26	13	3.79	.007
prep.	13	5	5	3	8	3.56	.010

The results for Ph responses confirm the prediction that subjects at lower proficiency levels would give more Ph responses and that this type of response would decrease at the higher levels.

Pearson correlation tests were used to determine whether subjects tended to give consistently Pr or Syn responses. The results (Table 3) indicate an "individ-

ual style" for the L2 learners and, even more strongly, for the NSs. In other words, a subject who tends to give a Pr response to one word class of stimuli also tends to give Pr responses to the other word classes.

Table 3. Pearson Correlations for Pr Responses.

	L2 Learners			Native Speakers		
	adj.	verb	prep.	adj.	verb	prep.
noun	.59	.59	.59	.90	.95	.87
adj.		.70	.66		.86	.85
verb			.64			.87

$p \leq .001$

The lack of significant differences between the L2 groups in Pr responses and the similarity with means from previous research for English raise the question of transfer. Do the L2 learners transfer the patterns of Pr-Syn responses from their native language (English) to the L2 (Russian)? We can begin to answer this question by comparing the responses to the English version with those of the Russian one. Table 4 presents mean percentages of Pr responses from the American students in English and Russian, from published norms for English, and for the NSs of Russian.

Table 4. Mean Percentages of Pr Responses.

	English norms*		Russian L2	Russian NS
noun	78	79	69	35
adj.	64	50	37	32
verb	52	48	43	35
prep.	60	22	30	28

*The figures for nouns, adjectives, and verbs are from Deese (1962), the one for prepositions is from Palermo (1963).

The comparison does not give a clear and consistent picture. For noun stimuli, it looks as though the L2 learners do transfer the tendency to give Pr responses. The figures for verbs could also be interpreted in this way, although the difference between the two Russian means is not significant. The percentages for adjectives and prepositions are more confusing. The L2 Russian percentages are close to the published English norms, but not to those from the English test used in this study. Is it the result of the test absent? The results for the noun stimuli make it difficult to answer "yes" to the last question.

Pearson correlations between Pr responses in English and in Russian were used to examine the question of transfer. The correlation coefficients for each word class of stimuli were as follows: .53 for nouns, .48 for adjectives, .41 for verbs, and .64 for prepositions. Although the correlations are not as strong

as those for the Pr responses within a language (see Table 3), the L2 learners do appear to have an "individual style" that is employed regardless of the language of the test.

Conclusions. The developmental changes in Ph responses found in this study parallel those reported in L1 development. This implies that the development is not related to cognitive development or to exposure to language in general. It is related to experience with the specific language. At the early stages of language acquisition, either L1 or L2, a person has only a very limited "semantic network." The number of known words is small, and the network of meanings connected to individual words is incomplete. As a result, semantics is not an efficient basis for organization. However, sound or form is efficient, especially since there are so few items (words) to organize. As the speaker develops the semantic component of the specific language, there is both sufficient material and motivation (efficiency) to change the criterion for the organization of the lexicon from form to meaning.

The lack of developmental changes in Pr-Syn response patterns in the present study does not parallel the development found in L1, i.e. the Syn-Pr shift. The dissimilarity suggests that the shift in L1 is related either to cognitive development or to experience with language in general.

The results reported here suggest two possible lines of further research. If experience with the language is related to the development of word associations, the type of experience may be crucial. Vertogradskaja's results (see above) suggest similarity between L1 and L2 development. One difference between her study and the present one is the acquisition situation. Her subjects were in the environment where the L2 was spoken. The subjects in the present study were not. Most, if not all, of their experience with Russian was in the classroom. One direction of research would be to compare the development of associations for subjects acquiring the L2 in a formal setting with those for subjects in an informal, "natural" setting.

The second line of research concerns the question of transfer of Pr-Syn response patterns from the native language. If transfer does take place, response patterns in a given language should differ for groups of L2 learners of different native languages. Thus, for example, one could extend the present study by examining the Russian response patterns of French, Polish, and Japanese L2 learners and by comparing them with patterns in the native languages.

Notes.

1. Shugar and Gepner-Więcko's results (see above) suggest that L2 patterns can be like those of native speakers of the target language even though the L2 was learned in a formal environment. However, it is not known from the report whether the subjects (students) had ever been in an English-speaking country or in other "immersion" situations.

Bibliography.

- Brown, R. and Berko, J. (1960). Word association and the acquisition of grammar. Child Development, 31,1-14.
- Cohen, A. and Aphek, E. (1981). Easifying second language learning. Studies in Second Language Acquisition, 3,3,221-236.
- Cramer, P. (1968). Word Association. New York: Academic Press.
- Deese, J. (1962). Form class and the determinants of association. Journal of Verbal Learning and Verbal Behavior, 1,79-84.
- Entwisle, D., Forsyth, D. and Muuss, R. (1964). The syntagmatic-paradigmatic shift in children's word associations. Journal of Verbal Learning and Verbal Behavior, 3,19-29.
- Ervin-Tripp, S. (1967). Changes with age in the verbal determinants of word-association. In Readings in the Psychology of Language, pp.530-540. Edited by L. A. Jakobovitz and M. S. Miron. Englewood Cliffs: Prentice-Hall, Inc.
- Ervin, S. and Landar, H. (1963). Navaho word-associations. American Journal of Psychology, 76,49-57.
- Francis, H. (1972). Toward an explanation of the syntagmatic-paradigmatic shift. Child Development, 43,949-958.
- Henning, G. (1973). Remembering foreign language vocabulary: acoustic and semantic parameters. Language Learning, 23,185-196.
- Levenston, E. A. (1979). Second language acquisition issues and problems. Interlanguage Studies Bulletin, 4,2,147-160.
- Maršálová, L. (1975). Schematic associations in Slovak language. Studia Psychologica, 17,1,31-40.
- McNeill, D. (1963). The origin of associations within the same grammatical class. Journal of Verbal Learning and Verbal Behavior, 2, 250-262.
- Meara, P. (1978) Learners' word associations in French. Interlanguage Studies Bulletin, 3,2,192-211.
- Meara, P. (1980) Vocabulary acquisition: A neglected aspect of language learning. Language Teaching and Linguistics: Abstracts, 13,4, 221-246.

- Palermo, D. (1963). Word associations and children's verbal behavior. In Advances in Child Development and Behavior, Volume 1. Edited by L. Lipsitt and C. Spiker. New York: Academic Press, 1963.
- Riegel, K. and Zivian, W. (1972). A study of inter- and intralingual associations in English and German. Language Learning, 22, 51-63.
- Rosenzweig, M. and Menahem, R. (1962). Age, sexe et niveau d'instruction comme facteurs déterminants dans les associations de mots. L'Année Psychologique, 62, 45-61.
- Sharp, D. and Cole, M. (1972). Patterns of responding in the word associations of West African children. Child Development, 43, 55-65.
- Shugar, G. and Gepner-Więcko, K. (1971). Effect of language structure on associative responses to word equivalents in two languages. A cross-linguistic comparison of word associations in Polish and English. Polish Psychological Bulletin, 2, 2, 99-105.
- Stolz, W. and Tiffany, J. (1972). The production of "child-like" word associations by adults to unfamiliar adjectives. Journal of Verbal Learning and Verbal Behavior, 11, 38-46.
- Vertogradskaja, E. A. (1975). Opyt obraščeniya k verbal'nyh assocacijam dlja issledovaniya formirovaniya mexanizma perenosa pri izučenii inostrannogo jazyka (A verbal association experiment to study the transfer mechanism in the learning of a foreign language). Voprosy Psixologii, 1, 130-132.