

**THE UNIVERSITY OF BIRMINGHAM**

**Centre for English Language Studies**

**MA TEFL/TESL**

**Module 3 Assignment**

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**The Relationship between Word-Association and Learners'  
Lexical Development**

**LX/06/02**

Follow task 123 outlined on page 152 of McCarthy (1990 *Vocabulary* OUP). You do not have to use students: anyone who has an L2 but has not been brought up as a bilingual will do. Use at least four subjects and test them on their L2 (or L3/ L4 etc.). Report your findings, giving the level(s) of subjects' L2 (L3, etc.) and including the prompt words and responses. Follow McCarthy's list of evaluation points, adding other points to this if you wish.

## 1. Introduction

“I wanted to utter a word, but that word I cannot remember; and the bodiless thought will now return to the palace of shadows”

*(Mandelstam, quoted by Aitchison, 2003: 3)*

In her seminal text introducing the mental lexicon, Jean Aitchison makes use of the above words of the Russian poet Osip Mandelstam to highlight the importance of words and how lost we would be without them (Aitchison, 2003: 3). Such a scenario is particularly common when attempting to communicate in a language other than one’s native tongue. While the native speaker will often be able to locate an alternative in their lexicon, or at least be able to describe the desired word in enough detail as to allow their discourse partner to comprehend their thoughts (perhaps even supply the elusive word for them), the non-native speaker is all too often forced to articulate their thoughts in words which dilute the meaning considerably, or to give-up entirely, allowing their thoughts to indeed remain ‘bodiless’ (in the L2, at least) and ‘return to the palace of shadows’.

Inevitably, this leads to frustration, and can only have a negative effect on the learner’s willingness to communicate as fully as possible. Intelligent individuals rarely enjoy having their articulate thoughts rendered foolish on account of being let-down by their second language abilities. Thus, any way of assisting L2 learners of English in their quest to build a powerful, readily-accessible lexicon would be of great benefit to us as language teachers.

This paper aims to explore the learner’s lexical development. It will begin by attempting to satisfactorily define the terms lexicon and lexical development with regard to L2 learning. A brief summary of the major research on the topic will follow, before embarking on some small-scale research in the form of a word association test outlined by McCarthy (1990: 152. See

Appendix A). The results of this research will be analysed, evaluated and any emerging patterns will be identified and discussed. Particular attention will be devoted to answering the 3 questions McCarthy poses:

- 1) Does such a word-association test tell you anything about how your learners are making mental links between words they have learnt?
- 2) At lower levels, are phonological similarities playing an important role?
- 3) Do the results bear out the characteristic types of response discussed in 3.2?

*(McCarthy, 1990: 152)*

These ‘characteristic types of response discussed in 3.2’ include coordination, collocation, superordination, synonymy, as well as phonological, orthographic and encyclopaedic responses (McCarthy, 1990: 35-45).

## **2. Defining the Lexicon**

Given that few would disagree that ‘meanings of words’ is at the heart of any definition of *lexicon*, it seems only pertinent to examine what exactly is meant by the term *lexical development*.

A quick glance at several dictionaries reveals their principal definitions of *lexicon* to be along the lines of:

“lexicon (n): all the words and phrases used in a particular language or subject”

*(Oxford Advanced Learners’ Dictionary 2002, Digital Edition)*

“lexicon (n): a dictionary, esp one of an ancient language such as Greek or Hebrew”

*(Collins English Dictionary 2007, Online Edition)*

But it is the fourth definition listed by Richards and Schmidt which is most relevant to this discussion. This describes *lexicon* as ‘a mental system which contains all the information a person knows about words’. It expands on this, listing what psycholinguists consider a person’s knowledge of a word to include:

- a) knowing how a word is pronounced
- b) the grammatical patterns with which a word is used
- c) the meaning or meanings of the word

*(Richards and Schmidt: 2002, 308)*

Nation (1990: 31) has an even more comprehensive list of the types of knowledge which a person requires in order to truly know a word:

- 1) spoken form of the word
- 2) written form of the word
- 3) grammatical behaviour of the word
- 4) collocational behaviour of the word
- 5) frequency of the word
- 6) stylistic register constraints of the word
- 7) conceptual meaning of the word
- 8) associations the word has with other related words

This notion of the lexicon as a mental system, *the mental lexicon* (to use the term adopted by Aitchison, McCarthy among others), is highly complex. In order to help us grasp its complexity, McCarthy offers us a range of metaphors, all of which he believes “may prove useful in part”: a dictionary; a thesaurus; an encyclopaedia; a library; a computer (McCarthy, 1990: 34). But what exactly do we know about the mental lexicon? McCarthy draws our

attention to the fact that all of the given metaphors share the ideas of input, storage and retrieval, and there is general consensus in the literature that “the mind must organise words in some way” (McCarthy, 1990: 34). The question of how the mind organises words is the central theme of this paper.

But the literature also concurs that there is a lack of knowledge on the subject (Aitchison, 2003; Carter, 1998; McCarthy, 1990), and that studies into L2 mental lexicons are particularly scarce (the Birkbeck Vocabulary Project of the early 1980s being one of the few). While research on young L1 speakers has been applied to second language research (Schmitt, 2000: 41), Channell (1988) cautions us against making any assumptions that “the mind organizes the lexicon of a second language in the same way as it does its first” or “that the processes of comprehension and production necessarily operate on the same mental bases” (Channell in McCarthy, 1990: 34).

So where do we begin? Aitchison (2003: 16-17) draws a very vivid analogy between the investigations of the famous fictional detective Sherlock Holmes and research into the mental lexicon. Resources are limited, and we must make use of various isolated clues as we strive to understand the workings of the mind. This paper is based upon a psycholinguistic investigation – the basic word association experiment.

### **3. Word Association Tests**

The first recorded experiment on the organisation of words in the mind dates back to the work of the British psychologist Francis Galton in the late nineteenth century (Aitchison, 2003: 23-24). Galton’s only subject in 1879 was himself, but other psychologists quickly expanded the

use of word association, and 500 subjects were studied in an 1889 experiment by Cattell and Bryant (Schmitt, 2000: 18). Work continued throughout the twentieth century, and it became apparent that there was indeed a great deal of conformity in responses, leading to the widely-used expression ‘norms of word association’ (Aitchison, 2003: 24). Of course, given the infinite number of variables in human minds, results are never even close to total uniformity, but there is clearly evidence to show that responses are not random. There are similarities in how humans organise their mental lexicons. Schmitt’s summary of various studies finds that the top 3 responses generally make up over 50% of the total, and the primary response alone accounts for 30-40% (Schmitt, 2000: 38-39). Aitchison (2003: 85) goes further, citing some primary responses at over 75% (e.g. ‘king’ - ‘queen’, ‘boy’ - ‘girl’), concluding that we may be able to obtain a “reasonably reliable ‘map’ of the average person’s ‘word-web’”. Aitchison’s notion of word-webs is a topic which we will return to later in this paper.

### **3.1 Analysing Associations**

There are three main categories of word associations, as defined in the literature: clang associations, syntagmatic associations and paradigmatic associations.

#### **3.1.1 Clang Associations**

Such responses are “similar in form to the stimulus word” (Schmitt, 2000: 39) and phonologically related. These have no semantic resemblance, and are rarely seen in the responses of adult native speakers.

Example: monkey – MONEY

### 3.1.2 Syntagmatic Associations

These are responses which have a sequential or chain relationship (Carter, 1998: 198; Schmitt, 2000: 39) and tend to have different word classes. Collocational links are syntagmatic. They include multi-word items such as idioms, but are not necessarily adjacent. Collocations vary in strength, and for the purpose of this paper, we shall refer to *strong* and *weak* collocational links.

Examples: CHEEKY monkey (adj – noun)

monkey AROUND (verb – adverb)

WILD monkey (adj – noun)

SWING like a monkey (verb – noun)

### 3.1.3 Paradigmatic Associations

Responses coming from the same grammatical class as the stimulus word are referred to as paradigmatic. They may or may not be alternative words providing the same or similar meaning.

Examples: monkey – ANIMAL

monkey – PRIMATE

monkey – CHIMPANZEE

monkey – ELEPHANT

monkey (inf) – IMP, TERROR

Paradigmatic responses can be further categorised according to the semantic relation between the stimulus and the response. Aitchison (2003: 86) lists coordination as the most common link.

After collocation (syntagmatic), she lists superordination and synonymy. McCarthy (1990: 16)

highlights synonymy, antonymy and hyponymy. I have chosen to follow Schmitt's definitions of sense relations. Table 1 is reproduced from Schmitt:

**Table 1: Sense Relations**

Sense Relation	Word	Attribute	Examples
synonymy	synonym	similarity	huge – gigantic rich – wealthy
ungraded antonymy	ungraded antonym	exclusive oppositeness	alive – dead pass – fail
graded antonymy	graded antonym	oppositeness on a continuum	big – little hot – cold
hyponymy	hyponym		
	superordinate (hyperonym)	more general category	<u>vehicle</u> – car <u>fruit</u> – apple
	coordinate	same level of generality	<u>car</u> – <u>truck</u> <u>apple</u> – <u>orange</u>
meronymy	subordinate		car – <u>Ford</u> apple – <u>Crab Apple</u>
	meronym	more specific category	bicycle – wheels, handle, seat
		whole – part	

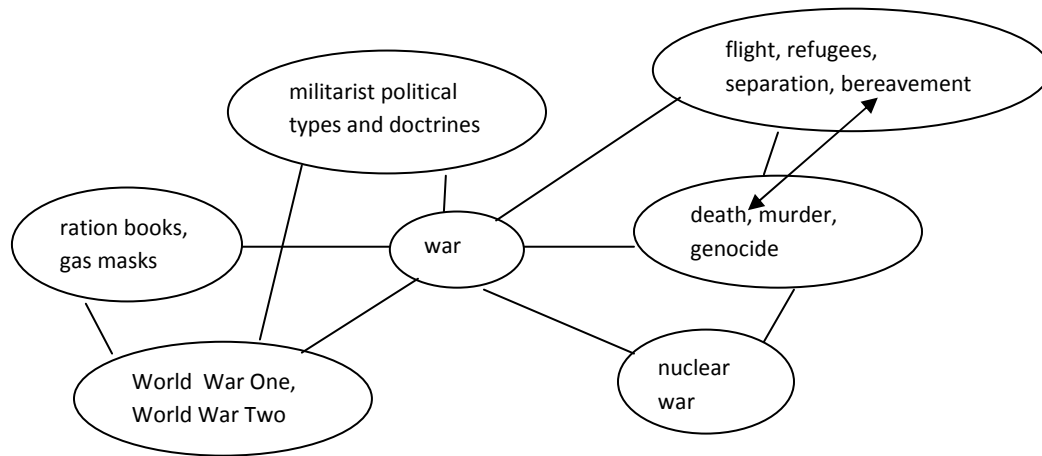
*(Reproduced from Schmitt, 2000: 26)*

### 3.1.4 Encyclopaedic Responses

In addition to the above categories, I include 1 more: encyclopaedic responses. McCarthy (1990:41) defines encyclopaedic knowledge as that which “relates words to the world”. It involves all our previous memories and experiences of a word, and will thus vary greatly from person to person. Echoing an analogy used by Aitchison, McCarthy refers to *webs* as he seeks to



highlight the complexity of these word associations. He uses his knowledge of the word ‘war’ as an example (Figure 1), and these associations are clearly the results of more than semantic or collocational links:



*(Reproduced from McCarthy, 1990: 41)*

**Figure 1**

#### **4. Findings from Previous Studies**

As mentioned above, there has been a lack of research to date, dealing specifically with second language acquisition. However, Meara (in Schmitt, 2000: 41 and Carter, 1998: 199) made the following observations:

1. L2 learners have less regular responses than native speakers, and responses are often not the same as those chosen by native speakers. Meara (1982: 30) comments that the greater variety of responses from L2 learners is an odd finding, given that they must have a smaller, more limited vocabulary. He attributes this to the L2 learners' tendency to produce clang responses, as well as the organisation of the L2 learners' mental lexicon being less advanced than that of native speakers.

2. L2 learners often misunderstand the stimulus word, leading to completely unrelated associations. But these ‘maverick responses... cannot be dismissed out of hand’ (Meara, 1982: 30) as the frequency with which they arise highlights the problems L2 learners have in even identifying words which are relatively simple, and the learners themselves claim to know.
3. L2 learners, like L1 children, tend to produce more syntagmatic responses, while native-speaking adults produce more paradigmatic responses.
4. L2 learners’ responses are more unstable, but they become more similar to those of native speakers as proficiency increases. This leads to the suggestion that ‘the associations of L2 learners, like other elements of word knowledge, evolve in an incremental fashion’ (Schmitt, 2000: 40).

In her analysis of previous experiments, Aitchison (2003: 85) identified 3 more specific findings:

1. Subjects generally select a response from the semantic field of the stimulus word.
2. Subjects generally select the obvious partner of the stimulus word if one exists. This may be the second word of the pair, or it may be an antonym.
3. Adult native speakers are likely to respond with a word of the same word class – i.e. a noun elicits a noun, adjective elicits an adjective etc.

We should again stress that Aitchison’s findings are in reference to native speakers of English, and not L2 learners.

#### **4.1 Pre-experimental hypotheses**

Given the conclusions gathered from the work which has been done to date, we can make some tentative assumptions about what the results of the following word association test

will show. We may expect to see a higher incidence of syntagmatic responses in lower level learners, and conversely, a higher incidence of paradigmatic responses in more proficient subjects. Clang associations and unrelated associations resulting from miscomprehension should be far more prevalent in lower-level learners. Advanced subjects' responses should show a high number of words which are of the same word class as the stimulus word.

## **5. The Word Association Test**

### **5.1 Selecting a Title**

Prior experiences of conducting extremely rudimentary word association tests with Japanese students had led to a concern that 'accurate' results would be difficult to obtain given the particularly high levels of uncertainty avoidance and collectivism exhibited in Japanese learning culture (Hofstede, 2005: 163-191). Many of those conducting previous word association tests in Japan clearly shared the same concerns. Wright (2001), Brown (2006) and Peppard (2007) adopted the terms *quiz*, *task* and *activity* respectively. I initially selected 'task' hoping to convey an air of brevity, but upon conducting a few initial tests, I reconsidered. Ultimately, I found the use of the word *game* to be most fruitful. I concede that the term is quite misleading, as a game often implies scoring to some degree. However, asking students to take part in a simple word-association *game* had the desired effect, of encouraging greater spontaneity in their responses.

### **5.2 Administering the 'Game'**

I selected 30 students in total; 10 Elementary level students, 10 Intermediate level students, and 10 Advanced level students. The gender balance was 50-50, and ages ranged from

30-75, with each group having approximately the same mix of older and younger students. All respondents are Japanese nationals, with Japanese as their first language, and English as their second language.

Eight stimulus words were selected, based upon the criteria listed in the Procedure of McCarthy's Task (Appendix A). Details are given below:

STIMULUS	PART OF SPEECH	NUMBER OF OCCURENCES IN BANK OF ENGLISH	INFORMATION REGARDING SELECTION
green	adjective, noun, verb	62421	a colour which is found both naturally and artificially in the environment
in	preposition, adverb, adjective, noun	8143020	an extremely common preposition, with potential for unrelated response due to homophonic confusion
laugh	verb, noun	14256	relatively well-known, frequent verb, but potentially susceptible to L1 interference
mouse	noun	5390	extremely well-known noun, but relatively low-frequency
rub	verb, noun	3687	low-frequency verb; highly susceptible to L1 interference
smart	adjective, verb	14401	well-known adjective, but very susceptible to L1 interference.
television	noun	74779	extremely well-known, high frequency noun
pub	noun	16865	relatively well-known noun, but extremely low-frequency in the majority of subjects' own conversation.

NOTES:

- Words presented to students alphabetically, with the exception of *pub*. This is due to concerns regarding the phonological influence of *rub* following *pub*.
- Dominant, most common part of speech listed first.

The test was administered by giving a handout to the participants (see Appendix B), and asking them to write down the first (English language) word they thought of after hearing the verbal prompt. Again, this method was in keeping with the Procedure given by McCarthy (Appendix A). I was aware that administering the test in such a manner would have serious implications for the results. Orthographic links were less likely to occur, but phonological links, and unrelated responses as a consequence of phonological miscomprehension were far more likely to occur.

After completing the ‘game’, respondents were asked to give their perceived reasons for selection of each word. This proved very difficult for the participants, even advanced learners. In actuality, interviews were conducted with the majority of respondents to ascertain further information regarding their choices. In doing so, it was often necessary to switch to the Learners’ L1. Much of this information is contained in Appendix C. It is omitted in situations where reasons are considered to be self-explanatory, and where multiple respondents gave the same word.

After conducting the word association test with the 30 students, I administered it to 10 native speakers, for comparative purposes. These results are contained alongside the students’ results in Appendix C.

### **5.3 Classifying the Responses**

There is a significant degree of variation in the literature, regarding methods of labelling responses. I elected to adopt the following system, based upon the previously discussed categories of association:

CATEGORY	SUBCATEGORY
Clang (CLAN)	
Syntagmatic (SYNT)	collocation (coll) multiword item (multi*) (*this includes compound words, binomials etc)
Paradigmatic (PARA)	synonym (syn) antonym (ant) hyponym (hyp) superordinate (sup) coordinate (cor) subordinate (sub) meronym (mer)
Encyclopaedic (ENCY)	

I also made use of the following labels in order to clarify responses which initially appeared to be unrelated:

- **\*\*PHON:** Phonological Misunderstanding
- **\*\*HOM/POL:** Misunderstanding due to Homophones, Homonyms or Polysemy \*
- **\*\*L1 INTER:** Interference from respondent's first language

(\*For the purposes of this paper, no distinction will be made between homonymy and polysemy)

## 5.4 Labelling Difficulties

The analysis of the responses proved to be extremely problematic, as a consequence of several factors. One of the most obvious areas of difficulty was being able to accurately assess the reason behind several word choices. Students found it very difficult to assess their own reasons for their choices. Even after switching to the students' L1 in interviews, it was often difficult to obtain a clear notion of why they made a particular choice. One example of this was the response 'dream' to the stimulus word 'laugh'. The elementary level student offered the

explanation that “In my dream I laugh”, and I felt obliged to list this response as syntagmatic, as he was using laugh as a verb. However, this label feels far from satisfactory.

The word ‘dream’ was also given as a response to the stimulus word ‘rub’. This time it was given by an advanced level student, who had assumed the stimulus word to be ‘love’, due to phonological misunderstanding. The reason he gave was remarkably similar: “In my dream I love”. I inquired further, and found that 30 years ago, as a student, he was in love with a classmate, and ‘dreamed’ about being with her. ‘Dream’ was now being used as a verb. Furthermore, there was clearly a great deal of the respondent’s own experiences and memories influencing his choice of word here. Should this thus be deemed to be an encyclopaedic response? At which point does the individual’s encyclopaedic knowledge become the principal reason for their word-choice?

Even in cases where the respondent’s word choice seemed relatively straight-forward, there were often problems in labelling the responses. In many cases, there were strong arguments for both labelling a response as syntagmatic, and labelling it as paradigmatic. The responses ‘drink’ and ‘drinks’ to the stimulus ‘pub’ were such words. If we assume them to be used as nouns, then the association must surely be paradigmatic. But if the respondents were thinking of them as verbs, then we would have to consider them to be syntagmatic responses. ‘Pub’ and ‘drink’ do after all seem to be strong collocates. However, even the native speakers found it extremely difficult to determine whether they had conceived of ‘drink(s)’ as a noun or as a verb. Most argued that it was simply a general image of beer glasses in hand. Furthermore, if we do decide to consider ‘drink(s)’ as a noun, how should we classify the sense relation? In the case of such noun responses to ‘pub’, I elected to classify them as meronyms. Most people would agree

that a pub's *raison d'être* is to serve alcoholic drinks, and these drinks (more specifically 'beer', 'whisky', 'wine' etc) are vital parts of the whole (pub).

## 6. Analysis of Results

### 6.1 Clang Associations

Clang associations were rare, accounting for only 13 out of the total 240 responses given by L2 learners. However, they were more prevalent in the responses of lower-level students and these findings do support the notion that more proficient language learners are less likely to make such associations:

	ELEMENTARY	INTERMEDIATE	ADVANCED	NATIVE
TOTAL NUMBER OF RESPONSES	80	80	80	80
CLANG ASSOCIATIONS	7 (8.75%)	4 (5%)	2 (2.5%)	0 (0%)

### 6.2 Phonological Misunderstandings

The incidence of unrelated associations as a consequence of the respondent miscomprehending the stimulus word was far higher than the number of clang associations:

	ELEMENTARY	INTERMEDIATE	ADVANCED	NATIVE
TOTAL NUMBER OF RESPONSES	80	80	80	80
PHONOLOGICAL MISUNDERSTANDINGS	15 (18.75%)	13 (16.25%)	6 (7.5%)	1 (1.25%)

Once again, there is a clear pattern. The number of phonological misunderstandings among elementary and intermediate-level students is certainly high enough to support Meara's opinion 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.”

(Meara, 1982: 30-31)

### 6.3 Misunderstandings due to Homophones, Homonyms or Polysemy

Differences between the various aptitude levels were less visible here. This is perhaps understandable, as the prompt words were given in isolation, without any clues as to the correct form. We would assume that most people would respond to the core meaning of the word, and this was generally the case. One elementary level student responded to ‘green’ in its context as a surface of play in golf (not entirely unsurprising, given that she works in a sports club). Thirteen out of thirty respondents (43.3%) responded to ‘inn’ rather than the intended stimulus ‘in’, but four of them work in a hotel (one native speaker also did so – again, he works in a hotel).

The most interesting of these situations was relating to the stimulus word ‘mouse’. Rather than thinking of the small rodent, six students (7.5%) responded to the computer accessory. In addition, three of the ten native speakers did the same. Perhaps we are seeing a situation where the core meaning of a word is in flux.

	ELEMENTARY	INTERMEDIATE	ADVANCED	NATIVE
TOTAL NUMBER OF RESPONSES	80	80	80	80
NUMBER OF HOM/POL RESPONSES	7 (8.75%)	8 (10%)	6 (7.5%)	4 (5%)

Despite the unconnected relationship between the stimulus words and the responses derived from the above misunderstandings, it was felt that the data could still be included, for the purposes of counting syntagmatic and paradigmatic responses. The relationship between the

answer and the word which was perceived to have been the stimulus word are therefore in the figures which follow:

#### **6.4 Syntagmatic Responses**

As expected, syntagmatic associations accounted for a large percentage of the total responses. However, there is no evidence from this study that supports the notion that lower level learners give more syntagmatic responses than advanced learners and native speaking adults:

	ELEMENTARY	INTERMEDIATE	ADVANCED	NATIVE
TOTAL NUMBER OF RESPONSES	80	80	80	80
SYNTAGMATIC RESPONSES	24 (30%)	33 (41.25%)	28 (35%)	32 (40%)

#### **6.5 Paradigmatic Responses**

Paradigmatic responses accounted for 50% or more of the answers provided by each group. However, again there is no evidence to support the hypothesis that advanced and native adult speakers give a higher ratio of paradigmatic responses than elementary and intermediate L2 learners:

	ELEMENTARY	INTERMEDIATE	ADVANCED	NATIVE
TOTAL NUMBER OF RESPONSES	80	80	80	80
PARADIGMATIC RESPONSES	49 (61.25%)	40 (50%)	43 (53.75%)	44 (55%)

It is difficult to draw any conclusions from the break-down of these paradigmatic responses, as there appears to be no discernible pattern:

	ELEMENTARY	INTERMEDIATE	ADVANCED	NATIVE	TOTALS
TOTAL NUMBER OF PARADIGMATIC RESPONSES	49	40	43	44	176
synonym	5	12	15	11	43
antonym	11	6	3	12	32
superordinate	1		3	3	7
coordinate	12	7	7	6	32
subordinate	6	4	8	3	21
meronym	14	11	7	9	41

It would seem that the nature of paradigmatic response is highly dependent on the stimulus word. One observation we can note is that comparative to the other proficiency groups, synonymy is relatively rare in elementary level respondents' answers. Obviously, we are unable to make any real assumptions from such a small body of data, but given their more limited vocabulary, it would seem appropriate that the lowest level of learners are least likely to readily think of an alternative word with the same or similar meaning to that of the stimulus.

## 6.6 Encyclopaedic Responses

The number of results classed as encyclopaedic responses was quite low, and there were none amongst the elementary group. However, I would venture that a great deal of those responses classed as either syntagmatic or paradigmatic are also highly encyclopaedic.

	ELEMENTARY	INTERMEDIATE	ADVANCED	NATIVE
TOTAL NUMBER OF RESPONSES	80	80	80	80
ENCYCLOPAEDIC RESPONSES	0 (0%)	3 (3.75%)	7 (8.75%)	4 (5%)

## 7. Word Class

As mentioned in 4.1 above, previous studies have revealed that adult native speakers' responses tend to be from the same word class as the stimulus word. My own limited research using responses from 10 native speakers appears to support this finding for the most part:

STIMULUS	WORD CLASS	MOST COMMON WORD CLASS (number of times)
<b>green</b>	<b>adjective</b>	noun (8), <b>adjective (2)</b>
<b>in</b>	<b>preposition</b>	<b>preposition (9)</b> , noun (1)
<b>laugh</b>	<b>verb</b>	adjective (4), <b>verb (2)</b> , noun (2), adverb (2)
<b>mouse</b>	<b>noun</b>	<b>noun (8)</b> , adjective (2)
<b>rub</b>	<b>verb</b>	<b>verb (5)</b> , noun (4), adverb (1)
<b>smart</b>	<b>adjective</b>	<b>adjective (7)</b> , pronoun (2), noun (1)
<b>television</b>	<b>noun</b>	<b>noun (7)</b> , verb (3)
<b>pub</b>	<b>noun</b>	<b>noun (6)</b> , verb (3), adjective (1)

Is the same true of L2 learners? The following is a break-down of the results from the 30 L2 learners, based on the primary word-class of the stimuli and responses:

STIMULUS	WORD CLASS	RESPONSE					
		NOUN	VERB	ADJECTIVE	PREPOSITION	ADVERB	PRONOUN
<b>green</b>	<b>adjective</b>	<b>27</b>	1	2			
<b>in</b>	<b>preposition</b>	<b>18</b>			12		
<b>laugh</b>	<b>verb</b>	3	<b>14</b>	12		1	
<b>mouse</b>	<b>noun</b>	<b>26</b>		4			
<b>rub</b>	<b>verb</b>	<b>24</b>	4	1			1
<b>smart</b>	<b>adjective</b>	<b>14</b>	1	<b>14</b>			1
<b>television</b>	<b>noun</b>	<b>24</b>	6				
<b>pub</b>	<b>noun</b>	<b>22</b>	6	2			

Nouns are highly prevalent in L2 learners' responses. The fact that verbs are not the most common response to the 2 verbs in the study ('laugh' and 'rub'), may be partially as a result of the phonological difficulties several experienced with both words. Regarding the adjective 'green', the lack of adjectival responses may be due to the lack of an obvious antonym, as well as the colour's ready association with many aspects of the natural environment.

## 8. Conclusion

### *8.1 Does such a word-association test tell you anything about how your learners are making mental links between words they have learnt?*

First and foremost, this word-association test reaffirms just how complicated the mental lexicon is, and how little we really understand it. Going back to the Sherlock Holmes analogy, we have to look extremely carefully at the fragments of information made available to us in order to make any tentative hypotheses. Aitchison (2003: 101) reminds us that there are a variety of links between words, ‘some strong, some weak’. I would argue that the strength of each of these links can vary from day-to-day. Vocabulary is learned incrementally, and individuals vary widely in their learning (Henrikson, 1999: 311; Schmitt & Meara, 1997: 33). There is also the issue of context. Had I for example, given the word *travel* as a general theme, prior to administering the word-association test, results would surely have been different. I actually repeated the ‘game’ with one of the original advanced respondents, after a 2 week interval. This time I gave the theme *travel* prior to beginning. While they have little validity in isolation, the results do serve as a simple example of how easily associations can be altered:

STIMULUS	ORIGINAL RESPONSE	LATER RESPONSE, WITH <i>TRAVEL</i> THEME
green	plant	car (First-class on Japanese trains s called ‘Green Car’)
in	out	hotel
laugh	smile	relax
mouse	cat	room
rub	hate	lotion
smart	intelligence	reservation
television	watch	CNN
pub	drink	Ireland

Coupled with each individual's encyclopaedic knowledge, which is constantly being revised and updated, it is difficult to envision there ever being a clear *map* of the mental lexicon. This is a concern shared by Aitchison (2003: 85).

However, such word-association tests do remain worthwhile, if only to highlight the myriad ways in which learners make links within their mental lexicon.

### ***8.2 At lower levels, are phonological similarities playing an important role?***

This does indeed appear to be the case. Although the number of actual clang association responses in this study was quite low, the total number of 'maverick responses' arising from phonological miscomprehension or confusion totalled around 30% of the total among the elementary and intermediate L2 learners.

The negative influence from the L1 was also quite prevalent in this study. We must consider how students can make use of the L1 to create positive links to the new L2 vocabulary, and avoid these negative links.

### ***8.3 Do the results bear out the characteristic types of response discussed in 3.2 (of McCarthy, 1990)?***

In this extremely small-scale piece of research, all types of response discussed by McCarthy were present in the results (other than perhaps orthographic responses, although one could argue that some of the answers were at least partly orthographic). The frequency with which results appear may not match the findings of previous research, but there are several possible reasons for this. There are the various factors mentioned in 8.1 above. At a fundamental level though, the discrepancies in the results of this study may well be largely down to the choice of stimulus

words (some are relatively low frequency words), and the manner of classifying the responses. It would be highly beneficial if there was a uniform method of classifying responses. Alas, it appears there is little likelihood of such developing in the near future, given the variations involved. Meara (1982:30) laments the difficulties he has in dealing with the paradigmatic / syntagmatic distinction, and the fact that it is rarely commented on in the literature.

#### **8.4 Tourists' Pamphlets and Spiders Webs**

The remarkable amount of variation in the ways people make links within their mental lexicons highlights how much there is to be done in truly learning a single word in any language. Aitchison (2003: 14) describes the relationship between a dictionary and the human mental lexicon as being somewhat like a tourist pamphlet of a town, and the actual town itself, as it 'gives a partial glimpse of a place as it was at some point in the past, with no real idea of how the different parts of the resort fit together to form a whole, living town'. This analogy may be equally suitable in describing the value of word association exercises in exploring the learners' lexical development. They give us a valuable glimpse, but no more.

Thus, we must continue to explore other ways of studying the mental lexicon, ways that can be used in tandem with word-association as we strive to unlock the mental lexicon, and navigate our way through all of the 'cob-webs'. Until then, we must encourage our learners to make use of each and every link they can find, in their struggle to acquire new vocabulary.

## APPENDIX A

### **Aim**

To explore the relationship between word-association and learners' lexical development.

### **Resources**

A list of test items.

### **Procedure**

1 Draw up a list of six to eight words to be used as stimuli in a simple word-association test.

Try to vary the test items, to include:

- at least one grammar/function word (e.g. preposition, pronoun).
- one or two items from the everyday physical environment (e.g. 'table', 'car').
- a relatively uncommon or low-frequency word but one which your students will nonetheless know (this will depend upon the group's level: elementary-level students might require a word like 'drink', but an advanced group can probably cope with a word like 'surrender'; your own experience will tell you what is suitable).
- a mix of word-classes (e.g. noun, adjective, verb).

2 Deliver the test to the class, asking them to write down the very first word that occurs to them when each item is heard.

3 Gather in the results and see if any patterns emerge from the responses.

### **Evaluation**

1 Does such a word-association test tell you anything about how your learners are making mental links between words they have learnt?

2 At lower levels, are phonological similarities playing an important role?

3 Do the results bear out the characteristic types of response discussed in 3.2?

McCarthy, M. (1990) *Vocabulary*. Oxford: OUP. p.152



## APPENDIX B

### WORD-ASSOCIATION GAME!

*Please write down the FIRST word that you think of, in response to each of the 10 stimulus words. Don't worry about whether your word is 'right' or 'wrong'!*

1.	5.
2.	6.
3.	7.
4.	8.

***Thanks!***

*Now please fill-in the following questionnaire:*

**AGE:** \_\_\_\_\_ **SEX (M or F):** \_\_\_\_\_ **NATIONALITY:** \_\_\_\_\_

**NATIVE LANGUAGE:** \_\_\_\_\_ **ENGLISH IS MY** 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> / 5<sup>th</sup> **LANGUAGE**

*How would you describe your current level of English?*

**BEGINNER-----LOW INTERMEDIATE----UPPER INTERMEDIATE----ADVANCED----NATIVE**

*Why did you choose each of your 8 answers in this task?*

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_

# APPENDIX C (1)

Word Association Responses: **GREEN** (*adj, noun, verb*)

RESPONSE	PART OF SPEECH	L2 LEAR. RESP. TOT	ELEM.	INTER.	ADV	NATIVE RESP.	LINK	EXPLANATION
tree	N	6	4	1	1		SYNT coll (ENCY?)	“trees are green”
leaf	N	5		3	2	1	SYNT coll	
forest	N	4	2	1	1		SYNT coll (ENCY)	“popular song, Midori no Mori (‘Green Forest’)”
plant	N	2		1	1		SYNT coll	
vegetable	N	2		1	1	1	SYNT coll	
grass	N	1	1			5	SYNT coll	
blue	Adj	1	1			1	PARA cor (ENCY)	E: “boy colours” N: “typical male colours”
signal	N	1		1			SYNT coll	“traffic lights”
tea	N	1		1			SYNT coll (ENCY)	“Japanese green tea”
pepper	N	1		1			SYNT coll (ENCY)	“I don’t like green peppers”
girl	N	1			1		ENCY (CLAN?)	“School girls’ uniforms”
love	V	1			1		ENCY (SYNT)	“I love green”
Celtic	N	1			1		ENCY (SYNT)	“My husband loves Celtic” (soccer team)
red	Adj	1	1				PARA ant (cor?)	“stop and go colours”
colour	N	1			1		PARA sup	
golf	N	1	1				PARA mer (ENCY) (SYNT?)	“putting green” **Respondent works in sports club**
lawn	N	0				1	SYNT coll	
yellow	Adj	0				1	PARA cor	“similar colours”

# APPENDIX C (2)

Word Association Responses: **IN** (*prep, adv, adj, noun*)

RESPONSE	PART OF SPEECH	L2 LEAR. RESP. TOT	ELEM	INTER	ADV	NATIVE RESP.	LINK	EXPLANATION
out	prep	11	5	3	3	9	PARA ant	
hotel	n	11	2	3	6		*HOM/POL PARA cor	**students thought of 'inn' before 'in'
door	n	3	2	1			SYNT multi	"indoor pool"
B & B	n	2		2			*HOM/POL PARA cor (ENCY)	**students thought of 'inn' before 'in' "British-style inn. You are British"
future	n	1			1		SYNT coll	
bed	n	1		1			SYNT coll (ENCY?)	"I like being in bed"
inside	prep.	1	1				PARA syn (CLAN)	
motel	n					1	*HOM/POL PARA cor	"both lower-grade of accommodation"

### APPENDIX C (3)

#### Word Association Responses: **LAUGH** (*verb, noun*)

RESPONSE	PART OF SPEECH	L2 LEAR RESP. TOTAL	ELEM	INTER	ADV.	NATIVE RESP.	LINK	EXPLANATION
smile	v	9	1	3	5		**L1 INT PARA syn	**Japanese lang. has same word for <i>laugh</i> and <i>smile</i> 'warau'
happy	adj	4		2	2	4	SYNT coll	
smooth	adj	2	1	1			**PHON PARA ant	**Students heard 'rough' (adj)
casual	adj	2	2				**PHON PARA cor	**Students heard 'rough' (adj)
young	adj	1		1			ENCY (SYNT?) (coll)	"Young people laugh"
grin	v / n	1			1		**L1 INT PARA syn	**Japanese lang. has same word for <i>laugh</i> and <i>smile</i> 'warau'
Junko	n	1		1			ENCY	"Junko just laughed!"
angry	v <sup>*1</sup>	1		1			PARA ant	"Not laugh is angry"
tight	adj	1	1				**PHON PARA ant	**Student heard 'loose' (adj)
dream	n / v	1	1				SYNT?	"In my dream I laugh"
funny	adj	1			1		SYNT coll	
love	v / n	1	1				CLAN (PARA?)	"happy things"
cry	v	1	1			2	PARA ant	
sea	n	1	1				SYNT coll	**Student heard 'rough' (adj)
wild	adj	1			1		PARA syn	**Student heard 'rough' (adj)
relax	v	1	1				PARA cor?	"happy feeling"
loudly	adv	1		1			SYNT coll	
comedy	n	0				2	SYNT coll	"We laugh at comedy"
hard	adv	0				1	SYNT coll	
Why?	adv	0				1	ENCY?	"If someone's laughing, I want to know why"

<sup>\*1</sup> Although angry is clearly an adjective, the respondent was using it as a verb, as she did not yet know the desired word 'frown'

# APPENDIX C (4)

## Word Association Responses: **MOUSE** (*noun*)

RESPONSE	PART OF SPEECH	L2 LEAR RESP. TOTAL	ELEM	INTER	ADV	NATIVE RESP.	LINK	EXPLANATION
computer	n	4	3	1		3	**HOM/POL PARA mer	
P.C.	n	2		2			**HOM/POL PARA mer	
cat	n	4	2	1	1	2	PARA cor (SYNT?) (multi)	
teeth	n	4	2	2			**PHON PARA mer	**Students heard 'mouth'
rat	n	3		1	2	1	PARA syn	
small	adj	3	2		1		SYNT coll	
Mickey	n	3		1	2		PARA sub	
animal	n	1			1	1	PARA sup	
trap	n	1			1	1	SYNT multi	
keyboard	n	1	1				**HOM/POL PARA cor	
dirty	adj	1		1			SYNT coll	"Mice are dirty"
noise	n	1		1			SYNT coll?	"Mouse makes squeak"
face	n	1			1		**PHON PARA sup	**Students heard 'mouth'
zodiac	n	1			1		ENCY	"I was born in year of Mouse"
little	adj	0				1	SYNT coll	
wee	adj	0				1	SYNT coll	

# APPENDIX C (5)

## Word Association Responses: **RUB** (*verb, noun*)

RESPONSE	PART OF SPEECH	L2 LEAR RESP. TOTAL	ELEM	INTER	ADV	NATIVE RESP.	LINK	EXPLANATION
lover	n	3	2		1		CLAN	
like	v	2	1	1			**PHON PARA syn	**Student heard 'love'
heart	n	2	1	1			**PHON SYNT multi	**Student heard 'love'
robber	n	2	1		1		CLAN	E: "Sorry. I don't know this"
bath	n	2			2		**PHON SYNT multi	**Student heard 'robe'
skin	n	2			2		SYNT coll	
family	n	1	1				**PHON SYNT coll	**Student heard 'love'
peace	n	1	1				**PHON SYNT coll	**Student heard 'love' "Love and peace to all"
zoo	n	1	1				**L1 INTER CLAN	**Student heard 'roba' (Japanese ass)
pink	adj	1	1				**PHON SYNT? coll? ENCY?	**Student heard 'love' "Pink is romantic, lovely colour!"
him	pron	1	1				**PHON SYNT coll	**Student heard 'love'
marriage	n	1		1			**PHON SYNT coll	**Student heard 'love'
machine	n	1		1			**PHON SYNT coll	**Student heard 'love'
shoes	n	1		1			SYNT coll	"I rub my husband's shoes everyday"

children	n	1		1			**PHON SYNT coll	**Student heard 'love'
dolphin	n	1		1			**PHON SYNT coll	**Student heard 'love'
map	n	1		1			CLAN?	"sorry, I couldn't think"
couple	n	1		1			**PHON SYNT coll	**Student heard 'love'
letter	n	1		1			**PHON SYNT coll	**Student heard 'love'
hate	v	1			1		**PHON SYNT coll	**Student heard 'love'
erase	v	1			1		PARA syn	
dream	n, v	1			1		**PHON SYNT coll	**Student heard 'love'
friction	n	1			1		SYNT coll	
massage	n, v	0				2	PARA syn	
stimulate	v	0				1	PARA syn	
tummy	n	0				1	SYNT coll	
muscle	n	0				1	SYNT coll	
tug	v	0				1	SYNT multi	"A rub and a tug"
sex	n	0				1	ENCY?	
hard	adv	0				1	SYNT coll	
ache	v, n	0				1	SYNT coll	
cops	n	0				1	**PHON SYNT coll	**Student heard 'rob'

# APPENDIX C (6)

## Word Association Responses: **SMART** (*adj, verb*)

RESPONSE	PART OF SPEECH	L2 LEAR RESP TOTAL	ELEM	INTER	ADV	NATIVE RESP.	LINK	EXPLANATION
clever	adj	6	1	3	2	5	PARA syn	
intelligence	n	4		1	3		SYNT? coll?	
fat	adj	3	2	1			**L1 INTER PARA ant	** Japanese lang. uses 'sumatto' (from English 'smart') to mean 'slim'
wise	adj	2	1		1		PARA syn	
cool	adj	2		1	1		PARA syn	
school	n	2			2		SYNT coll	
me	pron	1			1	2	ENCY? SYNT?	
body	n	1	1				**L1 INTER SYNT coll	** Japanese lang. uses 'sumatto' (from English 'smart') to mean 'slim'
car	n	1	1				SYNT? coll	"Smartcar is nice and cheap"
love	v,n	1	1				SYNT? coll	"I love smart man"
drink	n, v	1	1				**L1 INTER SYNT? ENCY?	** Japanese lang. uses 'sumatto' (from English 'smart') to mean 'slim' "smart drink makes us good"
slim	adj	1	1				**L1 INTER PARA syn	** Japanese lang. uses 'sumatto' (from English 'smart') to mean 'slim'
kindness	n	1	1				SYNT? coll	"My dream girl"
brain	n	1		1			SYNT coll	
scholar	n	1		1			SYNT coll	
money	n	1		1			SYNT multi	
media	n	1		1			SYNT multi	
Einstein	n	0				1	SYNT? ENCY?	
stupid	adj	0				1	PARA ant	
funny	adj	0				1	PARA syn	



# APPENDIX C (7)

## Word Association Responses: **TELEVISION** (*noun*)

RESPONSE	PART OF SPEECH	L2 LEARNER RESP. TOTAL	ELEMENT	INTER	ADV	NATIVE RESP.	LINK	EXPLANATION
<b>watch</b>	<b>v</b>	<b>5</b>	1	2	2	<b>2</b>	SYNT coll	
<b>news</b>	<b>n</b>	<b>4</b>	1	1	2		PARA sub	
<b>movie</b>	<b>n</b>	<b>3</b>	1	2		<b>2</b>	PARA sub	
<b>radio</b>	<b>n</b>	<b>3</b>	2	1			PARA cor	
<b>box</b>	<b>n</b>	<b>2</b>		1	1	<b>1</b>	PARA? syn? mer?	E: “watch the box”
<b>show</b>	<b>n</b>	<b>1</b>	1			<b>1</b>	PARA? sub?	
<b>baseball</b>	<b>n</b>	<b>1</b>	1				PARA sub	
<b>channel</b>	<b>n</b>	<b>1</b>	1				PARA sub?	
<b>star</b>	<b>n</b>	<b>1</b>	1				PARA sub?	
<b>broadcaster</b>	<b>n</b>	<b>1</b>	1				PARA mer?	
<b>NHK</b>	<b>n, adj</b>	<b>1</b>		1			PARA mer	
<b>B.S.</b>	<b>n,adj</b>	<b>1</b>		1			PARA mer	
<b>telephone</b>	<b>n</b>	<b>1</b>		1			CLAN (PARA) (cor)	
<b>forecast</b>	<b>n</b>	<b>1</b>			1		PARA sub	
<b>family</b>	<b>n</b>	<b>1</b>			1		ENCY	
<b>waste</b>	<b>v</b>	<b>1</b>			1		ENCY SYNT coll	“waste of time”
<b>commercial</b>	<b>n</b>	<b>1</b>			1		PARA sub	
<b>cartoon</b>	<b>n</b>	<b>1</b>			1		PARA sub	
<b>entertainment</b>	<b>n</b>	<b>0</b>				<b>2</b>	PARA sup	
<b>video</b>	<b>n</b>	<b>0</b>				<b>1</b>	PARA cor	
<b>relax</b>	<b>v</b>	<b>0</b>				<b>1</b>	SYNT coll	

# APPENDIX C (8)

## Word Association Responses: **PUB** (*noun*)

RESPONSE	PART OF SPEECH	L2 LEAR RESP. TOTAL	ELEM	INTER	ADV	NATIVE RESP.	LINK	EXPLANATION
<b>beer</b>	<b>n</b>	<b>8</b>	3	1	4	<b>4</b>	PARA? mer?	“That’s the reason I go to the pub”
<b>drink</b>	<b>v / n</b>	<b>5</b>	2	1	2	<b>1</b>	PARA? mer SYNT? coll	
<b>drinks</b>	<b>v</b>	<b>0</b>				<b>1</b>	SYNT coll	“He drinks there every day”
<b>whisky</b>	<b>n</b>	<b>3</b>		2	1		PARA mer	
<b>alcohol</b>	<b>n</b>	<b>2</b>	1	1		<b>1</b>	PARA mer (SYNT?) (coll?)	
<b>British</b>	<b>adj</b>	<b>1</b>			1	<b>1</b>	SYNT coll (ENCY)	
<b>club</b>	<b>n</b>	<b>1</b>	1				PARA cor (CLANG?)	
<b>dog</b>	<b>n</b>	<b>1</b>	1				<b>**PHON</b> PARA sup	<b>**Student heard ‘pug’</b>
<b>food</b>	<b>n</b>	<b>1</b>	1				PARA? mer SYNT? coll	“Pub has good food”
<b>public</b>	<b>adj</b>	<b>1</b>	1				CLANG (ENCY?)	
<b>bar</b>	<b>n</b>	<b>1</b>		1			PARA syn	
<b>wine</b>	<b>n</b>	<b>1</b>		1			PARA mer	
<b>joy</b>	<b>n</b>	<b>1</b>		1			ENCY	“Being in pub gives me joy”
<b>corn</b>	<b>n</b>	<b>1</b>		1			<b>**PHON</b> SYNT multi	<b>**Student heard ‘pop’</b>
<b>set</b>	<b>n</b>	<b>1</b>		1			<b>**PHON</b> PARA syn	<b>**Student heard ‘pack’</b>
<b>Barge Inn</b>	<b>n</b>	<b>1</b>			1		PARA sub	“Only pub in this town”
<b>England</b>	<b>n</b>	<b>1</b>			1		SYNT coll (ENCY)	
<b>party</b>		<b>0</b>				<b>1</b>	SYNT coll	
<b>crawl</b>	<b>v</b>	<b>0</b>				<b>1</b>	SYNT multi	

## APPENDIX D

### ELEMENTARY LEVEL RESPONDENTS

GREEN	IN	LAUGH	MOUSE	RUB	SMART	TELEVISION	PUB
forest	out	tight	cat	family	clever	radio	beer
golf	out	smile	computer	lover	body	show	drink
tree	inside	cry	small	peace	car	baseball	beer
forest	out	dream	computer	zoo	love	radio	club
blue	out	love	keyboard	pink	drink	channel	drink
red	hotel	smooth	computer	like	fat	watch	beer
tree	door	casual	teeth	lover	slim	star	dog
tree	door	see	teeth	him	kindness	movie	food
tree	out	casual	cat	robber	fat	broadcaster	alcohol
grass	hotel	relax	small	heart	wise	news	public

### INTERMEDIATE LEVEL RESPONDENTS

GREEN	IN	LAUGH	MOUSE	RUB	SMART	TELEVISION	PUB
plant	hotel	loudly	rat	marriage	clever	movie	beer
pepper	hotel	smile	computer	machine	clever	NHK	bar
signal	door	young	Mickey	shoes	brain	B.S.	wine
vegetable	hotel	happy	dirty	children	scholar	news	drink
leaf	B & B	Junko	P.C.	dolphin	cool	box	joy
tea	B & B	happy	teeth	map	money	movie	whisky
forest	out	angry	cat	couple	media	telephone	corn
leaf	out	smooth	noise	like	fat	watch	set
tree	bed	smile	teeth	heart	clever	watch	alcohol
leaf	out	smile	P.C.	letter	intelligence	radio	whisky

# ADVANCED LEVEL RESPONDENTS

GREEN	IN	LAUGH	MOUSE	RUB	SMART	TELEVISION	PUB
plant	out	smile	cat	hate	intelligence	watch	drink
leaf	hotel	grin	rat	erase	wise	forecast	Barge Inn
girl	hotel	smile	animal	bath	school	family	beer
love	future	happy	trap	lover	me	news	drink
Celtic	out	happy	zodiac	friction	clever	cartoon	British
forest	hotel	smile	small	bath	school	waste	beer
tree	out	funny	Mickey	robber	intelligence	commercial	beer
colour	hotel	wild	rat	skin	cool	watch	whisky
leaf	hotel	smile	Mickey	skin	clever	news	beer
vegetable	hotel	smile	face	dream	intelligence	box	England

# NATIVE SPEAKING RESPONDENTS

GREEN	IN	LAUGH	MOUSE	RUB	SMART	TELEVISION	PUB
vegetables	out	comedy	computer	stimulate	Einstein	movie	drink
grass	out	happy	little	tummy	me	relax	drinks
lawn	motel	happy	rat	massage	clever	entertainment	alcohol
yellow	out	cry	cat	cops	stupid	show	beer
grass	out	happy	animal	muscle	clever	watch	beer
leaf	out	why?	computer	tug	clever	entertainment	party
blue	out	cry	cat	sex	funny	movie	beer
grass	out	hard	trap	hard	me	box	crawl
grass	out	comedy	computer	ache	clever	video	British
grass	out	happy	wee	massage	clever	watch	beer

## REFERENCES

- Aitchison, J. (2003) *Words in the Mind (Third Edition)*. Oxford, Blackwell Publishing
- Brown, P. S. (1996) 'A Small-scale Exploration into the Relationship between Word-Association and Learners' Lexical Development.' *Assignment Bank* (www) <http://www.cels.bham.ac.uk/resources/essays/Brown%20%20Mod%203.pdf>
- Carter, R. (1998) *Vocabulary: Applied Linguistic Perspectives (Second Edition)*. Oxon, Routledge
- Henrikson, B (1999) 'Three Dimensions of Vocabulary Development'. *SSLA*, 21, 303–317.
- McCarthy, M. (1990) *Vocabulary*. Oxford, Oxford University Press
- Meara, P. (1982) 'Word association in a foreign language: A report on the Birkbeck Vocabulary Project'. *Nottingham Linguistic Circular*, 11, 29–37.
- Nation, I. S. P. (1990) *Teaching and learning vocabulary*. New York: Newbury House
- Peppard, J. (July 2007) 'Exploring the Relationship between Word-Association and Learners' Lexical Development'. *Assignment Bank* (www) [http://www.cels.bham.ac.uk/resources/essays/Peppard\\_Mod\\_2.pdf](http://www.cels.bham.ac.uk/resources/essays/Peppard_Mod_2.pdf)
- Richards, C. and Schmidt, R. (2002) *Dictionary of Language Teaching & Applied Linguistics (Third Edition)*. Essex, Longman
- Schmitt, N. (2000) *Vocabulary in Language Teaching*, Cambridge, Cambridge University Press
- Wright, B. (2001) 'Word Association and Second Language Learners' Responses'. *Assignment Bank* (www) <http://www.cels.bham.ac.uk/resources/essays/Wright3.pdf>
- Collins English Dictionary 2007* (Online Edition), Accessed online on 15<sup>th</sup> September 2007: <http://collinslanguage.com/ced/login.aspx>
- Oxford Advanced Learners' Dictionary 2002* (Electronic Edition), Oxford University Press
- The Bank of English*. Accessed September 2007, via Telnet