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Exploration of the relationship between word-association and learners' lexical development with a focus on American L1 and Croatian L2 speakers

Maja Séguin
Evangelical Theological Seminary
Croatia, Osijek

Abstract

Vocabulary acquisition is a dynamic process and there is a constant change in the way words are stored in the mental lexicon. Word association tests are used in linguistic research to observe to which extent mental mapping can be understood. This paper presents the results of a word association game consisting of seven words administered to second language speakers, and native speakers for comparative purposes. The results indicate the possibility of a link between experiences and associations, which leads to the recommendation for teachers to create activities and new experiences that demand the learner's personal involvement in expanding their vocabulary.

Key words: word association test; vocabulary; lexical development; mental and lexical connections; language acquisition.

1. Introduction

All human languages have a vocabulary (Kennison, 2014), items that "can stand on its own as a reply to a question or as a statement or exclamation" (Carter, 1998: 5). Without some knowledge of those items, neither conveying of meaning and discussing remote perceptions nor versatile levels of co-living would be possible. Lexical development is innate and strongly related to cognitive development (Vygotsky, 1978). These reasons are some of those making investigating the vocabulary acquisition processes worthy and the research presented in this paper was conducted to understand better the relationship between word-association and learner's lexical development. For the purpose of looking into mental and lexical connections, a word association game consisting of seven words was administered to second language (L2) speakers, as well as a group of native speakers for comparative purposes.

This paper starts with a literature review to understand the theory that applies to this research activity and continues with the methodology applied. A summary of the results are presented along with the analysis in Results and patterns, followed by some concluding words. Appendixes are added after the list of references to present the quiz/game used to collect responses (1), and a summary of results in the form of all associations that a word evoked (2).

2. Literature review

To understand properly the function of a word association test, it is important to understand first the theories about the organization of words in a mind. Therefore, this section gives a brief insight into the complexity of the mental lexicon and an explanation of the theories of the web-like system that organizes and links words stored in our mind. It also briefly presents a history of word association research, the assumptions that arose with word association tests, summaries of some studies, and shortcomings recognized.

2.1. *Words in the mind*

Steuer (1994) states that most researchers would agree that human language is unique and qualitatively distinguishable from the communication systems used by animal species. Out of various characteristics that set human language apart, it is worth mentioning that human language has the ability to express meaning symbolically about objects or events, near or far, and it can be used to create sentences that have never been heard before and yet understood by other listeners (Berko Gleason, 1993).

Researchers would also agree that children acquire words, and their meanings, at a very rapid rate. Aitchison (2012: 209) says that "on average a 2-year-old actively uses around 500 words, a 3 year-old over 1,000 and a 5-year-old up to 3,000", while "the passive vocabulary of a 6-year-old has been estimated at 14,000".

The native English-speaking adult has access to at least 50,000 words and possibly more. That number is likely to be considerably lower in the mind of an L2 speaker; nevertheless, there are vocabulary organization processes carried out by both. Those processes are looked at by investigating the knowledge and development of vocabulary. Knowing vocabulary involves knowing the meaning of words, idioms and phrases, but vocabulary competence, complex in nature, also requires an open door to that knowledge in order to use it effectively in context (Read, 2000: 16–17). As Widdowson (1989: 128) puts it: "The ability to use language may have to do with access which is relatively independent of the analytic

knowledge of grammar [...]." He continues to explain Chomsky's, Hymes', Bialystok and Sharwood-Smith's view on competence and ability, to conclude that communicative competence refers to knowing patterns, formulaic frameworks and knowing how to apply rules and make adjustments in different contexts (Widdowson, 1989: 135). Knowing words, then, being the essential part of the communicative competence needs to be explored in the relationship between systematizing lexical structure of a language, i.e. lexical semantics, and the process of words being handled by the human mind, i.e. mental lexicon (Aitchison & Lewis, 1995).

2.2. *Mental network building*

Communication is deterministic to a certain extent. Utterances and topics arrive based on what was said before, and the vocabulary we have to work with is preferential and dependent on a social context.

Carter (1998: 19) states "words do not exist in isolation: their meanings are defined through the sense relations they have with other words." Additionally, he suggests that there exists the network of meanings between senses and subsenses of basic units of vocabulary in a language (p. 23), and besides referential meaning and structural semantic sense relations, associative and stylistic meanings have to be also taken into account (p. 29). Pure definitions of words might not convey the full meaning and possible connections that the word would imply. However, at the same time, languages cannot have a different lexical item for every distinction and sometimes the same label or symbol is used for more than one meaning. This implies that words can be polysemous, i.e. several meanings may be represented in the same word and it may be expressed in different forms. "The meanings of particular elements of a given language, the phonological and orthographic forms of these elements, and the specific ways in which they collocate and colligate" is considered part of the mental lexicon (Singleton, 1999: 15). Aitchison (2012: 248) argues that mental lexicon deals with links primarily and with cores of words rather than peripheries, frameworks instead of details, explaining, "lexical connections in the mind are far from what we normally imagine a dictionary or lexicon to be." Read suggests that mental lexicon consists of sets of words and there is a developing ability to differentiate between semantically related words and the knowledge of how individual words relate to each other (Read, 2004: 219). Sökmen (1997: 241) agrees to the lexico-semantic theory where as more words are learned, the mind must create a system to organize them, which takes the form of a web and that such a system of inter-connected links allows words to be recalled more readily. She brings this to a practical recommendation for second language teachers in that they should help their students create these links by building on their own experiences and knowledge, which will reinforce links between words

and ease the process of learning.

2.3. *Structural organization of the mental network*

Aitchison (2012: 12) observed that the mental system of word organization is not only based on spelling and sounds, but on the meaning as well. Research shows frequent confusion with words of similar meaning as well as that in responses to selected words "the average" people "almost always select items from the semantic 'field' of the original word... pick the partner if the item is one of a pair... [and] respond with a word from the same word class" (Aitchison, 2012: 100). Although researchers argued for significant differences between the L2's word-web organization and that of the L1's (Swan, 1997: 174), some other research suggested the possibility of structural similarity between the two mental lexicons (Wolter, 2001).

2.4. *Semantic, phonological relations and world knowledge*

In researching the organization of the mental lexicons, researchers have focused on different types of responses. Semantically the responses have been observed as a part of two major categories, paradigmatic and syntagmatic (Meara, 1980: 234). Former ones belong to the same word class, while the latter are usually from a different word class than the prompt word. Paradigmatic responses include coordinates, superordinates, subordinates and synonyms, while syntagmatic responses include collocations (Wolter, 2001: 43). When familiar prompt word used, adult native speakers tend to produce more paradigmatic responses, while infrequent words are likely to provoke syntagmatic responses. Children provide many syntagmatic instead of paradigmatic associations, as well as responses that resemble phonologically without a semantic relation to the prompt word (Meara, 1980). Apart from grammatical and lexical aspect, responses can also project certain world knowledge reflecting individual views and values (Schmitt 1997: 212).

2.5. *Word association*

The word association test comes from the work of psychologists - it is commonly attributed as being invented by Sir Francis Galton (1879) in the late 19th century when he used word lists to explore subconscious thought processes. Levelt (2013) summarizes the history of the word association test starting with Galton, including Sommer as well as Kent and Rosanoff who made standardized lists of words for

use in clinical testing. Further, Levelt notes (p.433) that it was not until Erwin Esper's study in 1933 that the experiments were used to investigate language learning. Since then, a number of researches have been done by analyzing the responses given in word association tests in order to gain an insight in the development and organization of the mental lexicon – some examples being Sökmen, 1993; Greidanus and Nienhuis, 2001; Meara, 2009.

2.5.1. *Prior research using word association tests*

Fitzpatrick (2007: 320) points that prior research has been unable to agree how association patterns should be interpreted and classified. Studies based on word association tests in English brought several assumptions that Fitzpatrick identifies: (1) adult native speakers respond to association tests in a predictable, homogeneous fashion; (2) patterns of association in the L2 differ in a systematic way from those in the L1; and that (3) the response is determined by the respondent's membership in a particular category. In tackling these assumptions, Fitzpatrick concludes that although adult native speakers are not homogeneous in their response behavior as a group (p. 326), individual native speakers are predictable in their responses, but that behavior cannot surely be drawn to a particular category or whether they are operating in the L1 or L2 (p. 327). Meara (2009: 1) points out that it was difficult to distinguish what made L2 responses different from L1, and although it was easy to list the responses, it was still difficult to make claims about the way L2 vocabulary grows, because of a general lack of a theoretical framework.

Further, in analyzing L2 word association responses Meara faced methodological difficulties, which included classifying responses and the choice of stimulus words (p. 2). His framework classified respondents' responses as syntagmatic, paradigmatic and clang, which was found imprecise and not suitable for the L2 context. Greidanus and Nienhuis (2001) in their study built on Read's three types of association, which they summarize (p. 569) as paradigmatic, syntagmatic but also analytic type of associations which incorporates the element of the meaning of the stimulus word used in their dictionary definition. Sökmen (1993) in her research analyzed the responses by word class categories (supra/subordinate classifications, synonyms, coordinates, contrasts, collocations, including additional classes - nonsense, word forms and affective category), part of speech (noun, adjective or verb) and most popular responses.

Sökmen (1993: 136) notes that previous research by Aitchison (1987) shows that coordinates, including contrasts are closely associated and have long-lasting links in native speakers of English, just as they respond with words in the same semantic field and word class. Summarizing the work of other researchers (p. 136-7), Sökmen mentions the studies (Browman, 1978) that nouns and verbs more

frequently than adjectives connect with their own part of speech; (Deese, 1965) that nouns more frequently than verbs and adjectives elicit their own part of speech; (Meara, 1978) that beginners have fewer primary responses and (Soudek, 1981) that advanced students have more synonyms and contrast words. However, these studies are approached by Sökmen cautiously because of the choice of words selected and the lack of overall strategy. Also, as observed by Aitchison (1987), these association tests do not reflect natural speech and single word responses cannot say much about the mental links, and additionally Coleman (1964) points out that results may be influenced by the surrounding (Sökmen, 1993: 137).

The preceding literature demonstrates that extensive research of the organization of the mental lexicon, and the usage of word association tests in order to gain an insight into it, has been carried out. Little research has been conducted (published) regarding the application of such a test in a Croatian ESL learning context.

2.5.2. *Pedagogical implications*

Word association tests remain an important and frequently used tool for exploring the construction of the lexical mental network. Seemingly, no one contests that some information about the strongest types of associations are revealed for a learner's current knowledge. This is true even if respondents may know the meaning of the trigger words, but they might not have the knowledge of functional aspects of lexical items. Keeping the challenges in mind, results can still help language researchers understand factors influencing the learning of vocabulary, and make practical suggestions for language teachers.

3. Methodology

This section gives an overview of the word association test administered to 49 participants, composed of seven words of various word classes as proposed by McCarthy (1990: 152). The task of this research was to investigate how word-association influenced the lexical development of L2 speakers.

3.1. Participants

Participants of different age levels were tested for their knowledge of a small sample of words. L2 speakers numbered 22, while native English speakers numbered 27.

L2 speakers consisted of Croatian (18), Bosnian (1), Macedonian (1), Serbian (1),

and Ukrainian (1). Speakers included volunteers from the student body and members of the administration at a school of higher education in Croatia, who had different levels of proficiency in an attempt to relate it to responses. The L2 Non-Croatians were selected as having been living in Croatia for an extended period. The respondents were in the age range of 12 to over 50, while over half were older than 30.

Per their self-evaluation, more than 70% (16) considered themselves as intermediate in their knowledge of English, while less than 10% (2) were beginners and 18% (4) were advanced. Although the level indicated was from their self-evaluation, and not the result of a formal examination, participants' levels were reviewed based on pre-existing familiarity to be fitting with the Common European Framework. More precisely, the intermediate group of participants can speak and understand well, but have problems with more complex vocabulary (B1/2); participants who claimed themselves to be beginners can actually communicate simply and understand in familiar situations (A2); and the advanced speakers can speak and understand very well but sometimes have problems with unfamiliar situations and vocabulary (C1/2).

The native speakers, included as a control group for comparative purposes, involved people of various cultural backgrounds and ages who are currently or were previously connected with the same school of higher education as the selected L2 speakers.

3.2 Selection of words

Seven words were used in this study. The words used are not found on the conventional Kent-Rosanoff list, but some of them still possibly elicit predictable responses and also demonstrate similarity between native and L2 associative patterns. These were the words: *mother, library, money, the, play, curiosity* and *colorful*. The reasoning behind this list includes: the usage of a human noun which is also in subordinate classification (*mother*), a place noun (*library*), an inanimate concrete noun which can also reflect on cultural aspect (*money*), an abstract and less frequently used noun (*curiosity*), an adjective (*colorful*) and a grammar/function word (*the*). An additional reason for choosing the last word (*the*) is that it does not exist in Slavic languages and yet is the most used word in the English language based on the data from the Cambridge International Corpus (Carter: 99) and the British National Corpus.

3.3 Collecting responses

Participants were asked to participate in the association game, described as a survey type of an activity, in which they were to write only one word that comes to their mind as soon as they read the words provided. L2 speakers were handed the sheet and they filled it with their associations in two minutes. A time limit of two minutes was given not to allow overthinking about the words and to encourage eliciting the first response that comes to mind. Non-native and some native participants were approached individually either in a classroom or office setting, while most native speakers were contacted by e-mail. In all cases, the associations, which participants provided, reflect individual rather than group responses. Participants approached in person received a verbal description of the exercise and of the follow-up questions. In all cases, no verbal communication took place while collecting the actual word associations.

4. Results and patterns

After the survey results were collected, analysis was executed in three steps. First, the responses were analyzed and grouped into categories and counted. Second, the categorized data, more specifically the numbers found, were used for analysis to detect trends. Finally, the aspect of cultural bias was examined to see if culture, separate from the language skill, was a factor of bias.

4.1. *Analyzing the words*

The responses given were put into one of seven categories representing the type of word association: Coordinates, Collocations, Supra/sub-ordinate, Synonyms, Contrasts, Nonsense, Phonologic, World knowledge. The category 'nonsense' was adopted from Sökmen's study for the responses where the relation to the trigger word was difficult to define.

During the analysis, 'coordinates' were considered to be words of the same level within a certain category (e.g. *mother – father*) and supra- and subordinate were word pairs where one represents a class to which the other can belong (e. g. *money – dollar*). The category 'collocations' was used for words often found close to one another, with the additional criteria that the trigger word provided in the quiz must normally occur in a sentence before the word provided by the respondent, that is, the left to right principle as used by Sökmen (1993). While the category 'synonyms' was used for words carrying a similar meaning, 'contrasts' were words with an opposite meaning (e.g. *colorful – plain*). 'Nonsense' was used to categorize words where no association could be determined (e. g. *play – bill*). The

category 'phonologic' was used to categorize the respondent's words (in part or in whole) which sounded like the word provided (e. g. *money – honey*). Finally, 'world knowledge' was used to categorize responses representing an experience, an emotion invoked, utility or in general, an association based on general knowledge.

The responses, or more precisely – the categories they belong to, were associated with the skill level of the user, including whether English was the first language of the respondent or not, as well as being associated with the trigger word provided.

4.2. *Analyzing the numbers*

With the responses categorized, counts were used to obtain percentages and to look for patterns, which are examined in the following sections. First, the overall occurrence of certain associations by skill level was examined regardless of the individual word. Second, the occurrence of certain associations by word, by type of respondent (L1 or L2) was considered.

4.2.1. *Evaluation – overall occurrence of types of associations*

In this first evaluation, the percentage of words provided by the respondents belonging to each category described above was compared considering their level of knowledge of English (Beginner, Intermediate and Advanced for L2 speakers, Native for L1 speakers). The results of this evaluation can be seen in Figure 1.

The percentages show that collocations and world knowledge are most frequently used to provide an answer and together count for at least 70% of the answers within a certain skill level (for the advanced) and up to 100% (in the case of the beginners). Another observation is that while all other types are less frequently used, contrasts are almost never used (only one such word association was observed).

What is also observed is that the few phonological similarities in association responses are found only in non-native respondents, echoing Meara's observation (Carter, 1998: 199) that learners have a tendency to produce clang association like young children.

Looking deeper at the collocations and world knowledge categories, the frequency of collocations increases in proportion to the level of the speaker. Similarly, the use of world knowledge decreases with the exception that the native users of English use slightly more world-knowledge than advanced L2 speakers.

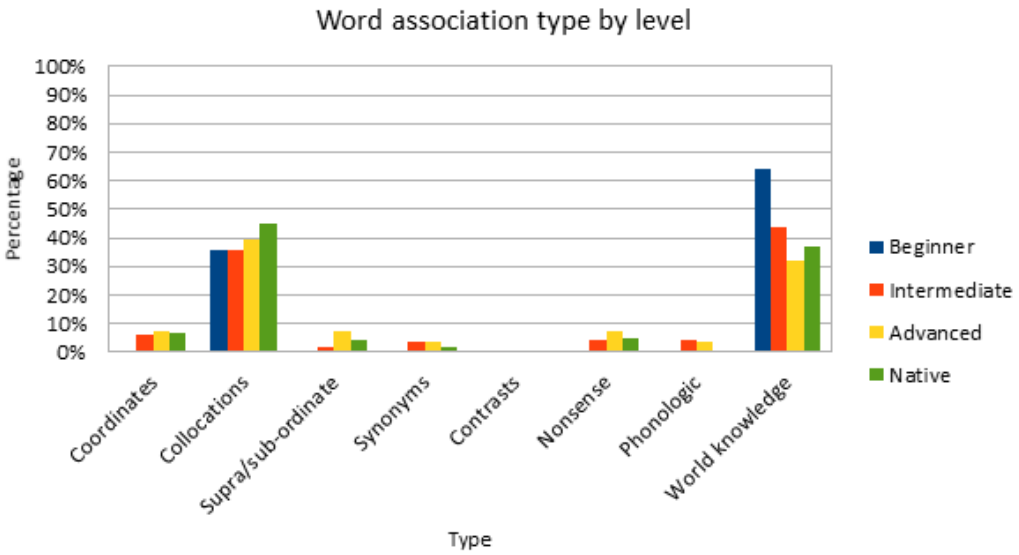

Figure 1. Word association type by level of knowledge.

4.2.2. Evaluation – associations by word

The next analysis made was the frequency of certain associations for each word, considering the percentage of responses per category for L1 users separate from L2 users, which is visualized in figures 2 and 3. For the purpose of this analysis, all L2 users were considered regardless of their skill level.

The trigger word *mother* led primarily to responses categorized as world knowledge, although L1 users gave also more answers that were coordinates.

The word *library* elicited primarily a single response from both L1 and L2 – book (singular or plural) which was considered as a collocation. While this was almost exclusively the type of response provided by L1, L2 participants also provided other responses categorized as world knowledge based on either actions that can take place in a library (read, research), emotions evoked (boring) or a perceived result of the usage of libraries (wisdom). Seemingly, the collocation (library book) is so strong and frequent in native speakers evoking more pre-programmed responses than for foreign speakers.

The word *money* elicited primarily responses considered to be world knowledge associations as many of the responses given could be considered to represent what money can be used for (shopping, spend, problem solving, etc.)

without any significant difference as to the primary type of association made by L1 and L2 users.

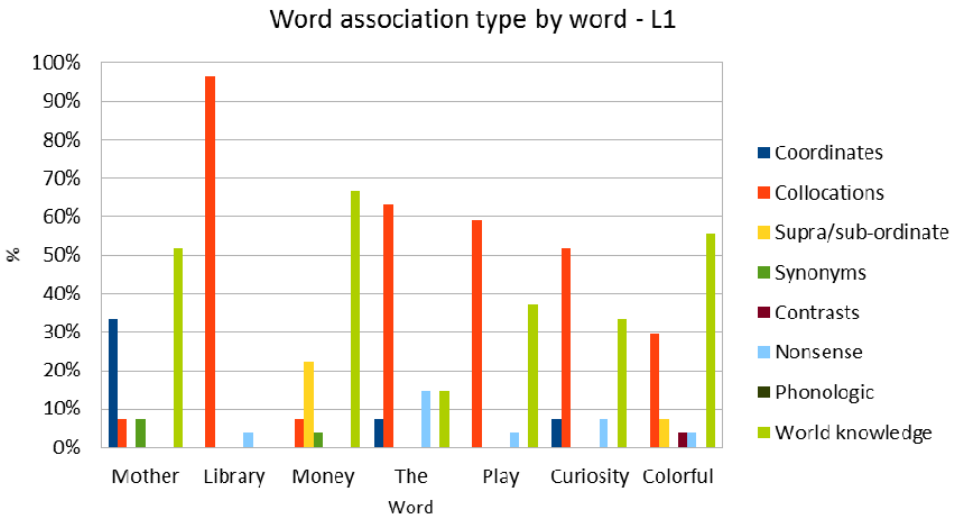

Figure 2. Word association by trigger word (L1 participants).

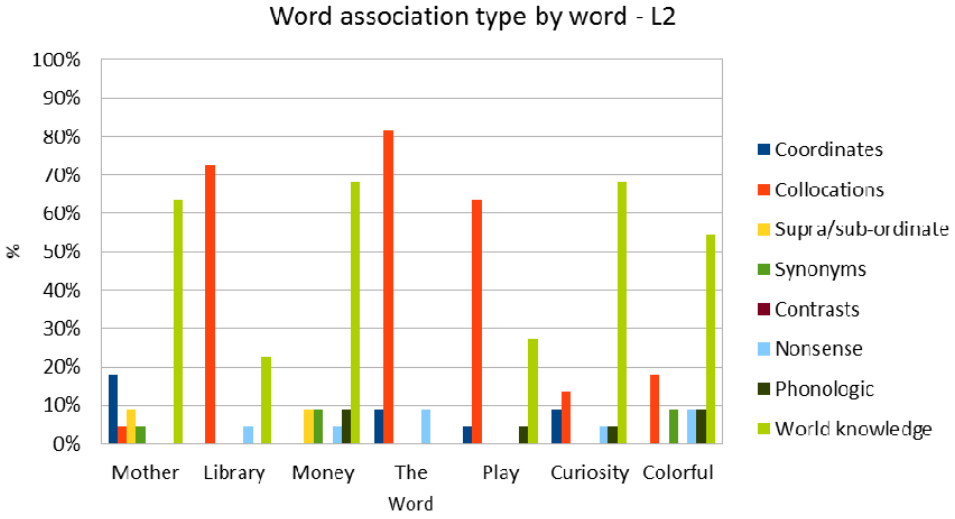

Figure 3. Word association by trigger word (L2 participants).

The word *the,* as the most frequent word in the English language without any direct equivalent in the Croatian language, led to many collocations from both categories of participants (*the end* as the most popular of all). L1 users gave more answers based on a different association than L2 and were the only ones to provide answers considered as world knowledge by stating the fact that the word '*the*' is an article.

The word *play*, based on the responses given was considered by the respondents as a verb primarily and as a noun only infrequently. Considering the responses *act*, *stage* and *theater* as indicative of word being considered a noun, only three respondents answered this way indicating that the influence of the difference in understanding to the results is minor.

The word *curiosity*, of all the trigger words, is the only one that generally elicits different types of answers (associations) from L1 users than L2. For this low-frequency word, L1 users provide most frequently a collocation while L2 users answer based on world knowledge.

The word *colorful*, as most other trigger words, also has the same primary type of association visible in L1 and L2 users.

4.3. *Analyzing cultural bias in the results*

The words *money* and *curiosity* show a certain cultural bias worth mentioning and exploring to understand if the nationality of the respondents potentially influenced the results.

With the word *money*, a particular pattern appears from the most frequent responses (six responses being *dollar* or *dollars* and four responses being *green*). They are exclusively given by L1 users and could be considered as a cultural reference as many of the L1 respondents were American nationals. Croatian money would not be referred to as dollars and none of the common Croatian paper denominations are green. This aspect of cultural bias does not significantly change the overall distribution where world knowledge is the primary type of association.

A possible explanation for the major difference in the results for the word *curiosity* is possibly cultural due to the expression *curiosity killed the cat* being generally well known in English speaking cultures yet less likely to be known by an L2. Littlemore (2001: 466) considers the importance of training for L2 users in metaphorical language, as foreign language students "do not have immediate access to this information" and refers to Bachman's (1990) statement that the understanding of metaphors is "deeply rooted in the culture of a given society or speech community." Still, it is also possible that words that are less common will produce different associations in L2 users than those made by L1 speakers

(Greidanus & Nienhuis, 2001).

Although cultural bias can be observed in the responses to these words, it does not seem to influence significantly the overall results and such a bias was not observed in other responses. Therefore, the differences in the answers and lack of a major difference between L1 and L2 users and the type of association made is considered to only be due to their status as native or non-native speaker.

5. Conclusion

Word association tests are used in linguistic research to observe to which extent the mental mapping can be understood. Both Aitchison (2012) and Fitzpatrick (2007) find the results of such studies to be unreliable especially because results elicit only one word, which is not a product of natural speech process and which also brings interpretative issues. Knowledge of words involves various aspects and words themselves used in such tests can be rather polysemic, so defining lexical development through this simplistic and conditioned mapping can cause misinterpretations. As the lexical knowledge constantly increases, certain semantic structuring and reconstructing takes place, but these association tests give an insight into a "static, decontextualized version of a lexicon" (Carter, 1998: 202).

It seems that any conclusive pattern of predictability or homogeneity of responses turned out to be an assumption that linguists have already started challenging and are investigating further. Based on a limited number of subjects tested here and the words used, it is also difficult to draw conclusive patterns. Only small statistical differences can be noticed from these results as to the types of responses provided by L2, depending on their level of experience, and those of L1.

Nevertheless, researchers know that vocabulary acquisition is a dynamic process and that there is a constant change in the way words are stored in the mental lexicon. Results shown in this study indicate the possibility of a link between experiences and associations. Phonological similarities, being rare, would not seem to be playing an important role. In addition, the rare usage of synonymy as opposed to the frequent usage of collocations can lead us into thinking that learning definitions may not be as efficient as using descriptive imagery that could help students memorize and retrieve vocabulary. This leads to the re-commendation for teachers to create activities and new experiences that demand a learner's personal involvement in expanding their vocabulary.

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Author's address:

Maja Séguin
Cvjetkova 32
HR-31000 Osijek
Croatia
E-mail: Maja.Seguin@evtos.hr
MXS1075@student.bham.ac.uk

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Appendix 1

Word Association Game

A) Below you will find seven random words listed. The goal of the game is to write down one word that comes to your mind as soon as you read the word listed.

1. MOTHER _____
2. LIBRARY _____
3. MONEY _____
4. THE _____
5. PLAY _____
6. CURIOSITY _____
7. COLORFUL _____

B) What is your first language?

_____

C) How do you rate your knowledge of English? (Circle one)

Beginner
Intermediate
Advanced

D) How long have you been studying English?

_____

E) What is your age group? (Circle one)

below 13
14 – 19
20 – 25
26 – 30
31 – 40
41 – 50
Above 50

_____

_____

Appendix 2

Word associations by trigger word

Word associations for *colorful*		
Response	**Count**	**Association type**
act	1	Nonsense
art	1	Collocations
attractive	1	World knowledge
beauty	1	World knowledge
blue	1	Supra/sub-ordinate
character	1	Collocations
clothes	1	Collocations
colors	1	Synonyms
end	1	Nonsense
fall	1	World knowledge
flower	1	World knowledge
gay	1	World knowledge
happy	2	World knowledge
hawaii	1	Nonsense
kaleidoscope	1	Collocations
life	4	Collocations
multicolored	1	Synonyms
nature	1	World knowledge
nice	1	World knowledge
painful	1	Phonologic
paint	1	Collocations
painting	1	Collocations
picture	1	Collocations
plain	1	Contrasts
playful	1	Phonologic
plentiful	1	Phonologic
purple	1	Supra/sub-ordinate
rainbow	18	World knowledge
vibrant	1	World knowledge
yarn	1	Collocations

Word associations for *curiosity*		
Response	**Count**	**Association type**
adventure	1	World knowledge
answers	1	World knowledge
cat	15	Collocations
child	1	World knowledge
child-like	1	World knowledge
children	3	World knowledge
courage	1	Coordinates
cure	1	Phonologic
daughter	1	World knowledge
eager to know new things	1	Nonsense
exploring	1	World knowledge
feeling	1	World knowledge
filled	1	Nonsense
fun	1	World knowledge
George	1	World knowledge
instinct	1	World knowledge
intelligence	1	Coordinates
interesting	3	World knowledge
invention	1	Nonsense
killed (as in the cat)	1	Collocations
kills	1	Collocations
knowledge	2	Coordinates
mind	1	World knowledge
news	1	World knowledge
nosy	1	World knowledge
person	1	World knowledge
questions	1	World knowledge
something new	1	World knowledge
travel	1	World knowledge
trouble	2	World knowledge
what?	1	Nonsense

Word associations for *library*		
Response	**Count**	**Association type**
book	13	Collocations
books	27	Collocations
boring	1	World knowledge
card	3	Collocations
free	1	World knowledge
read	1	World knowledge
research	1	World knowledge
sanctuary	1	Nonsense
wisdom	2	World knowledge
work	1	Nonsense

Word associations for *money*		
Response	**Count**	**Association type**
100	1	Nonsense
bag	1	World knowledge
bank	3	World knowledge
cars	1	World knowledge
cash	2	Synonyms
clothes	1	World knowledge
coin	1	Supra/sub-ordinate
comfort	1	World knowledge
cost	1	World knowledge
dollar	3	Supra/sub-ordinate
dollars	3	Supra/sub-ordinate
earn	1	World knowledge
euro	1	Supra/sub-ordinate
exchange	1	Collocations
food	1	World knowledge
Geld (German)	1	World knowledge
good	1	World knowledge
green	4	World knowledge
helpful	1	World knowledge
honey	2	Phonologic
joy	1	World knowledge
none	1	World knowledge
opportunity	1	World knowledge
paper	1	World knowledge
plenty	1	World knowledge
poverty	1	World knowledge
power	1	World knowledge
problem solving	1	World knowledge
prosperity	1	Synonyms
rich	1	World knowledge
savings	1	World knowledge
shopping	2	World knowledge
spend	2	World knowledge
stability	1	World knowledge
struggle	1	World knowledge
transfer	1	Collocations
wealth	1	Synonyms
work	1	World knowledge

Word associations for *mother*		
Response	**Count**	**Association type**
baby	2	Coordinates
beautiful	1	World knowledge
brother	1	Coordinates
busy	1	World knowledge
care	1	World knowledge
cares	1	World knowledge
caring	2	World knowledge
daughter	1	Coordinates
dearest	1	World knowledge
family	1	Supra/sub-ordinate
father	8	Coordinates
food	1	World knowledge
goose	1	Collocations
grandmother	1	Coordinates
hen (mother...)	1	Collocations
hero	1	World knowledge
home	2	World knowledge
hug	1	World knowledge
in law	1	Collocations
Linda	1	World knowledge
love	12	World knowledge
Mom	2	Synonyms
Mommy	1	Synonyms
nice	1	World knowledge
nurturer	1	World knowledge
nurturing	1	World knowledge
pain	1	World knowledge
smile	1	World knowledge
woman	1	Supra/sub-ordinate

Word associations for *play*		
Response	**Count**	**Association type**
a game	1	Collocations
a role	1	Collocations
act	1	World knowledge
ball	6	Collocations
bill	1	Nonsense
child	1	World knowledge
children	3	World knowledge
dance	1	World knowledge
dress-up	1	Collocations
FFWD (fast forward)	1	Coordinates
fun	5	World knowledge
game	8	Collocations
games	6	Collocations
ground	2	Collocations
guitar	1	Collocations
happiness	1	World knowledge
house	1	Collocations
joy	1	World knowledge
kids	1	World knowledge
Monopoly	1	Collocations
reduce tension	1	World knowledge
soccer	1	Collocations
sport	1	Collocations
stage	1	World knowledge
stay	1	Phonologic
theater	1	World knowledge
yes	1	Nonsense