

*Judit Navracsics**

University of Veszprém, Hungary

WORD ASSOCIATION TEST AMONG BILINGUALS

The focus of this article will be a word association test that was carried out on 30 adult bilinguals. The test of 188 stimulus words is identical with one given to Hungarian monolinguals in the Debrecen region. In this way it is a suitable corpus for the comparison of word associations among monolinguals and bilinguals. Word association tests tell about the composition and structure of the mental lexicon. It is essential to see how the languages spoken by bilinguals are related to each other. We therefore need to ask the following questions: Do the different types of bilinguals treat their languages as they are supposed to according to Weinreich? Are there any determining factors that influence the response to a given stimulus? Are these factors merely of semantic character? Are there certain categories which as a rule trigger code-switching? I have been collecting bi- and multilingual data from subjects whose first or second language is Hungarian and who became bilinguals at different ages. In this paper I will share the first results of the investigation.

Key words: bilinguals, word association, relations between languages, mental lexicon

INTRODUCTION

The mental lexicon, as a bridge between form and meaning, plays a crucial role in any model of language processing. In the mental lexicon information from all different linguistic levels is combined. Phonology, orthography, syntax, argument structure, morphology and lexical semantics all appear in the entries of the mental lexicon (Aitchinson, 1987).

In the study of bilingualism, the lexical level of language is of prime importance because vocabulary acquisition is a prerequisite of language use. Also, some theoretical issues become important such as whether words are stored in one lexicon or two? The lexicon of a bilingual may change over time as information is added, reorganised, or even lost. Leopold (1939) recognized the coordinate/compound/subordinative distinction before it was labelled as such by Weinreich (1953). The three differ from one another in two ways: the number of underlying conceptual system(s) that the bilingual possesses (one or two) and, in the case of a single conceptual system, the way in which this system is accessed when a second language word is input (directly or indirectly via the corresponding native language word).

Coordinate bilinguals possess one signified for every signifier. Compound bilinguals possess only one set of signifieds with two signifiers for each signified. Subordinative bilingualism is the third type, when only one language is mastered and the second is in the process of being learned. A subordinative bilingual may link the to-be-learned word to its translated equivalent in his native language rather than directly onto a conceptual form. In this case, the

* Judit Navracsics, University of Veszprém, Department of Applied Linguistics, Veszprém, Egyetem u. 10, 8200 Hungary; Phone/Fax: +36 88 406 360; e-mail: navracsj@almos.vein.hu

second language word presents its conceptual representation indirectly *via* its translated equivalent in the learner's first language.

The distinction between compound and coordinate bilingual language systems has also been referred to as the "common storage", or "shared storage" hypothesis *versus* the "separate storage" hypothesis. Compound bilingualism is thought to develop in homes where two languages are spoken interchangeably by the same people and in the same situations (typical of linguistic minority speech communities). In contrast, coordinate bilingualism is regarded to be the consequence of a strict separation between the use of the two languages, for example when language A is used exclusively at home and language B exclusively outside the home, or when a child is brought up in the "one parent – one language" fashion. Coordinate bilingualism, on the other hand, emerges when the bilingual's two languages are acquired in two totally distinct national or cultural settings. According to Lambert *et al.* (1958), different language acquisition contexts can lead to different representational systems. In this study, I have given a free word association test to 30 bilingual adults in order to see the relationships between their languages and the ways in which information is stored in their mental lexicons.

METHODS: SUBJECTS, AND DATA COLLECTION

Free word association is an experimental technique designed to determine the extent to which a given bilingual has stored his or her lexical knowledge of the two languages in a compound or coordinate manner. The subjects were given the task of saying the very first free associations to 188 Hungarian stimulus words. The stimulus words were identical with those enumerated by Balló (1981, 1983) and Jagusztinné (1985), who administered them to Hungarian monolinguals back in 1979 and 1981 in the Debrecen region. Thus the corpus is suitable for comparison regarding monolingual and bilingual word association reactions. The test was oral and audiotaped, unlike the monolingual corpus which was gained from a written test and not recorded. Due to the oral test there might have been some mishearings, about which I will speak in the Results section of this article. No restrictions were given concerning language use. Responses in both languages were permitted regardless of the language of the stimulus word. Thus 5640 response items are under investigation.

The following two tables contain the most important information about the bilingual subjects whose free word association test is the focus of attention in this paper. I have separated them according to type of bilingualism. That is, Table 1 represents only the compound bilinguals; Table 2, the coordinate bilinguals.

Table 1. List of compound bilinguals

Name	Languages	Type	Age
P. József	Hungarian-German	compound	80
R. József	Hungarian-German	compound	70
Anna	Hungarian-German	compound	63
Melinda	Hungarian-Serbian	compound	20
Boglárka	Hungarian-Rumanian	compound	20
Ingrid	Hungarian-Slovak	compound	20

Marika	Hungarian-Slovak	compound	30
Erich	Hungarian-Slovak	compound	33
Viki	Hungarian-Slovak	compound	10
Bernadette	Hungarian-Rumanian	compound	20
Sándor	Hungarian-Ukrainian	compound	23
Anita	Hungarian-German	compound	26
Árpád	Hungarian-English	compound	18
Attila	Hungarian-English	compound	24
David	Hungarian-English	compound	26
Doris	Hungarian-English	compound	20

Table 2. *List of coordinate bilinguals*

Name	Languages	Type	Age
Ali	Arabic-Hungarian	coordinated	48
Heinrich	German-Hungarian	coordinated	38
Ahmed	Arabic-Hungarian	coordinated	25
Mondo	Swahili-Hungarian	coordinated	25
Há	Vietnamese-Hungarian	coordinated	14
Amanda	English-Hungarian	coordinated	28
Massimiliano	Italian-Hungarian	coordinated	30
Tereza	Polish-Hungarian	coordinated	53
Anara	Khirgiz-Hungarian	coordinated	49
Galina	Russian-Hungarian	coordinated	45
Nagyezsda	Russian-Hungarian	coordinated	43
Krisztina	German-Hungarian	coordinated	40
Marzena	Polish-Hungarian	coordinated	40
Olga	Russian-Hungarian	coordinated	40

Of the 16 compound subjects there were 7 males and 9 females, whereas among the coordinate bilinguals there were 5 males and 9 females.

The compound bilinguals were all from linguistic minority communities either in Hungary (Pászner J., R. József, and Anna) or abroad (Melinda, Boglárka, Ingrid, Marika, Erich, Viki, Bernadette, and Sándor), except for Anita, Árpád, Attila, David, and Doris, who were born abroad and were members of Hungarian families in which the language of the home was mainly Hungarian, but whose parents often used mixed language.

The coordinate bilinguals came to Hungary well after puberty, that is, after the well-known Penfieldian Critical Period. Heinrich, Ahmed, Mondo, and Ali came to Hungary to study here. Há came with her mother, Amanda as a missionary, and Massimiliano as a busi-

nessman, Tereza, Anara, Galina, Nagyezsda, Olga, Krisztina, and Marzena all moved to Hungary in their early twenties with their Hungarian husbands.

RESULTS

The 5640 items are categorized according to the links between the prime word and the activated words. The following links were invented during the test: semantic, syntactic, lexical equivalents, morphological, phonetic. Besides these categories, I made up two additional ones: the "zero" category, for when there was no answer, and the "random" category, for cases when no particular connection between the stimulus and the response could be interpreted.

The **semantic** category is made up of responses, regardless of which language, that belong to the same semantic field. These include synonyms, antonyms, and idioms. **Syntactic** links can be identified if there are common phrases which contain the stimulus word and the response. The **lexical** category assumes a direct association between the lexical representations of the stimulus and response in the bilingual's two languages. The **morphological** category comprised those words which were chosen as a result of word formation, compound words, affixation, *etc.* The **phonetic** category consists of associations based on the sounds of words. These responses were given for different reasons: they may be identical in pronunciation (hold – hold), or they may be very similar due to neighborhood effects, cognate status and homophonic noncognate status. Translation equivalents are cognates if they are similar in sound and/or spelling. In the case of phonetic dissimilarity, they are noncognates. Both homographic and homophonic noncognates (false friends) are words spelled or uttered identically in the two languages, but which have totally different meanings. Table 3 gives us the number of items in each category:

Table 3. Number of associations in each category.

Name	Semantic	Syntactic	Lexical	Morphological	Phonetic	Random	Zero
P. József	105	55	1	9	1	17	0
R. József	43	109	6	19	0	10	1
Anna	40	106	0	16	0	19	7
Tereza	67	81	0	27	0	1	12
Anara	5	3	129	0	0	1	50
Ali	89	49	0	11	2	36	1
Galina	97	39	26	6	2	6	12
Nagyezsda	59	88	4	13	3	16	5
Marzena	50	62	4	6	0	58	8
Krisztina	81	64	0	11	2	23	6
Olga	79	41	2	9	3	33	21
Heinrich	40	77	1	40	2	20	8
Erich	92	57	0	16	0	15	8
Marika	143	12	1	1	1	17	13
Massimiliano	118	39	1	8	0	13	9

Amanda	8	1	140	2	26	3	8
Anita	85	50	6	6	0	19	22
David	99	2	66	9	0	2	10
Ahmed	101	16	9	4	0	34	24
Mondo	96	36	6	13	2	16	19
Attila	121	18	19	7	2	18	4
Sándor	9	0	168	0	0	0	11
Boglárka	134	4	16	10	2	21	1
Doris	112	6	49	3	0	18	0
Ingrid	105	23	18	3	0	36	3
Melinda	32	74	1	10	1	41	18
Bernadette	142	24	0	3	0	14	5
Árpád	64	24	63	8	0	27	2
Há	54	30	61	4	0	39	0
Viki	125	16	1	15	2	14	15

Contrary to my expectations, it was not always the case that compound bilinguals gave responses with semantic links or coordinates with lexical equivalents. It is true, however, that compound and coordinate structures may coexist within a single individual's lexicon.

The storage format may also depend on the word type. It appears that concrete words and cognates are relatively often stored in a compound fashion, while abstract words and noncognates are more likely to be stored in a coordinate fashion.

DISCUSSION

Types of bilinguals and the relational links

Among the compound bilinguals there are 12 for whom semantic links are dominant in their mental lexicon. Three people have predominantly syntactic links, and one (Sándor) has mainly lexical equivalents.

Anna and József lived in Leipzig in their youth and only in the past few years have they been visiting Hungary quite regularly. Their use of lexical equivalents is not significant, they rarely switch to German, and they are more likely to create phrases with the stimulus word.

Boglárka, Bernadette, Ingrid and Melinda were brought up in a Hungarian minority territory abroad, where the language of the society was other than the home language. Their home language was Hungarian with a lot of Rumanian, Slovakian, and Serbian elements. In other words, they were exposed to a rather mixed language input. They – as they claim – picked up the language of the society in the street; they do not even know how. The way in which they were exposed to languages had an impact on the structure of their lexicon; and so they store the information on a semantic basis. Very few lexical equivalents were observed, but those few were tightly connected with everyday things, and activities, such as *kenyér* (bread), *ünnep* (holiday), *szoba* (room), *ígér* (promise), *ért* (understand), *gondol* (think), etc.

Marika, Erich, and Viki are a family and have predominantly semantic links and only one lexical equivalent in their lexicons. Interestingly enough, this is the same word: *rend* (or-

der). They live in a Hungarian minority territory in Slovakia right along the border where the majority of people are Hungarian and Hungarian is the prestigious language.

Doris, David, Attila, and Árpád were born in Hungarian families in England or the US. When the children were adolescents, the families returned to Hungary. All of them have mainly semantic relations. However, the second biggest category among their responses is that of lexical equivalents (Doris: 27%, David: 35%, Attila: 10%, Árpád: 33.4%), and there are hardly any phonetic, morphological, or syntactic networks observable in their tests.

In the case of coordinate bilinguals, I expected a lot of lexical equivalents. However, only Amanda (78%), Anara (69%) and Há (32%) upheld my hypothesis. On the contrary, there were quite a few (7) subjects who had predominantly semantic relations in their lexicon (Ahmed, Ali, Galina, Krisztina, Massimiliano, Mondo, Olga). The four remaining people had syntactic links.

Relational categories

The **semantic category** is made up of different semantic relations, among which the most significant are the use of antonyms and part-whole relationships. Some synonyms are also retrieved, but not too often. Tereza's synonyms tell us about her incredibly rich vocabulary. Concrete words also elicit semantic relations like in the following examples: *szín* (color) – Benetton, *éhes* (hungry) – tortellini, *gyors* (fast) – Paolo Rossi, etc. Surprisingly enough, quite a few idioms are used by Tereza and Heinrich, who are both language teachers: e.g., *lassú víz partot mos* (still waters run deep), etc. Some cultural elements are also involved, among which the most interesting is that both Arabic-Hungarian bilinguals, unaware of the other's reaction, gave the same response to the stimulus carpet – flying.

Abstract words tend to elicit **syntactic links**. The following structures build the syntactic category: Adj. + Noun, Noun + Adj., Adv. + Verb, Verb + Adv., or creating a whole phrase with the stimulus word. Tereza and Heinrich are very active in using syntactic links. They must have learned the language in situational contexts. The response of Tereza to the word *allni* (stand) – *a nehézségeket* (difficulties).

Lexical equivalents are interesting to study in Há's and Sándor's tests. They both involve several languages while retrieving the response word. In Há's test, not only Vietnamese (46%) but also English (38%), German (13%), Latin, and Russian equivalents can be found. In Sándor's case Russian (72%), German (20%), Ukrainian (5%), and English (3%) can be traced, which indicates his Sub-Carpathian multilingualism.

Morphological links can be found when the response has the same root as the stimulus word, but when the stimulus word is morphologically changed: either by any type of word formation or by affixation. This category may be a subcategory of the semantic one, since words from the same root belong to the same semantic field, as a rule. A significant number of morphological links can be observed in Tereza's, Heinrich's, Anna's, and R. József's test, for example table – table cloth, free – freedom, moon – moonlight.

Phonetic links appear due to homophonic noncognates (*fut* – foot, *hold* – hold, *hely* – hey, *mély* – may, *szem* – Sam), neighbouring effects (*beszél* – sailboat, *eredmény* – main, *orosz* – rossz, *rész* – részeg, *tolvaj* – toll, *drága* – dragon, *tér* – tear, *vaj* – wire, *öröm* – a room, *ígér* – égér, *jog* – yoga, *szőnyeg* – szűnyog, *egyszerű* – nagyszerű, *igazság* – egészség, *tér* – rét *szár* – büdös, *szár* – király, *szék* – vállalat).

The last three words are most probably due to phonetic mishearings. There is one response which I consider a cognate: the response *add* and the stimulus *ad*. These two words have very similar meanings and they are almost homographs. Perhaps the written form of the word made an influence on the retrieval of the response.

Random responses cannot be explained at all. They turn out to be totally distant from a semantic or syntactic point of view from the stimulus word. Some stimulus words also make the

testees express their own feelings, and these answers are also categorised as random responses (health – good to have, grandmother – I love her, man – trouble, music – very important).

CONCLUSION

There is not a single subject who does not have at least four categories out of the six in their mental lexicon. Compound and coordinate structures can coexist. Also, the contents of the mental lexicon change all the time, and a once coordinate bilingual sometimes becomes a compound one after some time. The organization of the mental lexicon of a bilingual is determined by the way the person acquired the second language, and also by the time spent in the second language environment. Having spent several years in a different country will cause changes in the lexicon. In this case it is not the lexical equivalent that counts anymore, but rather the concept. Once a bilingual uses his/her language on a regular basis, the semantic content becomes activated independently of the language. According to Kroll (1993), the important questions to ask are: What is the nature of the task given to the subject, what is the quality of the second language competence, and whether or not lexical level links between the two languages can be tracked down.

The semantic networks that appear most frequently indicate that it is conceptual meaning which is important and not linguistic manifestation. At the same time, these findings show that the languages of bilinguals are in a very tight relationship with one another. Even if the lexical equivalents are stored in different centers, these centers are always intertwined. This gives a reasonable explanation for the occurrence of the phonetically based cross-linguistic associations.

REFERENCES

- Aitchinson, J. (1987). *Words in the Mind*. Oxford: Blackwell.
- Balló, L. (1981). 188 magyar szó leggyakoribb asszociációi. *Magyar Nyelv* LXXVII. 462–466.
- Balló, L. (1983). *Magyar verbális asszociációk 1*. Szeged: JGYTF.
- Jagustinné, U. K. (1985). *Magyar verbális asszociációk 2*. Szeged: JGYTF.
- Kroll, J. (1993). Accessing Conceptual Representations for Words in a Second Language. In: Schreuder és Weltens (szerk.) *The Bilingual Lexicon*. Amsterdam/Philadelphia: John Benjamins. 53–83.
- Lambert, V. E., Havelka, J. and Crosby, C. (1958). The Influence of Language Acquisition Context on Bilingualism. *Journal of Abnormal and Social Psychology* 56, 239–244.
- Leopold, W. (1939). *Speech Development of a Bilingual Child: a linguist's record. I. Vocabulary Growth in the First Two Years*. Evaston: Northwestern University Press.
- Weinreich, U. (1953). *Languages in Contact. Findings and Problems*. New York: Humanities Press.

ASOCIJACIJE MEĐU RIJEČIMA U BILINGVALA

Sažetak

U članku je opisan test asocijacija među riječima proveden na uzorku od 30 odraslih bilingvala i poliglota kojima je jedan od jezika koji govore mađarski. Testovi asocijacija otkrivaju sastav i strukturu mentalnog leksikona. Kako bismo otkrili odnose među jezicima koje bilingval govori, moramo postaviti sljedeća pitanja: Tretiraju li različiti tipovi bilingvala jezike koje govore na očekivani način, tj. u skladu s karakteristikama tipa bilingvizma kojem pripadaju? Ima li čimbenika koji određuju odgovor na zadani podražaj? Jesu li ti čimbenici isključivo semantički? Ima li kategorija koje u pravilu potiču na promjenu jezika unutar izričaja (*code switching*).

Ključne riječi: bilingvali, asocijacije riječi, odnosi među jezicima, mentalni leksikon