POSTGRADUATE STUDIES – SECOND CYCLE

**Mental lexicon developed by L1 and L2 speakers of English in Kosovo.**

Candidate:

Egzona Islami Toci

Mentor:

Assoc. Prof. Dr. Arta

Tetovo, July 2019

**Declaration of Authorship**

I hereby certify that this thesis has been composed by me and is based on my own work, unless stated otherwise. No other person's work has been used without due acknowledgement in this thesis. All references and verbatim extracts have been quoted, and all sources of information, including graphs and data sets, have been specifically acknowledged.

Date: Signature:

July, 2019 Egzona Islami

**Acknowledgements**

The writing of this thesis would not have been possible to complete without the unconditional help of many individuals therefore my deepest gratitude goes to all of the following.

Firstly, I would like to thank my thesis mentor and adviser Arta Toci for her support and continuous guidance. I would also like to thank the members of my thesis committee for their insightful feedback.

My parents, my brother, and my sisters, thank you for your love and your support, thank you for being there always for me.

Thank you to all the people who believed and supported me.

**Abstract**

Words are very important; we use them in our everyday life to understand others and to express our own ideas. To be a good speaker and to have meaningful conversations we need to have a large vocabulary, because it doesn't matter how well we learn grammar if we don't know a lot of words to express different meanings. This study is about the nature of the human word-store, about how people manage to store so many words and how do they find the words they need or want to use. So, the mental lexicon is explained as the human word store and is accessed every time we need to find a word that we want to say in order to express a meaning, or when we search for the meaning of a word that we read or hear. "The large number of words known by humans and the speed with which they can be located point to the existence of a highly organized mental lexicon." (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012)

Using quantitative methods, this study explores and compares the L1 and L2 mental lexicon. A simple word association test with stimulus words, and a depth of vocabulary knowledge test has been administered to low, middle and high ability EFL speakers and to a group of native English speakers from the KFOR command in Kosovo (Kosovo Forces). This study attempts to show how L2 speakers and native speakers make mental links between words they have learned, providing information about how words are sorted in the lexicon. The overall findings of the study show that both groups prefer syntagmatic links and paradigmatic links followed by experiential. The results of this study show that L1 and L2 mental lexicon are not structurally different, but the L2 mental lexicon is simply at an earlier stage of development.

The findings of this study are expected to contribute to a better understanding of the mental lexicon, how it works and how it is organized, and to show that vocabulary acquisition is an interesting and important area to work on. Having an understanding of the mental lexicon can facilitate the process of teaching and learning vocabulary for the English teachers and ESL students of Kosovo.

***Keywords****: vocabulary, native speaker, L2 learner, mental lexicon…*

**Parathenia**

Fjalët janë shumë të rëndësishme, ne i perdorim ato në jetën tonë të përditshme për të kuptuar të tjerët dhe per ti shprehur idetë tona. Për të qenë një folës i mirë dhe për të pasur biseda kuptimplote, ne duhet të kemi një fjalor të zgjeruar sepse nuk ka rëndësi se sa mirë ne e mësojmë gramatiken nëse ne nuk dijmë shumë fjalë për të shprehur kuptime të ndryshme. Pra, leksiku mental është spjeguar si magazinë njerëzore e fjalëve ku hyhet cdo herë që ne kemi nevojë për të gjetur një fjalë që ne duam të themi për të shprehur një domethënie, ose kur ne kerkojmë kuptimin e një fjale që ne lexojmë ose degjojmë. "Numri i madhë i fjalëve i ditur nga njerëzit dhe shpejtësia me të cilen ato mund të gjenden tregojnë për ekzistencen e një leksiku mental shumë të ogranizuar" (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012)

Duke përdorur metoda kuantitative, ky studim eksploron dhe krahason leksikun mental të folësve amtarë të gjuhës angleze dhe të folësve e anglishtes si gjuhë e dytë. Një test i thjeshtë i asociimit të fjalëve me fjalë stimuluese dhe një test i thellësis së njohuris së fjalëve është mbajtur me folësit e gjuhës angleze si gjuhë të dytë,për nivelin e ulët të mesëm dhe të lartë, dhe me një grup të folësve amtarë të gjuhës angleze me trupat e KFOR-it në Kosovë. Ky studim përpiqet të tregoj se si folësit e gjuhës së dytë dhe folësit amtarë bëjnë lidhje mentale në mes të fjalëve që ata kanë mësuar, duke siguruar informacion rreth mënyres se si fjalet janë të renditura në leksik. Të dhënat e përgjithshme të këtij studimi tregojnë se të dyja grupet preferojnë lidhje sintagmatike dhe paradigmatike pastaj eksperientale. Rezultatet e këtij studimi tregojnë se leksiku mental i gjuhës amtare dhe gjuhës së dytë nuk janë strukturalisht të ndryshëm, por leksiku i gjuhës së dytë është thjeshtë në një fazë më të hershme të zhvillimit.

Rezultatet e këtij studimi pritet të kontribuojnë në kuptueshmërinë më të mirë të leksikut mental, se si funksionon dhe si është i organizuar dhe të tregoj se pervetësimi i leksikut është një fushë interesante dhe me rëndësi për të punuar. Te kuptuarit e leksikut mental mund ta lehtësojë procesin e mësimit të fjalëve për mësuesit e gjuhës angleze dhe nxënësit në Kosovë.

***Fjalet kyce**: fjalori, foles amtare, foles i gjuhes se dyte, leksiku mental…*

**List of Tables**

**List of Figures**

**Contents**

Working title of the thesis:

“Mental lexicon developed by L1 and L2 speakers of English in Kosova”

Translation of the working title in Albanian:

“Leksiku mental i zhvilluar nga folesit burimore dhe folesit e anglishtes si gjuhe e dyte ne Kosove”

Translation of the working title in Macedonian:

“Развивањето на менталниот вокабулар од страна на говорниците на англискиот како прв и втор јазик во Косово”

# CHAPTER 1

## 1. INTRODUCTION

Since I have started learning English as a second language, I have been very interested about how people find words so fast when they need them, how they are able to understand and to be understood in a conversation in a natural and effortless way; this interest grew stronger when I started studying English. According to (Lengyel & Navracsics, 2007, p. 60) this is possible through some complex mental operations that happen in the mental lexicon and psycholinguistics have termed speech processing (perception and comprehension) and speech production.

Mental lexicon is a very interesting area to study and besides that many studies have been conducted about it, there is lack of information available about key issues such as how do we store words, how do we retrieve them, do native speakers and English learners use words in the same way and so on. According to (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 4) "Even those who deal with language professionally, such as speech therapists and teachers, know relatively little about how humans cope with all these words."

The mental lexicon is like a dictionary, a mental dictionary that is based on the associative links between words. These links are formed with experience; as we grow up and acquire a new language, these new words that we learn associate with each other, for example the word school becomes associated with teachers, books, classmates and so on. (Aitchison 2012) compares planets with the human word-store:

*"Planets might appear to the untrained observer to wander randomly round the night sky, yet in fact their movements are under the control of natural laws which are not obvious to the naked eye. Similarly, words are not just stacked higgledy-piggledy in our minds, like leaves on autumn bonfire. Instead, they are organized into an intricate, interlocking system whose, underlying principles can be discovered."* (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 5) The same as planets words are not just put on our minds in an unorganized way, but it is assumed that words are perfectly organized because of two reasons: because they can be found so fast and because there are so many of them.

This study was conducted with native English speakers from the KFOR base in Kosovo and with L2 learners of English. The topic of this paper is about how people store words in their mind, and

how they retrieve words when they need them. This paper will focus on spoken words of people whose mother tongue is English and of people who learn English as a second language.

The aim of this study is to show that both L1 and L2 speakers go through the same process when they attempt to find the words they need to use, and that the mental lexicon of the native speaker is structurally similar to the mental lexicon of the L2 learner. So, this paper is going to find out the similarities and differences among adult learners of English in Kosovo and adult native English speakers (KFOR members).

Some of the past studies tell about a structurally different L1 and L2 mental lexicon and some about a structurally similar lexicon. Different views of psycholinguistic research about the mental lexicon will be discussed in the literature review section.

## 1.1 Aims of the research

### 1.1.1 General objective

- The aim of this study is to show that both L1 and L2 speakers go through the same process when they attempt to find the words they need to use.

  So, this paper is going to find out the similarities and differences among adult learners of English in Kosovo and adult native English speakers (KFOR members).

### 1.1.2 Specific objectives

- To find out if natives use more paradigmatic associations
- To find out if second language learners use more syntagmatic responses and clang associates
- To find out if phonology plays a more important organizing role in the L2 mental lexicon than in the L1 mental lexicon

### 1.1.3 Research questions

- Does the word-association test give exact information about how L1 and L2 speakers are making mental links between words they have learnt?
- Why L2 language speakers might develop network of word associations different from native speakers?
- Can we use WAT responses as objective measures of L2 proficiency?
- Can word association information be usefully transferred between different languages?
- Do advanced L2 learners respond similarly with native speakers?

### 1.1.4 Hypothesis

- Both L1 and L2 speakers go through the same process when they attempt to find the words they need to use.
- The L1 and L2 lexicon are structurally the same.
- The responses of native speakers and of L2 speakers will be predominantly paradigmatic.
- Most of the native speakers will involve co-ordination followed by collocation, super ordination and synonymy.
- The L2 speakers with low level of competence may produce more clang responses based on phonological similarities.

# CHAPTER 2

# LITERATURE REVIEW

## 2 THE MENTAL LEXICON

The mental lexicon is not easy to be defined, for this reason its definition is rarely articulated. "The most likely reason for this is that authors and presenters know that any attempt at a definition will likely be wrong or, at the very least, incomplete." (Jarema & Libben, 2007) So, the mental lexicon is described as a human word store by using a metaphor. "The metaphor of a mental lexicon implies a thing – commonly referred to as the dictionary represented in the mind, which allows individual language users to engage in everyday processes of language comprehension and production." (Jarema & Libben, 2007)

Aitchison (2012) in his book compares the mental lexicon with the plan of the London Underground. He says that we can go down and look at the map and see the connections between stations but we cannot see directly the connections that happen in our mental lexicon. So, we can see travelers(words) entering and leaving the train but we don't have access to the system and don't see how it works. If a passenger takes a long time to arrive at the destination, we may think that a single train goes to all stations and takes a roundabout route, or we may think that the passenger changed the trains and had to wait in the stations. For a passenger who makes a fast journey, we may think that he was on a speedy train which linked all the stations rapidly. (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 30)

(Bonin, 2004, p. 28) describes the way that data about words and their meaning are stored:

*"Information about words and their meaning is stored in separate networks. One network is purely lexical and contains only phonological and orthographic information about words. The other network is purely semantic and contains all concepts, including those linked to word forms in the lexical network. In the lexical network, nodes are connected to each other on the basis of phonological and orthographic similarity. In the semantic network, nodes are connected to each other on the basis of semantic similarity. Furthermore, the semantic network is connected with the lexical network."*

According to (Seashore and Eckerson, 1940) an educated adult is supposed to know more than 150,000 words and is capable to use 90 per cent of these words actively. This claim is controversial because it is difficult to find a reliable procedure to assess vocabulary knowledge, but it is still quoted. Seachore and Eckerson used the 1937 edition of Funk and Wagnall's New Standard Dictionary of the English Language; they created a representative sample with 1,320 basic words and their derivatives and compounds; using this list of words, they tested hundreds of college students to define the words and to use them in illustrative sentences.

"The average college student turned out to know approximately 58,000 common 'basic words', 1,700 rare 'basic words' and 96,000 derivatives and compounds. The overall total comes to over 150,000." (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 6)

So, according to their research an average college student knew more than 150,000 words, but later researchers have found several flaws in Seashore and Eckerson's methodology, for example the students maybe didn't know the meaning and the usage of derivatives but they might have been able to guess it based on the basic words; and another prof of unreliability of this study is the type of dictionary used. But again, another study shows that Seashore and Eckerson's study results are not exaggerated. A similar test done 30 years later by an applied linguist shows that a college student knows under 250,000 words (Diller, 1978). "The number of words known by an educated adult, then, is unlikely to be less than 50,000 and may be as high as 250,000." (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 7)

This high number of words that humans know and the speed with which they can be located suggests that the mental lexicon is highly organized. According to (Wilson & Tyler, 1980) native speakers can recognize a word of their language in 200 ms (milliseconds), sometimes even without hearing the whole word. Evidence that humans search words fast and efficiently is the ability to detect non-words from real words. (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012) takes an example of the word "bilbow" mispronounced by a foreigner instead of the word elbow. When a native English speaker hears this word, he recognizes in less than a second that it isn't an ordinary word. "Native speakers, then, seem able to carry out a thorough search of their word-store in well under a second when they need to recognize a real word or reject a non-word." (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 8)

## 2.1 Mental Lexicon vs Book Dictionary

If we make a comparison between the mental lexicon and a book dictionary, we can say that book dictionaries are outdated because language is constantly changing and new words are added and some are fading away. Mental lexicon is not fixed, changes all the time, not just by adding new words but also by altering the meaning and the pronunciation of the words that are already there. Another difference is that book dictionaries contain limited data. According to Hudson "there is no known limit to the amount of detailed information… which may be associated with a lexical item. Existing dictionaries, even large ones, specify lexical items only incompletely" (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 12) So, the mental lexicon contains detailed knowledge of the meanings of words more than any book dictionary. "The mental lexicon is a kind of internal dictionary that contains not only the 'entries' for each word a speaker knows but also all the linguistic information about the word: its semantic content, syntactic properties, phonological shape, and so on." (Lengyel & Navracsics, 2007, p. 17)

According to (Handke 1995:49-50) as cited in (Müller, 2008, p. 3) *"The most common types of book dictionaries are encyclopedic, monolingual dictionaries, bilingual dictionaries, or dictionaries for special purposes such as synonym dictionaries, foreign word dictionaries, etc. A lexicon, by contrast, is the central module of a natural language processing system. It closely interacts with the other components of the language processor and provides detailed information about the words to be produced or comprehended."*

We can study a book dictionary easily, but to study a mental dictionary is hard. In order to create a model of the mental lexicon, psycholinguists use their own intelligence and some types of clues. "They are four main types: first, word searches and 'slips of the tongue' of normal speakers; second, the word-finding efforts of people with speech disorders; third, psycholinguistic experiments; fourth, the findings of theoretical linguistics." (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 15)

(Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 16) suggests that when people make word searches in real life it can give us lot of information about mental

lexicon. He gives an example in his book by using a passage of a novel where two men are talking about the sirens, but they couldn't remember the name 'sirens' and kept searching on their mental lexicon about animals who sing on the water, retrieving other words from their mental lexicon such as 'swans' and 'Oysters'. (Aitchison, 2012) claims that we search for a word that we have forgotten in our mental lexicon, as we search something we lost in our house, we first check the places we think it may be 'the probable neighborhood' of the object we have lost. "The intermediate stages through which a person passes in the struggle to locate a missing item may give us clues to the general organization of a whole area" (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 16)

Sometimes we can't remember a word even if we know it and we get blocked until that word comes to our mind, and sometimes we make errors during speech by picking the wrong word instead of the right one without realizing it. Slips of the tongue can give us clues about the way the mental lexicon works. For example, instead of saying 'two days' we say 'two weeks' because we get distracted during speech and pick a closely related word. These errors during speech may happen on sound or on meaning or on both of them. "MEANING: He came tomorrow (yesterday). SOUND: There were lots of little orgasms (organisms) floating in the water. MEANING AND SOUND: I don't have much sympathy with rich-looking burglars (beggars)." (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 19) The errors that occur on sound or phonological errors are more likely to happen in existing words than in non-words, for example "the error to take for 'to make' would be more likely than the error touse for 'mouse'." (Poulisse, 1999, p. 19)

To gather clues about how the mental lexicon works, researchers study patients who suffer from aphasia; a condition caused by head injury which causes speech disorders. Clinically explained "all aphasic people have in common that they have suffered some form of brain damage (from stroke, head-injury, tumour, metabolic disorder, toxicity or other aetiology), which has destroyed neuronal cells in parts of the brain on which language seems to be critically dependent." (Lesser & Milroy, 2014, p. 8) (Aitchison, 2012) claims that almost every patient who suffers from aphasia has word finding difficulties, and this is a symptom that exists in all types of aphasia. "The lexicon of aphasics can be studied either by analysing their spontaneous speech, or by

attempting to elicit words through showing pictures or pointing." (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 22)

Researchers study patients who suffer from aphasia because they think that these symptoms that these patients have, tell a lot about the way that the cognitive system is organized. "Those who carry out this type of work hope above all to find patients whose mental lexicon is selectively impaired, in that some parts may be damaged but others not. This might indicate possible subsystems within the mental lexicon." (Aitchison, 2012) Let's suppose that a patient remembers adjectives but he doesn't remember verbs; this tells that different parts of speech are organized in different parts of the mental lexicon.

## 2.2 Existing theories about mental lexicon

### 2.2.1 The prototype theory

The psychologist (Edward Bradford Titchenor, 1909) claimed that people have a fixed image for every word, but the majority of psychologists don't support this theory. For example, the word 'dog' can't have a fixed image in our minds, because someone may refer to a dog walking, someone to a dog sleeping and there are different shapes and colors of dogs, so we can't have a fixed image of the word dog. According to (Brown, 1958: 85) as cited in (Aitchison, 2012 p. 43) "The more general a term is, the more difficult it is to specify an associated image. Consider the term animal: 'If the generic image is four footed, how is it that we can identify man as an animal; if it is short-necked how can we identify the giraffe?'" So, these problems don't let other psychologists support the theory of Edward Bradford Titchenor that we have a fixed mental image for every word. They suggest that instead of a mental image of the word there should be some necessary conditions for a word to fulfill in order to encapsulate the meaning. (Aitchison, 2012 p. 43) suggests that "for each word we have an internal list of essential characteristics, and we label something as cat, or square, or cow only if it possesses the 'criteria! attributes', which we subconsciously check off one by one." For example, if we make e check list for the word 'bachelor', besides other knowledge and beliefs that people have about this word, the core condition to be a bachelor is to be unmarried. But not for all the words we can create a check list or a core condition so easily. For example, the word tiger; we all know that it is an animal, but we can't find a characteristic that is a core condition to be a tiger. They eat meat and they have

stripes; but it is not the only animal with these characteristics. “A tiger is a 'large Asian yellow~brown black~striped carnivorous maneless feline' according to one dictionary (COD), and 'a. very large Asiatic cat having a tawny coat transversely striped with black' according to another (LCED).” (Aitchison, 2012 p. 45) So, in this case is harder to create a check list because is harder to decide which of the characteristics to put in the check list. Unfortunately, the majority of words belong in this group.

According to some psychologists, people have a fixed idea for words, for example for colors they have a fixed image of the red color, and when is being spoken for the red color they only think of the true red color not the orange red or the purple red even though they may like them more, they stick to the true red. This applies to other categories as well. “Think of dogs. You all have some notion of what a 'real dog', a 'doggy dog' is. To me a retriever or a German shepherd is a very doggy dog while a Pekinese is a less doggy dog.” (Aitchison, 2012 p. 53)

(Aitchison, 2012 p. 53)tells in his book that a psychologist at the University of California at Berkeley whose name was Eleanor Rosch, over ten years ago, made some experiments to test the idea that people regarded some types of birds as 'birdier' than other birds, or some vegetables more vegetable-like, or some tools more tooly. The subject of this study were 200 psychology students, and the questionnaire was 10 pages long. The questionnaire contained different categories such as vegetables, fruits, furniture etc. students were asked to rate how well the examples were taken because each category contained 50 examples, for example the vegetable list contained cucumber, tomato, onion and so on. “Almost everybody thought that a robin was the best example of a bird, that pea was the best example of a vegetable and chair the best example of furniture.” (Aitchison, 2012 p. 53) From the clothing category as best examples were chosen shirts, skirts and dresses. The same experiment was repeated from other psychologists and the results were similar. “So people genuinely feel that some things are better exemplars of a category than others, a feeling which is not simply due to how often one comes across the word or object in question.” (Aitchison, 2012 p. 55) So, people don’t see thing equally, they have an ideal exemplar or a ‘prototype’ for every word and they decide which fruit is fruitier than others.

The characteristics of the prototype are hard to analyze and to arrange in the correct order because we can’t use all of the encyclopedic knowledge of a word that we have. For example,

from all the information that we have about birds we can use feathers, wings and the ability to fly as the most important characteristics that they have.

(Aitchison, 2012) takes as an example a conversation from the play A Day Out written by Alan Bennett:

*Ackroyd: They were Cistercian monks here ...*
*Boothroyd: It's an unnatural life, separating yourself off like that ... There wouldn't be any kids, would there? And a1lus getting down on their knees. It's no sort of life ...'*

In this conversation we can see that just by mentioning the word 'monks' Boothroyd retrieved from his memory all that information about that kind of lifestyle and not just the basic meaning of the word 'monk'. "In our memory we seem to have sets of stereotypical situations, 'remembered frameworks', which we call up as necessary." (Aitchison, 2012 p. 61) Psychologists aren't sure how these frames work, they seem to be as back up material which we access when we need it; they suggest that there are two ways in which this back-up information may work: *"Either the entries in the mental lexicon are organized so that the most important things pop up first, or, alternatively, the mind may automatically flip up considerably more information than is necessary, and humans may be very good at discarding or suppressing information that is not required."* (Aitchison, 2012 p. 62)

Even though researchers suggest that the mental lexicon works from prototypes, they cannot prove the exact number of prototypes that is in a person's mind. "However, the fact that a prototype often calls up a whole scene, in which numerous other words are involved, indicates one important fact: words cannot be dealt with in isolation. We need to consider how they are stored in relation to one another." (Aitchison, 2012 p. 62)

There are two theories about how words are related to one another: the atomic globule and the cobweb. Researchers who support the atomic globule theory argue that words are formed from a common area of 'meaning atoms' and the words which are related have atoms in common. Whereas, researchers who support the cobweb theory argue that words are identified as related as a result of the links which speakers have formed between them. "On the one hand, then, words are viewed as an assemblage of bits. On the other, they are regarded as wholes which have various characteristics and enter into relationships with other words." (Aitchison, 2012 p. 64)

Both of these theories are in harmony with the prototype theory mentioned above.

### 2.2.2 Atomic globule theory

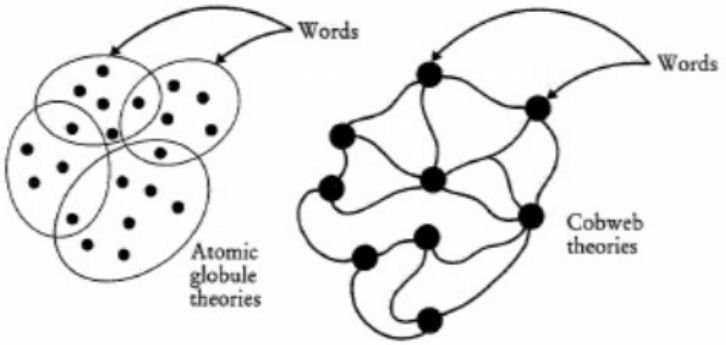


Figure 1. Atomic globules and Cobwebs (adopted from Aitchison 2012: 64)

According to (Aitchison, 2012) researchers believe in the atomic globule theory because it gives a suitable clarification of how words might be related in the mental lexicon. For example, words such as father, uncle, horse, waiter share a common basic component, that of MALE. The word *mare* can be decomposed into HORSE, ADULT, FEMALE and the word *stallion* can be decomposed into HORSE, ADULT, MALE.

The atomic globule theory is in harmony with the way the worlds seems to work. For example, as we have learnt in the subject of chemistry, chemicals can be broken down into more elemental components; some researchers suggest that there exists likeness between the decomposition of words and the decomposition of chemicals. Another similar comparison is done by psycholinguistics: “Since the sounds of language can be broken down into more basic components such as labiality (use of lips), voice (vibration of vocal cords), and so on, which

might be universal, it seems plausible that word meanings should also be broken down in this way." (Aitchison, 2012, p. 69)

### 2.2.3 The cobweb theory

The cobweb theory is known as a network theory. "A network in relation to the mental lexicon simply means 'an interconnected system'." (Aitchison, 2012 p. 72)

Most of the researchers claim that the mental lexicon is definitely a network of some type, but they don't know its structure and how to explore it. "Early work on meaning networks suggested that links between words were formed by habits: if words often cropped up together, such as pen and pencil, envelope and postage stamp, or moon and *stars*, then these frequently associated items were thought to develop extra-strong ties." This can be proven by word association tests. According to Aitchison the four most important links in the word web are: co-ordination, collocation, super ordination and synonymy, which you can see in the figure below.

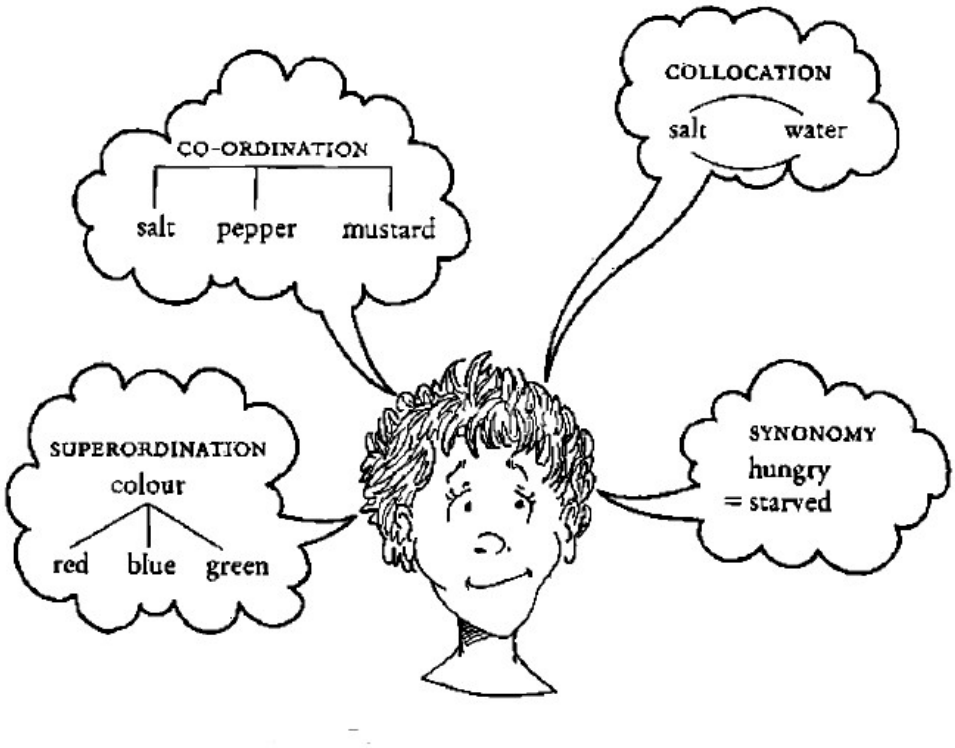


Figure 2. Types of link in the word-web (adopted from Aitchison 2012: 75)

According to Aitchison the daily errors and the word searches that people make while speaking shows that words are stored in semantic fields. For example, people while speaking confuse words, such as tomorrow with today, they confuse colors blue with green, they blend similar words together such as *sailure* (success + failure) and so on. “These errors confirm the results of word association experiments, that words are stored in semantic fields and that co-ordinates are closely associated.” (Aitchison, 2012 p. 76) Patients who suffer from aphasia are an additional support to this theory. “Aphasic patients often produce a co-ordinate or close relative of the target, as in orange for 'lemon', table for 'chair' and diving for 'swimming”. (Aitchison, 2012 p. 76)

An experiment was done with aphasic patients where they were asked to single out one object from many pictures showed in front of them. If they were asked to single out an orange, and other objects in the pictures were different things from the orange such as chair, clothes or animals it was easier for them to succeed. But if they were asked to single out an orange among other fruits it was very difficult for them to pick the right one. Aitchison argues that “such episodes suggest that some co-ordinates are so closely linked that brain-damaged people may have difficulty in distinguishing between them.” (Aitchison, 2012 p. 77)

According to Aitchison co-ordination and collocation form stronger links than superordinates and synonyms.

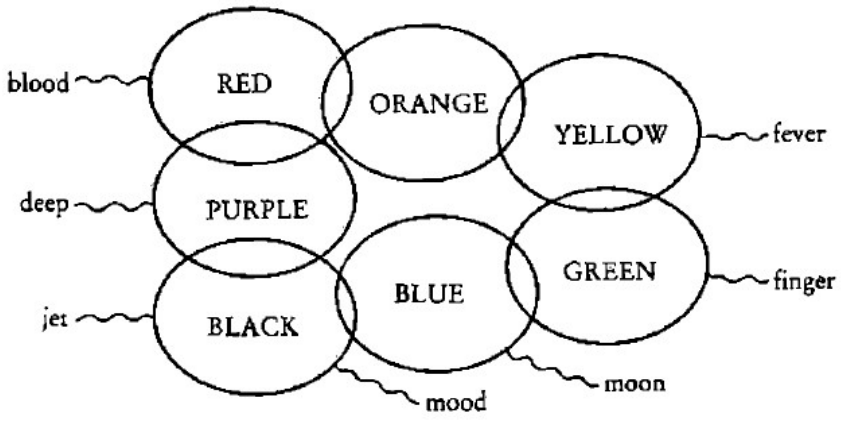

Figure 3. Strong links in the word-web (adopted from Aitchison 2012: 83)

(Aitchison, 2012, p.79) claims that collocation and coordination are the most powerful and common links, but it's not understandable how these two different types of link interact, and if one link has priority over the other.

Some researchers proposed that mental lexicon is organized in hierarchical structures, with hyponyms and their superordinate as the example in the figure below.

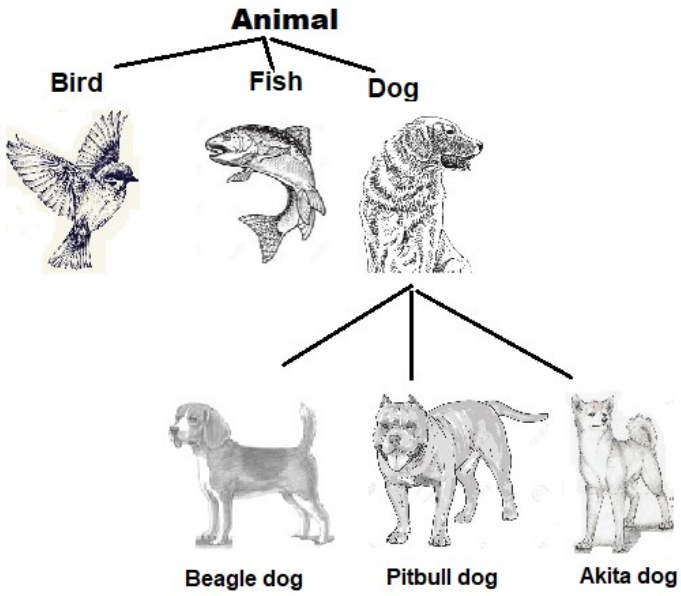


Figure 4. Layers of superordinates

The method they used to test this idea was by asking people to verify a sentence and by measuring the time they need to verify a link from one word to its superordinate, for example 'a dog is dog', 'a beagle is a dog', 'a beagle is an animal', or 'a dog is an animal'. According to Aitchison, 2012, p. 80) researchers assumed that 'the further a person had to travel on the tree in order to verify a sentence, the longer it would take'. They assumed that the fastest sentence to be verified is 'a dog is a dog', whereas the longest time would take 'a beagle is an animal', because word searching goes from beagle to dog, then from dog to animal.

## 2.3 How children build up their mental lexicon?

(Aitchison, 2012, p. 86) claims that understanding how children form their word store may help to understand how the mental lexicon is organized. According to (Clark, 1995, p. 21) “Children utter their first recognizable word around age one”, whereas According to (Guasti, 2004) children produce and understand some words when they have 10-12 months.

(Aitchison, 2012, p. 86) suggests that “children are born owning a huge room lined with empty shelves”, when they learn new words, they put them on certain shelves, in their pre-ordained place. The other alternative is that children start to organize their words in a shelf, then when this shelf is filled enough, they go to the other empty shelf; when they start having problem to find a word, they will reorganize the system by arranging different words on different shelves.

According to (Aitchison, 2012, p. 87) children undergo three tasks to acquire the word meaning: the labelling task, the packaging task and the network building task.

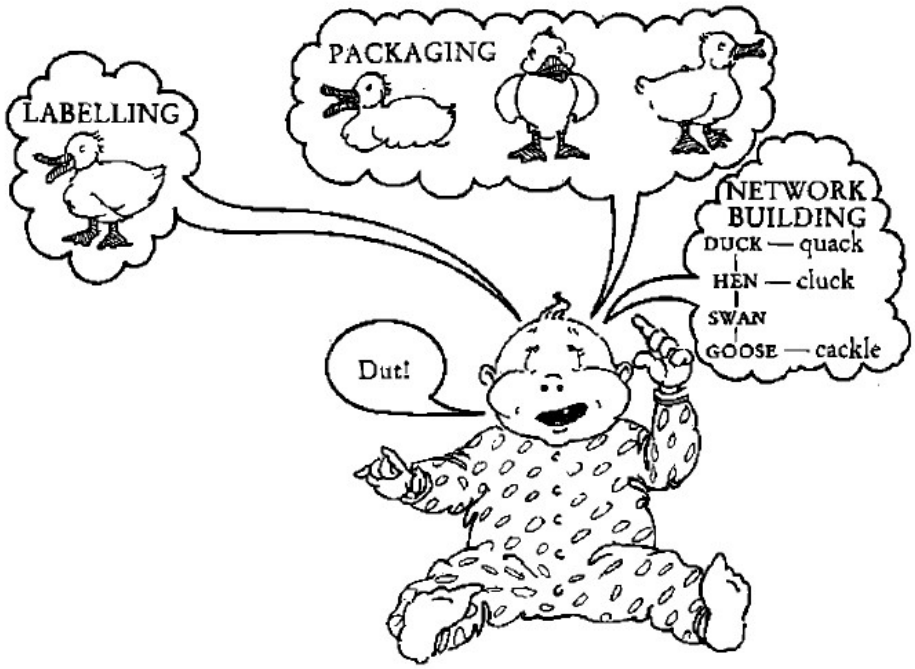

Figure 5. Tasks involved in learning the meaning of words (adopted from Aitchison 2012: 87)

Adults teach children to label by pointing out to things and by naming them, for example a chair or a toy car, then children learn to associate the names with the things being pointed at by adults. Aitchison claims that is not the same to apply a label to a thing and to use that label to different situations. For example, a child learns to label a duck, but how is she going to apply the word if she sees other type of birds, with two legs, and two wings, with feathers and with the same shape, when she only knows the word duck and doesn't know the word chicken. Maybe the child recognizes that duck and chicken are two different birds, but she labels both of them with duck because doesn't know the word chicken.

(Aitchison, 2012, p. 90) claims that "sometimes children assume that a word refers to a narrower range of things than it in fact does, whereas at other times they include far too much under a single name." Aitchison tells an example when a child had learned the word *white* when she saw snow and she associated it only with snow; she needed time to realize that the word white has wider application. (Clark, 1995, p. 33)as well takes as example the word bye, children think that they should say bye just in the case someone leaves the room. Or the word car, children may learn to label just the toy car, whereas when they see a real car outside or a car in a picture, they don't recognize it as car. "When the child first begins to use identifiable words, he does not know their full (adult meaning) meaning: he has only partial entries for them in the lexicon… The acquisition of semantic knowledge, then, will consist of adding… to the lexical entry of the word until the child's… entry for that word corresponds to the adults". Aitchison 91

When children begin to speak their early words aren't easy to recognize because they need time to acquire adult pronunciation. Firstly, they begin to add words slowly to their lexicon, then from age two, they add new words to their lexicon every day. (Clark, 1995, p. 31)states that when children add more words to vocabulary, they start to divide these words in subgroups: "words for temperature (hot, warm, cold), for color (red, blue, pink), for dimensionality (big, little, long), for surface texture (wet, sticky, clean, soft)".

From my personal experience I think that many parents make mistake by pronouncing the words like a baby, for example instead of saying *duck* they say *dut*, they try to sound cute to the baby and so they teach them wrong pronunciation.

As regards network building, (Aitchison, 2012, p. 95) claims that it happens slowly, gradually and may continue for the whole life.

## 2.4 Similarities and differences of L1 and L2 mental lexicon

"The neurolinguistic approach to bilingualism focuses on determining the manner in which the two (or more) languages are stored in the brain and how they are differentially (or similarly) processed." (Pavlenko, 2009, p. 1) According to (Ransdell & Fischler, 1987) if a person is fluent in a second language it affects a little the ability to process the first. According to (Meisel, 2011, p. 5) L2 learners have access to previously acquired linguistic knowledge and for this reason their native language may interfere with the learning of the second language. (Meisel, 2011, p. 4) in his book argues that L2 learners tend to transfer forms and meanings of their native language to the foreign language. "This fits with everybody's common-sense belief that your first language (L1) has an effect on your second language (L2)." (Cook, 2003, p. 1) He claims that both of languages influence each other. According to Cook the native language of people who know other languages is different from the native language of monolingual people.

(Cook, 2003, p. 4) states that there are people who have native-like skills in two languages, whereas I know people who know two languages but in none of them they have native-like skills. For example, my cousin who is born and raised in Germany, has learnt Albanian and German simultaneously but she doesn't have native-like skills in none of the languages.

According to (Lengyel & Navracsics, 2007) even though there is empirical evidence that supports the similarity between L1 and L2 learners, there remain evidence for differences between L1 and L2 learners that prove there are two different processing systems or two independent mechanisms of perception, comprehension and production. "The learner in both cases formulates an internalized system of abstract linguistic rules on the basis of innate principles and exposure to the language being learned, which determines the comprehension and production of the language." (Lengyel & Navracsics, 2007, p. 64) However these authors lists differences as well, such as: the L2 learner motivation is different from L1 learner who learns the language in a natural way; the age of L2 learner is different(later age); L2 learners have maturation of cognitive processes; L2 learners can use the prior knowledge of their first

language; L2 learners are able to observe and check their progress of learning the second language.

Similar differences between native language acquisition and second language acquisition mentions (Meisel, 2011, p. 8) as well:

*(1) children acquiring their L1, as opposed to L2 learners, are inevitably successful,*
*(2) L1 development is part of the child's maturational process,*
*(3) at the onset of second language acquisition, another language is already present, and*
*(4) the motivation for language acquisition is quite different in the two cases.*

(Lengyel & Navracsics, 2007, p. 65) claims that "recent research reveals that L1 transfer can occur in all linguistic subsystems of both comprehension and production among children and adults alike, and can have a negative/positive effect on L2 acquisition." So, the native language of the learner is an important factor in the process of learning the second language. According to (Gass & Selinker, 1994) "L2 comprehension is fundamentally determined by prior linguistic knowledge, which includes native language knowledge, existing L2 knowledge, language universals and the knowledge of other languages."

Besides differences mentioned above, there is plenty of evidence from many researchers that the L1 mental lexicon and the L2 mental lexicon are connected and interact. Cook (1992) cited some proofs (as cited in Lengyel & Navracsics, 2007, p. 3):

- *Reaction time to a word in one language is related to the frequency of its cognate in another known language (Caramazza & Brones, 1979).*
- *Morphemic similarities between two known languages influence translation performance (Cristoffanini et al., 1986).*
- *When processing an interlingual homograph, bilinguals access its meanings in both their languages rather than just the meaning specific to the language being used (Beauvillain & Grainger, 1987).*

This suggests that the L1 mental lexicon and the L2 mental lexicon interact with each other but doesn't support the idea of a fully unitary mental lexicon. Cook (1992) states that 'total separation is impossible since both languages are in the same mind' but also that 'total

integration is impossible since L2 users can keep the languages apart'. (Lengyel & Navracsics, 2007, p. 4) (Poulisse, 1999, p. 56) as well supports the idea of Cook that people are able to keep two or more languages apart when they wish to do so, and they can and do switch from the L2 to L1 and vice versa.

"The most widely cited model of the relationship between the L1 and the L2 mental lexicon is Weinreich's (1953) account in terms of 'subordi-native', 'compound' and 'co-ordinate' categories" (Lengyel & Navracsics, 2007, p. 8). According to Weinreich's (1953) the subordinative category in a person who knows two languages represents L2 forms as connected to L1 meanings; the compound category in a person who knows two languages represents the L1 and L2 forms as connected at the meaning level; whereas, the co-ordinate category represents each language with separated systems of form-meaning links. Some researchers suggest that relationships between the L1 and the L2 may co occur in the same mind. "De Groot (1993, 1995) proposes a mixed representational system, where concrete words and words perceived as cognates across the two languages are stored in a 'compound' manner, whereas abstract words and noncognates in the respective languages are stored in a 'co-ordinate' manner." (Lengyel & Navracsics, 2007, p. 8)
(Cook, 2003) favours a single mental system where is found balance between elements of a particular aspect of language in a particular situation.

(Wolter, 2001) takes as example the study of (Piper & Leicester, 1980), that supports the idea of a structurally similar L1 and L2 mental lexicon. They did a word association test with native English speakers and Japanese English learners who had advanced level of English and beginner level of English. The findings showed that native speakers made more paradigmatic links when the stimulus word was verb or adjective, whereas with nouns, all the three groups natives, advanced and beginners had no difference in their responses. Another evidence about a L1 and L2 structurally similar mental lexicon is a study of Stolz and Tiffany (1972) done with native speakers of English. The stimulus words were low frequency words, and the answers were predominantly clang responses and unclassifiable words. The fact that native speakers make clang responses to words that are not common to them, shows the similarity with L2 speakers who make clang responses as well when they don't know the words.

According to Wolter the high number of paradigmatic and clang responses is related to proficiency. People make paradigmatic links when they have high proficiency, whereas they make clang responses when they have low proficiency.

(Meara, 1983) based on results of several word association tests suggests that there is enough evidence to believe that the L1 and L2 lexicon are not similar and there exists significant differences between them. The results from the study of Meara show that:

*(a) the connections between words in the second language learner's mental lexicon are less stable than the connections of native speakers,*

*(b) phonology appears to play a much more prominent organizing role in the L2 mental lexicon than it does for native speakers, and*

(c) *the semantic links between words tend to differ in a systematic way from those of native speakers.* (Wolter, 2001, p. 42)

One argument for separation of L1-L2 according to (Singleton, 1999) is learning a second language after puberty, in which case the lexical operations of the second language are isolated from those of the L1. Another argument against L1 and L2 integration is the recovery of languages after brain damage. Whitaker (1978: 27) as cited in (Lengyel & Navracsics, 2007, p. 6) discuses some cases of his patients, for example the case of an English scholar who was a multilingual and after the recovery from the brain damage he recovered only some of the languages that he knew including his L1 (English). He mentions another case of a native speaker of Swiss German who after his recovery he firstly recovered French and after that Standard High German, but he never recovered his native variety. Paradis and Goldblum (1989) as cited in (Lengyel & Navracsics, 2007, p. 6) give an example of a patient who suffers from aphasia and who knows three languages; after a brain operation he had disorders in his native language but not in his other languages.

(Lengyel & Navracsics, 2007, p. 6) as well mention an important fact:

*"individuals who have more than one language at their disposal typically keep their languages apart, to the extent that where the expectation is that language x is being spoken but, in fact, language y is being used, comprehension may be blocked, even where both languages are known to the individual in question."* This may have happened to all of us, to expect another language and to be addressed with another. For example, my friend studies law in Vienna and told me that she rarely sees Albanians. She is used to talk German all the time, at the university and at home

because she only has German speaking friends, and one day when she was addressed in the street in her own native language (Albanian) she couldn't understand until she realized that the speaker was speaking Albanian. It took him two or three attempts to be understood, for the reason that she was expecting German. According to (Cook, 2003, p. 2) "Since the first language and other language or languages are in the same mind, they must form a language super-system at some level rather than be completely isolated systems." He proposes a model called 'the integration continuum'.

## 2.5 The relationship of the first and second language in the mind

### 2.5.1 The Integration Continuum

One possible explanation for the relationship of two or more languages in the mind, as seen in the figure is the idea that the speaker uses languages without connection between them.

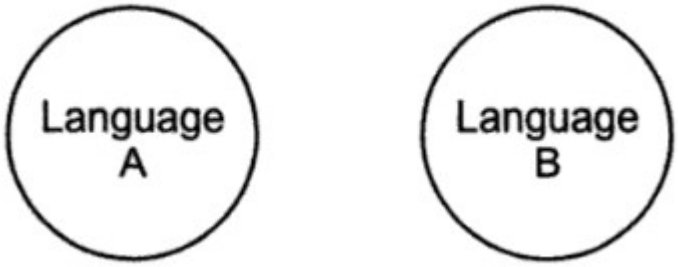


Figure 6. Separation model (adopted from Cook, 2003 :7)

This model denies the effects of the L2 on the L1 or vice versa. "The separation model forms the basis for much language teaching methodology that teaches without reference to the first language and discourages its use in the classroom, hoping that the students will build up a new language system with no links to the first." (Cook, 2003, p. 6)

The opposite idea with the separation model, is that of a single mental lexicon as shown in the figure below. Researchers claim that instead of two separate mental lexicons, the L2 speaker has a single mental lexicon where words of both languages are stored together.


Figure 7. Integration model (adopted from Cook, 2003 :7)

(Cook, 2003, p. 7)claims that neither the separation model and the integration model can be completely true, “total separation is impossible since both languages are in the same mind; total integration is impossible since L2 users can keep the languages apart.” According to Cook between total separation and total integration exist many different degrees and types of interconnection. This idea is represented in the figure below.

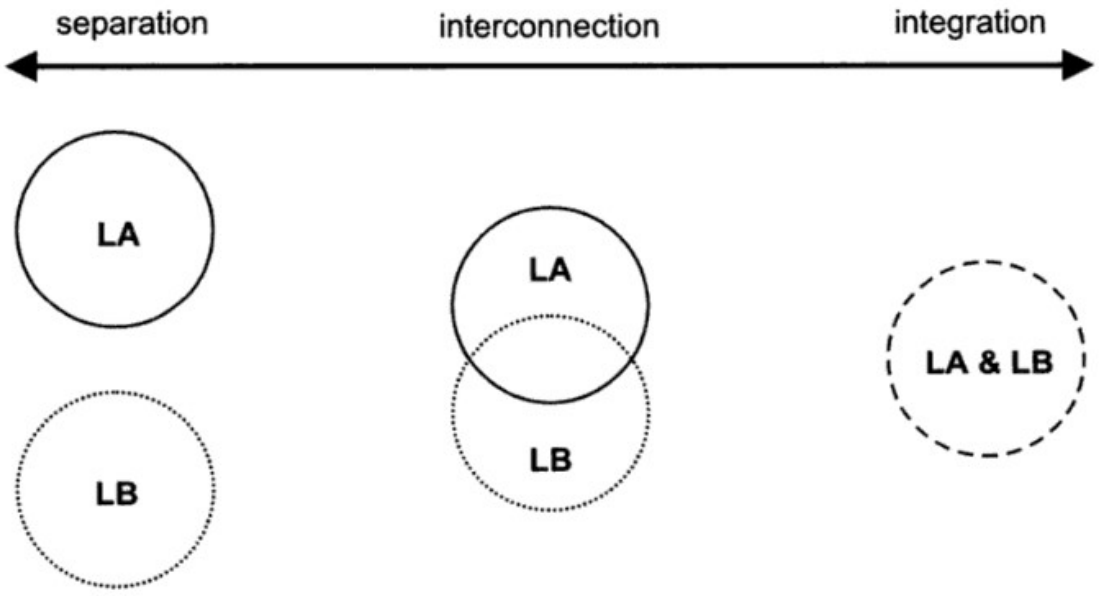


Figure 8. The integration continuum of possible relationships in multi competence (adopted from Cook, 2003 :9)

(Cook, 2003) claims that this model doesn't have to apply to the entire language system; for example, just the lexicon of the learner can be integrated, whereas the phonology separated. Also, it doesn't mean that the integration continuum applies for all people in the same way; some of them may have a more integrated mental lexicon and some of them not. For example, a person in his childhood may have an integrated single lexicon, then move to a less integrated double lexicon. (Cook, 2003, p. 9) states that "the point on the continuum may also vary from moment to moment in the individual according to his or her perception of language mode, level of tiredness and other personal factors." He compares this model with the mixer tap that merges hot and cold water, you can use both of the languages as much as you want, but you can't turn of completely neither tap. "The language mode continuum is not then about which language to use but about how much of each". (Cook, 2003, p. 10)

"The integration continuum does not spell out the separate L1 and L2 components of pragmatics, semantics, morphosyntax and phonology but, without naming the components, implies that the relationship of integration versus separation varies from component to component." (Cook, 2003, p. 11)

### 2.6 How can differences and similarities be investigated?

There are several techniques used to investigate the mental lexicon such as: word learning experiments, word searches and slips of the tongue of normal people, lexical decision tasks, the word-finding problems of aphasics, phoneme monitoring and priming and so on. According to (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 25) "experiments can give interesting insights into the mental lexicon but cannot be trusted blindly, since quite misleading conclusions may be drawn from unnatural of badly designed experiments."

The most common used technique to investigate the mental lexicon is word association test. According to (Meara, 1983) word association test is very easy to use and produces such a wealth of data with little effort. The first recorded experiment in word association is done by Francis Galton at the end of the nineteenth century. He wrote 75 words in a piece of paper, and waited some days until he forgot the words, then he wrote for each word the first idea that came to his mind. Galton's idea is still in use today; the words given are called stimulus and the subject of the research must give the first idea that comes to her mind when she reads the words, for

example ‘day’ is the stimulus word. “The subject will say, perhaps, ‘Night’ or ‘Light’ or anything else which pops into her mind in response to day.” (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 23) In the figure below you can see examples of word association responses to the stimulus words.

| | BUTTERFLY | HUNGRY | RED | SALT |
|---|---|---|---|---|
| 1 | moth | food | white | pepper |
| 2 | insect | eat | blue | sugar |
| 3 | wing(s) | thirsty | black | water |
| 4 | bird | full | green | taste |
| 5 | fly | starved | colour | sea |
| 6 | yellow | stomach | blood | bitter |
| 7 | net | tired | communist | shaker |
| 8 | pretty | dog | yellow | food |
| 9 | flower(s) | pain | flag | ocean |
| 10 | bug | man | bright | lake |

Figure 9. Word association responses (adopted from Aitchison 2012: 76)

(Meara, 1983) suggests that responses taken by word association tests fall into two main categories: syntagmatic associations and paradigmatic associations. Whereas, (Wolter, 2001, p. 43) suggests that responses fall into three main categories: paradigmatic, syntagmatic, and, phonological or “clang” responses.

(Meara, 1983)explains these categories in this way:

*“Syntagmatic associations are responses which form an obvious sequential link with the stimulus word. Given DOG, for example, bark, spotted, naughty, or bite would generally be classified as syntagmatic responses. Responses which are from the same grammatical form class as the stimulus word are classed as paradigmatic. Thus, given DOG, cat, wolf or animal would all be classified as paradigmatic responses.”*

Whereas (Wolter, 2001, p. 43) gives a more detailed explanation:

*“Paradigmatic responses are words from the same word class as the prompt word, and, as such,*

*could presumably perform the same grammatical function within a given sentence. There are four main types of paradigmatic responses, including coordinates (e.g., the prompt word dog eliciting a response of cat), superordinates (dog → animal), subordinates (dog → terrier), and synonyms (dog → canine). Syntagmatic responses, by contrast, bear a sequential or collocational relationship to the prompt word and, as such, are usually (but not always) from a different word class than is the prompt word (dog → bite, or bark). Clang responses are defined as responses that resemble the prompt word only phonologically, and bear no overt semantic connection to the prompt word (dog → bog).''*

So, by syntagmatic links we understand the relationship that a linguistic component has with other components in the area of the language in which it takes place, whereas by paradigmatic links we understand the relationship that a linguistic component has with components with which it may be replaced or substituted (Palmer, 1981, p. 93). For example, "in a red door and a green door, red and green are in paradigmatic relation to each other, while each is in a syntagmatic relation with door." (Palmer, 1981, p. 68)

(Wolter, 2001) claims that language proficiency plays an important role and is related to patterns of responses, so he suggests to do investigation that seeks to test a depth of individual word knowledge (DIWK). "A DIWK model views the connections in both the L1 and the L2 mental lexicon as conditioned not by language proficiency or word frequency per se, but by how well particular words are known to a given speaker." (Wolter, 2001, p. 46)

According to Wolter words have different statuses in the mind. The process of knowing a word is not two optional (one knows a word or doesn't know it), but there are degrees to knowing a word. "The mental lexicon can be viewed as consisting of a core vocabulary containing well-known words and several layers of peripheral vocabulary consisting of words that are known to varying degrees" (Wolter, 2001, p. 47) Wolter presents degrees of knowing a word in the figure below.

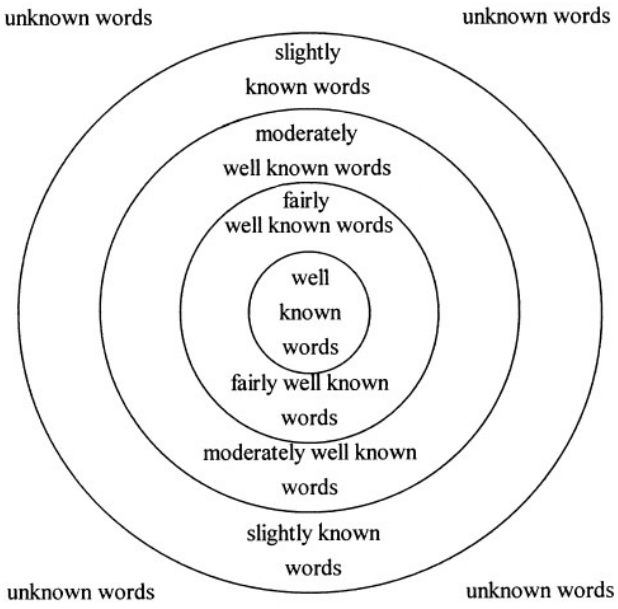


Figure 10. Depth of word knowledge model of the mental lexicon (adopted from Wolter 2001: 48)

We can see in this figure different levels of word knowledge, in the center of the circle are well known words whereas in the outer circles are slightly known words. According to (Wolter, 2001, p. 47) "paradigmatic responses would be formed between words in the center circles, syntagmatic connections between words slightly further out, and phonological associations between words located on the periphery." According to (Carter, 1998, p. 19) words don't exist in isolation and their meanings are defined through the sense relations they have with other words. These relations are showed by the results of word association tests. The most important networks between words are listed in the figure below.

| | |
|---|---|
| Contrast or antonymy | Wet - dry |
| Similarity or synonym | Blossom - flower |
| Subordinate classification | Animal - dog |
| Coordinate classification | Apple - peach |
| Superordinate classification | Spinach - vegetable |

Figure 11. Examples of main networks and word associations adopted from Slobin (1971 in Carter 1998: 19)

(Carter 1998, p. 20) considers that relationships between words are classified through antonymy, synonymy and hyponymy relations.

## 2.7 Paradigmatic links

### 2.7.1 Co-ordination

According to (Aitchison, 2012) previous researches show that the most common response for native speakers in word association tests is co-ordination. He defines coordinates as:

*"words which cluster together on the same level of detail, such as salt and pepper; butterfly and moth; red, white, blue, bla&k, green. Opposites come into this category, as they are co-ordinates in a group consisting of only two members, as with left and right, or they are the two commonest members in a larger group, as with hot, cold, warm, cool."* (Aitchison, Words in the Mind: An Introduction to the Mental Lexicon, 2012, p. 75) So, part of this category are antonyms and hyponyms.

### 2.7.2 Hyponomy

(Joshi, 2014) defines hyponym as a word that denotes particular item from general category. According to (Saeed, 1997, p. 68) hyponomy is a relation of inclusion; a hyponym includes the meaning of a more general word, e.g. dog and cat are hyponyms of animal, tulip and rose are hyponyms of flower. "The 'upper' term is the SUPERORDINATE and the 'lower' term the HYPONYM." (Palmer, 1981, p. 76)

### 2.7.3 Synonymy

According to (Palmer, 1981, p. 59) Synonymy means 'sameness of meaning'. According to (Saeed, 1997, p. 65) synonyms are different phonological words which have the same or very similar meanings. Example: Couch/sofa Lawyer/attorney Large/big. Dictionaries usually rely on synonymy and description. For example, synonymy makes it possible to define *possibility* as *chance* or *true* as *accurate.*

(Webster, 1984, p. 24) defines synonyms as "words which agree in expressing one or more characteristics ideas in common (with the entered word)". There doesn't exist total synonyms

because we can't find two words which have exactly the same meaning. For example 'deep or profound may be used with sympathy but only deep with water, a road may be broad or wide but an accent only broad.' (Palmer, 1981, p. 63) (Carter, 1998, p. 20) thinks the same that there are no totally substitutable synonyms, and synonyms doesn't have to be ' words that should be totally interchangeable in all contexts'.

### 2.7.4 Antonymy

According to (Postman & Keppel, 1970, p. 393) antonym is the most common form of paradigmatic response. (Palmer, 1981, p. 78) states that the term antonymy stands for 'oppositeness of meaning'. Words that have opposite meanings are antonyms, such as bad/good, big/small, wet/dry, alive/dead. According to (Palmer, 1981, p. 81) 'to say something is NOT the one is to say that it is the other.' For example, to say that someone is dead is to say that he is not alive, to say that I am married is to say that I am not single. This happens when there are only two possibilities, but not with the gradable antonyms. "Thus we have not just hot/cold, but hot/warm/cool/cold, with the intermediate warm and cool forming a pair of antonyms themselves." (Palmer, 1981, p. 80)

(Webster, 1984, p. 26) defines antonyms as words which express one or more negative ideas with a given word. She divides antonyms in two categories, those of contradictory terms and those of contrary terms:

*"(1) Contradictory terms are so opposed to each other that they are mutually exclusive and admit no possibility between them. If either is true, the other must be false; if either is false, the other must be true.*

*(2) Contrary terms are so opposed in meaning that the language admits no greater divergence. They are the true "diametrical opposites." But they must be of or must apply to things of the same genus or fundamental kind. Thus, white and black represent the extremes in color, the former, as popularly understood, implying the absorption of all colors and the latter implying the privation of every vestige of color."*

## 2.8 Syntagmatic links

### 2.8.1 Collocations

The term collocation is used for words that occur repeatedly together in a language. According to (Cowie, 2009, p. 49) collocations are typically pairs of words fitting a grammatical pattern; these are verb + noun and adjective + noun, and verb + adverb (e.g. fail miserably). According to (McCarthy, 2006, p. 6) "A collocation is a pair or group of words that are often used together. These combinations sound natural to native speakers, but students of English have to make a special effort to learn them because they are often difficult to guess."

(Palmer, 1981, p. 96) claims that based on some studies of collocations, the co-occurrences are determined both by the meaning of the individual words and by conventions about 'the company they keep'. For example, we can use both abnormal and exceptional with weather but not with child; an abnormal weather is an exceptional weather, but an exceptional child is not an abnormal child. According to (McCarthy, 2006) some collocations are very strong such as *take a photo,* we cannot replace the verb *take* with another verb that can collocate with *photo* ang give the same meaning. Whereas some collocation are open and different words can be used to give the same meaning. Sometimes we can hear a collocation and understand the meaning even if it is wrong and it is not a normal collocation. "If someone says / did a few mistakes they will be understood, but a fluent speaker of English would probably say I made a few mistakes." (McCarthy & O'Dell, English Collocations in Use: How Words Work Together for Fluent and Natural English ; Self-study and Classroom Use, 2006, p. 6) "The relationship of collocation is fundamental in the study of vocabulary; it is a marriage contract between words, and some words are more firmly married to each other than others." (McCarthy, Vocabulary, 1990, p. 12)

### 2.8.2 Phonological and Orthographical links

Sometimes learners make mental links that have phonological rather than semantic resemblance. These types of links are called phonological links or clang associations. According to McCarthy (1990: 35) people make phonological links when they response with a word that has similar sound structure to the stimulus word, for example *boat* and *coat*. Learners who have low level of proficiency and children learning their native language are more inclined to form this type of links (McCarthy, 1990; Meara, 1982; Wolter, 2001).

### 2.8.3 Encyclopaedic links

Encyclopaedic links are based on the participant's word knowledge and personal factors such as nationality, age, interests and so on. According to (McCarthy, Vocabulary, 1990, p. 40)"Native-speakers can say a lot more about a word than just what co-ordinates, collocates, and superordinates, or what synonyms it has." He takes as example the word 'war', when he hears it his knowledge of the word associates with death, murder, refugees, gas masks, two world wars. This is called encyclopaedic information that is collected over many years from personal experience and may provide links between words. "Encyclopaedic knowledge relates words to the world, and brings in origins, causes, effects, histories, and contexts." (McCarthy, Vocabulary, 1990, p. 41) It is assumed that native speakers are more likely to produce encyclopaedic word associations since they have a longer personal knowledge of words, however, previous research shows that L2 speakers as well tend to make associations based on their personal memories or feelings.

## 2.9 About this study

Mostly of the previous researches available are focused on native speaker associations, rather than on comparing the L1 and the L2 mental lexicon. Recently the interest to investigate and compare the L1 and the L2 mental lexicon has grown because the researchers suggest that understanding how the mental lexicon works can help second language learners with lexical development and vocabulary growth. (Kormos, 2011) states that:

*"By being familiar with the mental processes involved in producing L2 speech, teachers can understand the problems their learners have to face when learning to speak, course book writers can produce more efficient teaching materials, and language testers can develop instruments that can measure oral language competence in a more valid way."*

Therefore, the aim of this study is to show that both L1 and L2 speakers go through the same process when they attempt to find the words they need to use, and that the mental lexicon of the native speaker is structurally similar to the mental lexicon of the L2 learner.

# CHAPTER 3

## 3 RESEARCH METHODOLOGY

This section will provide information about the methodology of the study, that is, information about the participants, instruments of research as well as the procedure of the data analysis.

### 3.1 Participants

The participants of this study were 10 Albanians who speak English as a second language and 10 KFOR members who are native English speakers. The participants were adults in the 20 to 40-year-old age bracket, and were approached individually. The Albanian participants were 3 with low ability, 3 with middle ability and 4 with high ability. In order to examine if both L1 and L2 speakers experience the same process when they attempt to find the words they need to use; a quantitative research was conducted. All of them were approached online and received a link to complete the test. The preliminary test took place in June whereas the final test in July.

### 3.2 Instrument

In order to assess participants' lexical competence a word association test (WAT) and a depth of individual word knowledge test (DIWK) was used.

#### 3.2.1 Word association test

The WAT test is a complex process which allows the linguists to test the link between word knowledge and integration; this process involves comprehension, storage, retrieval and production skills. The WAT test consisted of a list of eight stimulus words, which were selected from different word classes in order to achieve a richer set of data, one grammar function, a low frequency word, and items from the everyday physical environment. Postman and Keppel suggests that we should be careful when we choose stimulus words, because in English exist words that sound alike and look alike but have different meanings, and participants may get confused about the intended meaning. "For example, the word ball may mean either a round or roundish thing, or it may mean a large formal party for dancing." (Postman & Keppel, 1970, p. 361)

The procedure of word association test was done by following the Task 123 of Michael McCarthy's Vocabulary:

"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." (McCarthy, Vocabulary, 1990, p. 152)

### 3.2.2 Depth of Individual Word Knowledge Test.

To test the hypothesis of this study a depth of individual word knowledge test was done to understand how well participants know the stimulus words. This test was done by using the Vocabulary Knowledge Scale (VKS) as developed by Wesche and Paribakht (1996) and is the most known and accepted measure for vocabulary depth. The format of the VKS is:

I. I don't remember having seen this word before.
II. I have seen this word before, but I don't know what it means.
III. I have seen this word before, and I think it means . (synonym or translation)
IV. I know this word. It means . (synonym or translation)
V. I can use this word in a sentence: .(Write a sentence). (If you do this section, please do section IV.

DIWK test results will be scored by using the vocabulary Knowledge scale: if a word is unfamiliar the score is 1, if a word is familiar but the meaning is not the score is 2, when a correct synonym or translation is given the score is 3, when the word is used in a sentence with semantic appropriateness the score is 4, and when the word is used in a sentence with semantic appropriateness and grammatical accuracy the score is 5.

### 3.3 Preliminary testing

I conducted a preliminary testing to see if everything is understandable and if there are any flaws in the word association test and in the depth of vocabulary knowledge test. I made the tests online and sent it to friends and relatives, whose native language is Albanian. Four of them were advanced speakers of English, three of them were in intermediate level and three of them were beginners. Each of them completed a word association test (WAT) and a depth of vocabulary knowledge test.

### 3.4 Preliminary data collection

I conducted a WAT test which consisted of ten stimulus words taken from different parts of speech by following the Task 123 of Michael McCarthy's Vocabulary. The data collection was made online on the internet. I used a site www.surveyhero.com to create the tests and to send them to the participants. I approached my friends and relatives on Facebook and sent them the link of the survey. On top of the page were given instructions of what to do, then were the stimulus words with a space provided to write the first word that comes to their mind, then was required some personal information and after that, in order to understand the participants' depth of word knowledge, they completed the depth of vocabulary knowledge test (DIWK test), for each of stimulus words by using the vocabulary knowledge scale (VKS) created by Paribakht and Wesche (1997).Some of them who are advanced speakers of English didn't make any questions and just completed the tests whereas some of them didn't understand what they had to do and made a lot of questions. After they completed both of tests and clicked finished, the surveys with responses were saved in my account in that page.

### 3.5 Discussion of preliminary testing

The preliminary testing pointed out some mistakes and unclarity in both tests especially in the depth of vocabulary knowledge test. The instructions I gave in the WAT weren't enough to understand what they have to do so I should give additional instructions and information in the

final testing. I also should reduce the number of stimulus from ten to eight because eight is enough and is the model of Michael McCarthy's Vocabulary. The depth of vocabulary knowledge test was unclear for most of the participants because they didn't know how to respond because they had a multiple choice for each word and a section to write the answers. It seems that there was not enough instruction and they didn't understand how to answer.

The preliminary testing was done just with foreign English speakers to test the validity and the reliability of the test and to see how much it is comprehensible and what changes are needed. It wasn't done with native English speakers because it is harder to approach them so they are going to participate just in the final testing.

## 3.6 Changes made after preliminary testing

After the preliminary testing revealed some problems, several changes were made to improve the tests. First of all, I changed the instruction section of both tests, where I added more detailed instructions because participants didn't understand what they were asked to do. Then, I reduced the number of stimulus words from ten to eight, because ten is unnecessary and eight is the number suggested by the Michael McCarthy and is enough for the purpose of understanding how participants make mental links. I couldn't change the multiple-choice questions model of the depth of vocabulary knowledge test because the test was made online and there weren't other appropriate models, so I just added more instructions which I hope will be helpful in the final testing.

## 3.7 Final Data Collection

### 3.7.1 Word Association Test (WAT)

To test the hypothesis of the study the data were analyzed by comparing the pattern of responses between L1 and L2 participants, and by assessing the responses with five possible scores of VKS. The results from word association test are presented in tables (see appendix) together with other factors such as the level of proficiency of L2 participants and the lexical link. I checked stimulus words and responses one by one to find the most probable link. The links together with their abbreviations are presented in the table below.

Table 1. Lexical Links and Abbreviations

| **Lexical Link** | **Abbreviation** |
|---|---|
| Collocation | Coll |
| Syntagmatic | Syntag |
| Paradigmatic | Para |
| Experiential | Exp |
| Co-ordination | Co-ord |
| Superordinate | Super |
| Synonym | Syn |
| Phonological | Phon |

### 3.7.2 Depth of word knowledge test (DIWK)

The results for DIWK test were classified according to Criteria that was used by (Wesche and Paribakht, 1996 and Mattoudakis 2003) taken from (Bruton, 2009)

Table 2. VKS and Scores

| **Score** | **Criteria** |
|---|---|
| 1 | A score of 1 is assigned if the word is not familiar at all |
| 2 | A score of 2 when the word is familiar but the meaning is not known |
| 3 | A score of 3 when a correct synonym or translation is given |
| 4 | A score of 4 is given to a word when it is used with semantic appropriateness in a sentence |
| 5 | A score of 5 is assigned when the word is used with semantic appropriateness and grammatical accuracy in a sentence |

# CHAPTER 4

## 4 RESULTS

In the following sections I will present the findings from the WAT test and DIWK test in order to test the hypothesis of this study. The findings from each test will be presented and discussed to test the hypothesis that both L1 and L2 speakers have a structural similar mental lexicon and go through the same process when they attempt to find the words they need to use.

### 4.1 Results from WAT

In the table below are presented the data from the word association test, the total number of responses of L1 and L2 participants. The data have been classified into 'categorized' and 'uncategorized' responses. A response was sorted as 'uncategorized' when it didn't form any lexical link with the stimulus word or when the respondent didn't give a response at all. The total number of word associations was 160, 80 L1 links, and 80 L2 links.

Table 3. Categorized and Uncategorized Responses in the WAT

| Lexical Links | L1 and L2 Participants (Total – 160 Word Associations) | |
|---|---|---|
| Frequency | Categorized | Uncategorized |
| | 155 | 5 |

As we can see from the table. 155 responses from the WAT were classified as categorized, whereas just 5 responses were classified as uncategorized. The number of categorized responses is much larger than the number of uncategorized responses. If there would exist any standardized method of classifying WAT results would be easier to classify the responses but it doesn't exist, so the process of classifying the responses was a little problematic because some of the responses could be either syntagmatic or paradigmatic depending on the way that a participant thought the association. For example, one of the stimulus words was 'kitchen', and the response

was ‘counter’; I had to decide if ‘counter’ was a hyponym or a collocation. The figure below shows the percentage of responses for both L1 and L2 participants.

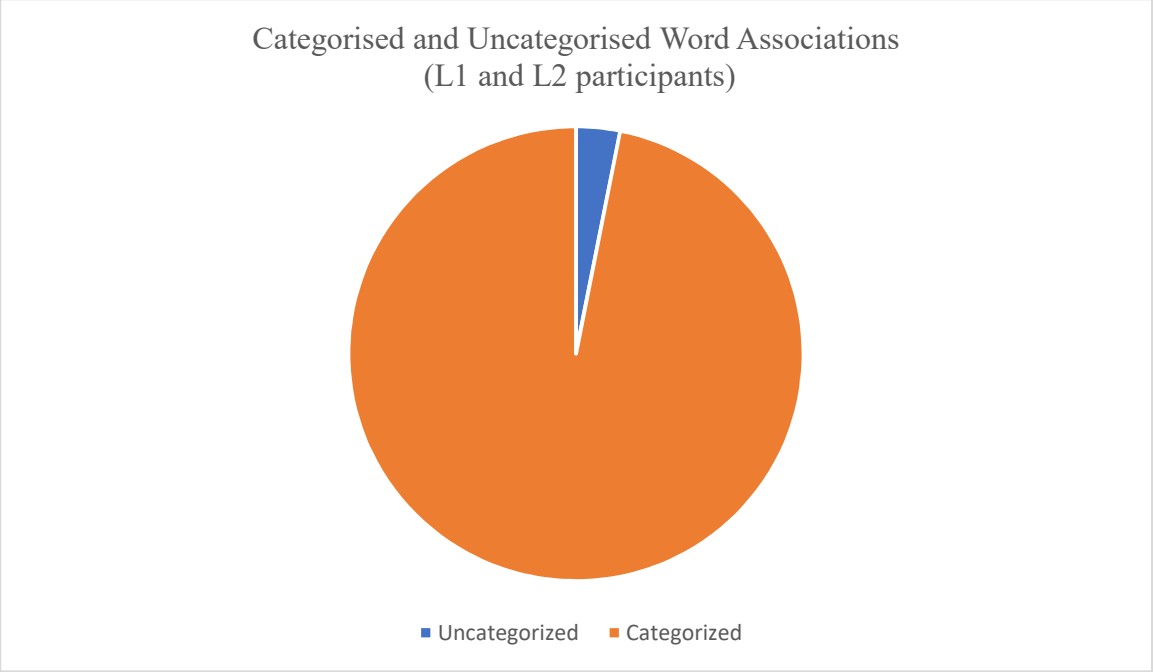


Figure 12. Categorized and Uncategorized responses

So, this figure shows that a larger percentage of L1 and L2 participants gave a categorized response, whereas a very small percentage were classified as uncategorized.

### 4.1.1 L1 Responses

The table below shows that all of the L1 responses were categorized responses.

Table 4.Categorized and Uncategorized L1 Word Association responses

| Lexical Links | L1 Participants (Total – 80 Word Associations) | |
|---|---|---|
| Frequency | Categorized | Uncategorized |
| | 80 | 0 |

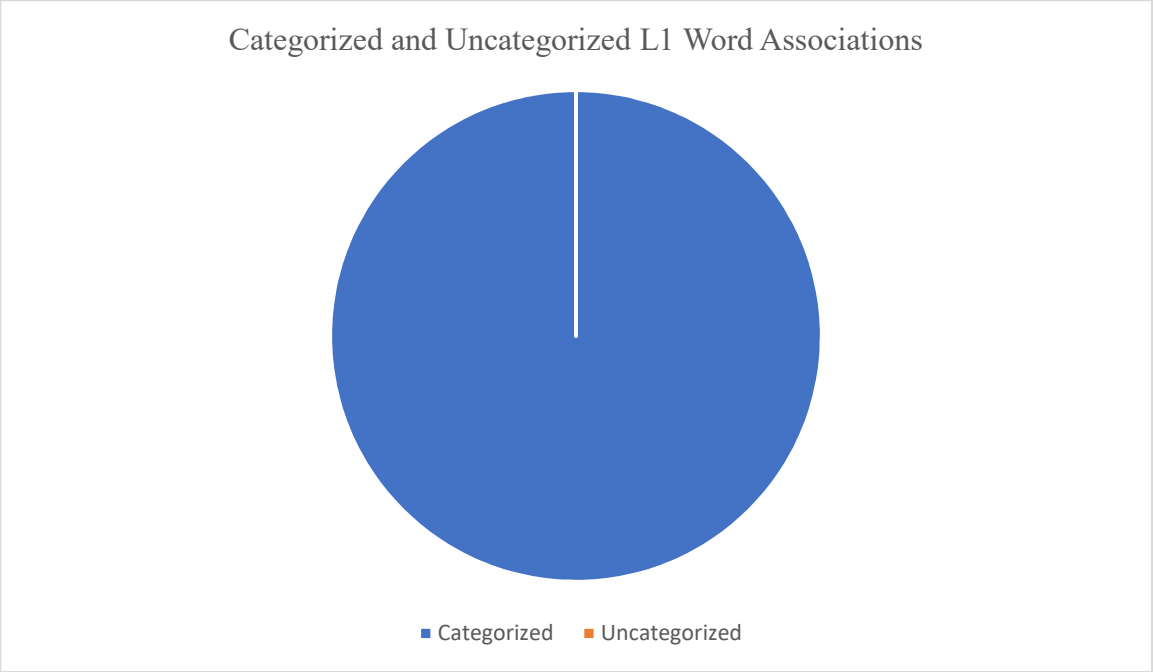


Figure 13. Categorized and uncategorized L1 word associations

The figure above shows the percentage of L1 responses from the WAT, which is 100% categorized.

### 4.1.2 L2 Responses

As we can see from the following table, from the total number of 80 responses of L2 participants, 5 were classified as uncategorized responses.

Table 5. Categorized and Uncategorized responses of L2 participants

| Lexical Links | L2 Participants (Total – 80 Word Associations) | |
|---|---|---|
| Frequency | Categorized | Uncategorized |
| | 75 | 5 |

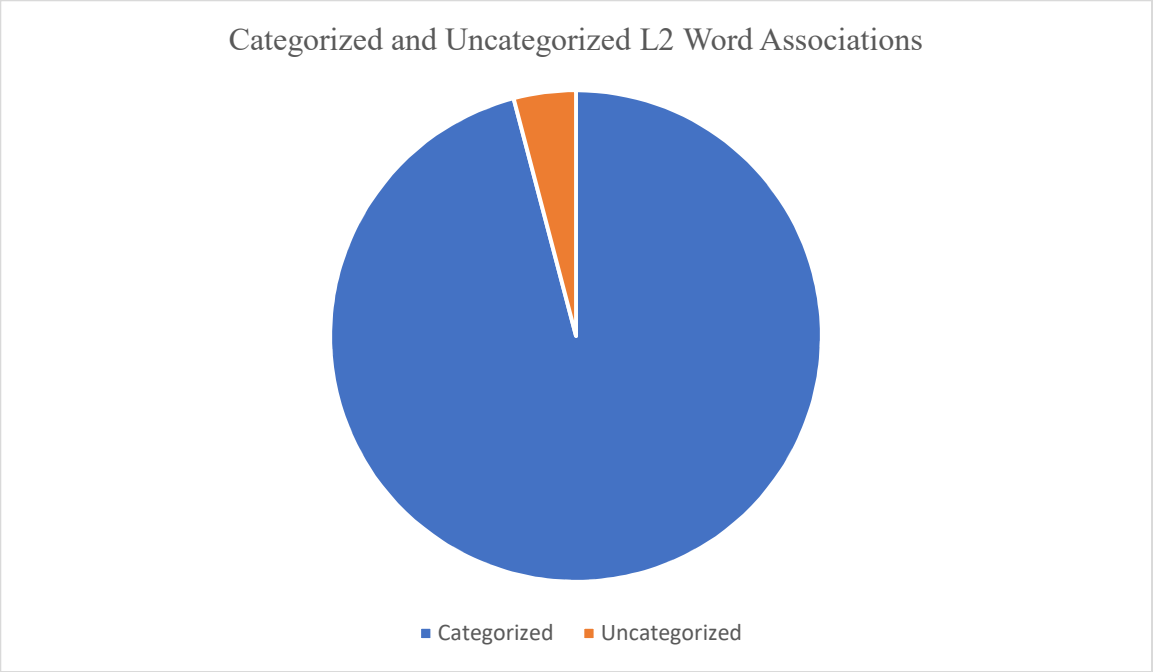


Figure 14. Categorized and Uncategorized L2 Word Associations

Both figure and table above show that the uncategorized responses come from L2 participants. From the total 80 responses of L2 participants of WAT, 5 of them were uncategorized.

### 4.1.3 Lexical links in L1 and L2 Categorized Responses

The table below shows the links that were formed from categorized responses of L1 and L2 participants. In general, the main links that are formed from WAT are phonetic, paradigmatic, syntagmatic, and experiental. The most common lexical link in this study was syntagmatic, whereas the less common was phonetic. After syntagmatic link came paradigmatic followed by experiental link.

Table 6. Lexical links in L1 and L2 Categorized Responses

| Lexical Links | L1 and L2 Participants (Total – Word Associations) | | | |
|---|---|---|---|---|
| Frequency | Phonetic | Paradigmatic | Syntagmatic | Experiental |
| | 0 | 50 | 63 | 42 |

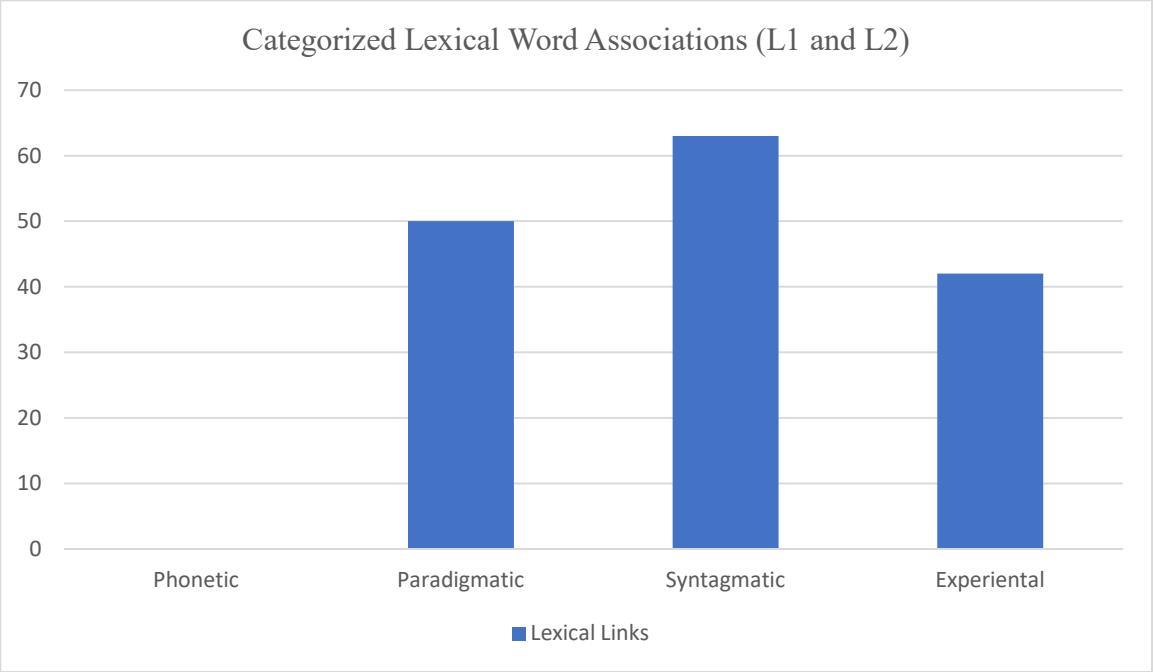


Figure 15. Categorized Lexical Word Associations

This figure shows the percentage of the most common links of both L1 and L2 participants.

In order to test the hypothesis of this study, L1 and L2 lexical links must be investigated separately. By finding the most common link of each group and the lexical strategies used during the word association test, will allow to reveal and use the possible differences of the participants to prove or disprove the hypothesis.

The data below shows how L1 and L2 participants make mental links such as phonetic, paradigmatic, syntagmatic and experiental links. The lexical links are presented in tables below and the frequency of usage is compared between the two groups.

Table 7. Data of L1 participants

| Lexical Links | L1 Participants (Total – 80 Word Associations) | | | |
|---|---|---|---|---|
| Frequency | Phonetic | Paradigmatic | Syntagmatic | Experiental |
| | 0 | 27 | 30 | 23 |

Table 8. Data of L2 participants

| Lexical Links | L2 Participants (Total – 75 Word Associations) | | | |
|---|---|---|---|---|
| Frequency | Phonetic | Paradigmatic | Syntagmatic | Experiental |
| | 0 | 23 | 33 | 19 |

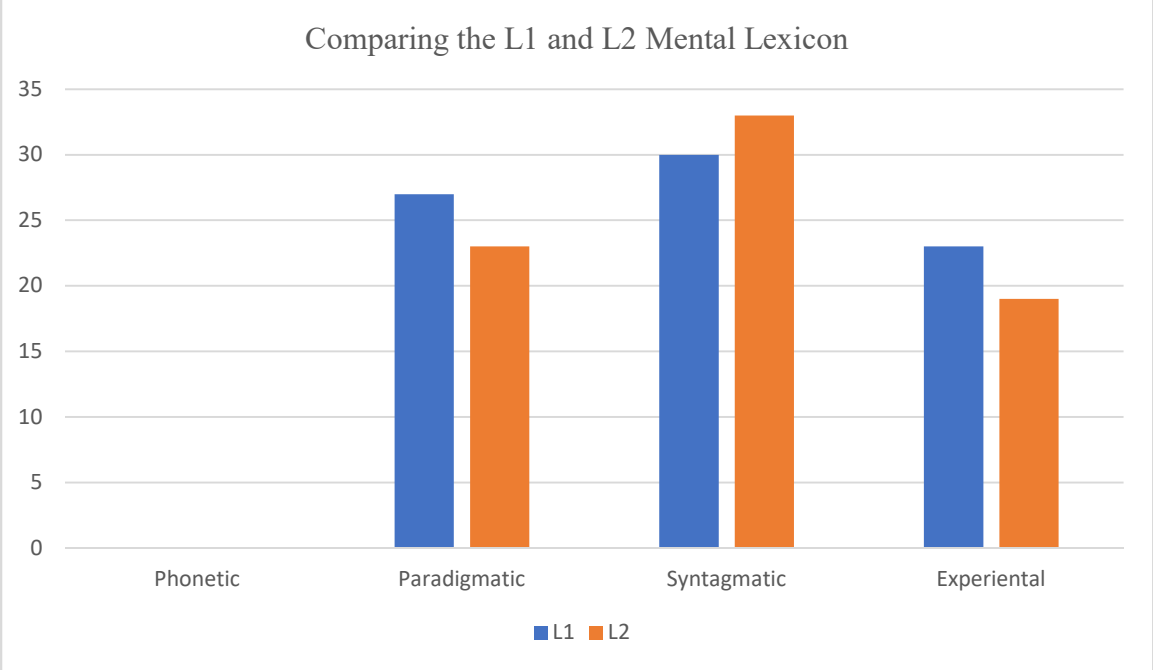


Figure 16. A comparison of L1 and L2 Lexical Links

This figure shows the types of lexical links and the number of responses of both groups L1 and L2. As we can see from the figure the most common and used link by both groups is syntagmatic link followed by paradigmatic link. There are 30 syntagmatic responses and 27 paradigmatic responses from the total 80 responses of L1 participants. Whereas, there are 33 syntagmatic responses and 23 paradigmatic responses from the total 75 responses of L2 participants. Even though a small difference of just 3 more syntagmatic responses, contradicts the hypothesis that the responses of native speakers and of L2 speakers will be predominantly paradigmatic. The data shows that there were no phonetic links made, this fact contradicts the other hypothesis as well, that the L2 speakers may produce more clang responses based on phonological similarities. The three links: syntagmatic, paradigmatic and experiental are almost equivalent with each other, the numbers of responses are almost similar as we can see from tables above: there are 23

experiental links made from L1 participants and 19 from L2 participants; 30 syntagmatic links from L1 and 33 from L2; 27 paradigmatic links from L1 and 23 from L2. The numbers are almost similarly divided into these three categories.

In order to analyze this data more, the results are divided further to compare the L2 participants ability with the lexical link chosen.

Table 9. Lexical links and ability of L2 participants

| Ability | L2 Participants (Total – 75 Word Associations) | | | |
|---|---|---|---|---|
| | Phonetic | Paradigmatic | Syntagmatic | Experiental |
| Low | 0 | 5 | 11 | 3 |
| Middle | 0 | 7 | 7 | 10 |
| High | 0 | 11 | 15 | 6 |
| Total | 0 | 23 | 33 | 19 |

This table shows the number of responses and the level of proficiency of L2 participants.

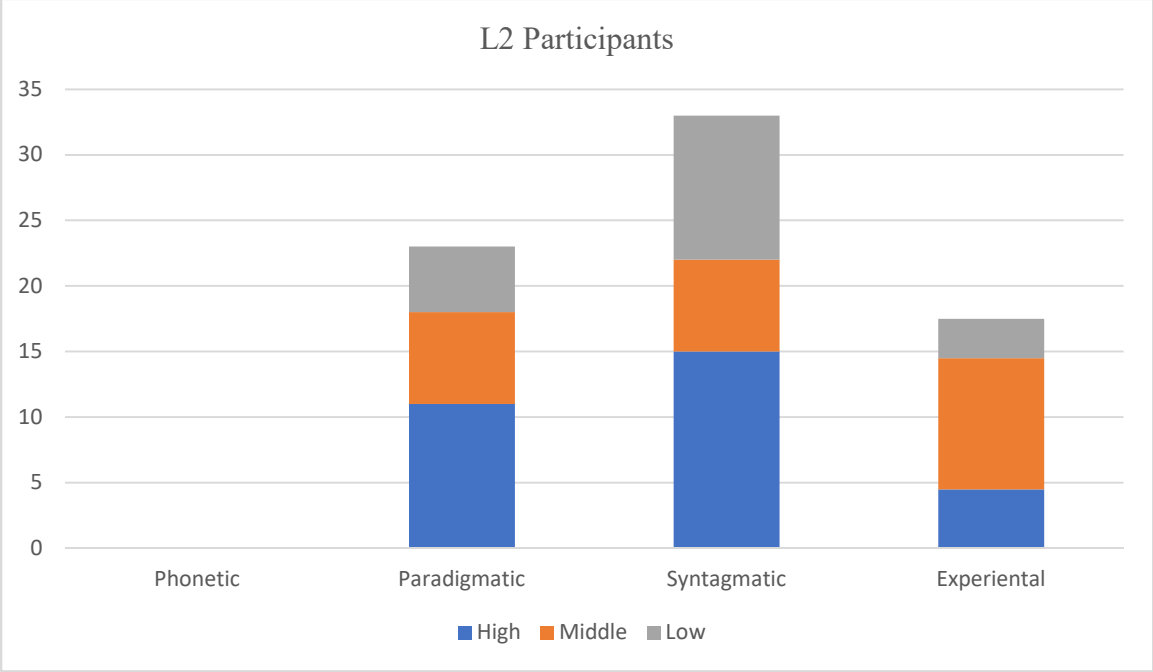


Figure 17. Lexical links and ability of L2

This figure shows the same data as the table above. As we can see in this graph the syntagmatic links is the most common link chosen by L2 participants. 15 syntagmatic associations were made by high level participants, 7 syntagmatic associations by middle level participants and 11 by low level participants. The second most common link was paradigmatic link, with a difference of 10 less responses from that syntagmatic. This doesn't show a huge difference but shows that L2 speakers prefer syntagmatic links.

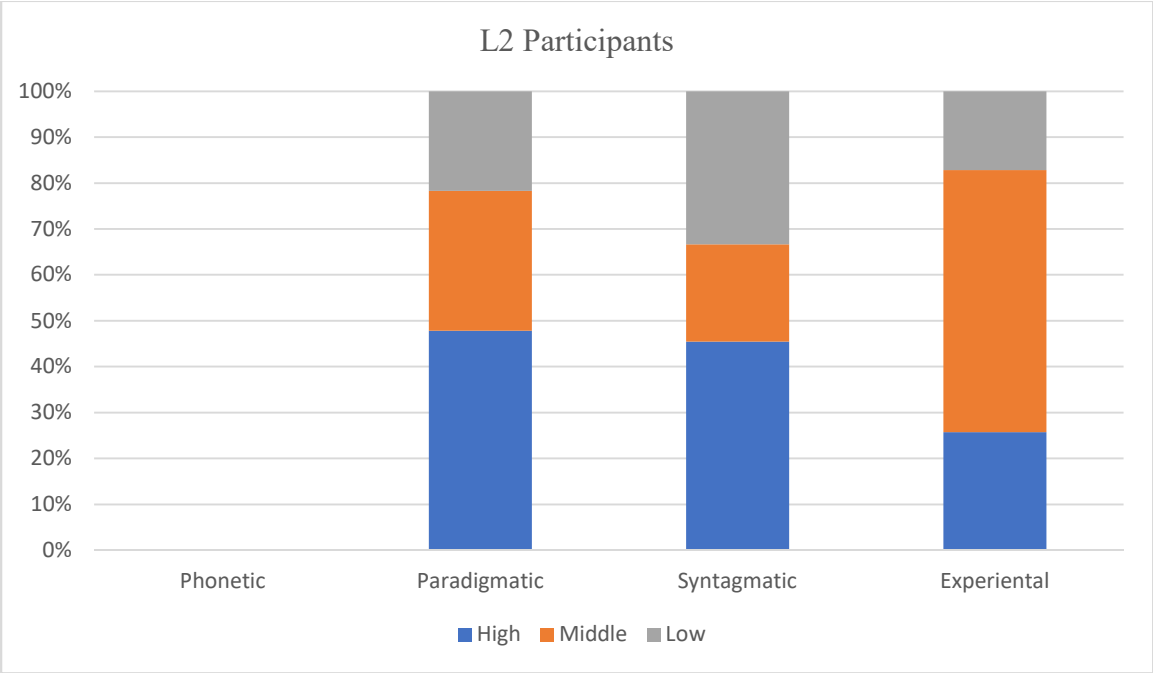


Figure 18. The percentage of response and lexical link

Table 10. Number of Responses and Lexical Link

| Ability | L1 Participants (Total – 80 Word Associations) | | | |
|---|---|---|---|---|
| | Phonetic | Paradigmatic | Syntagmatic | Experiental |
| High | 0 | 27 | 30 | 23 |

Table shows that the number of paradigmatic associations and the syntagmatic associations varies very little, there were just three more syntagmatic responses (paradigmatic associations 27/ syntagmatic associations 30). This contradicts the hypothesis that L1 speakers will make predominantly paradigmatic associations.

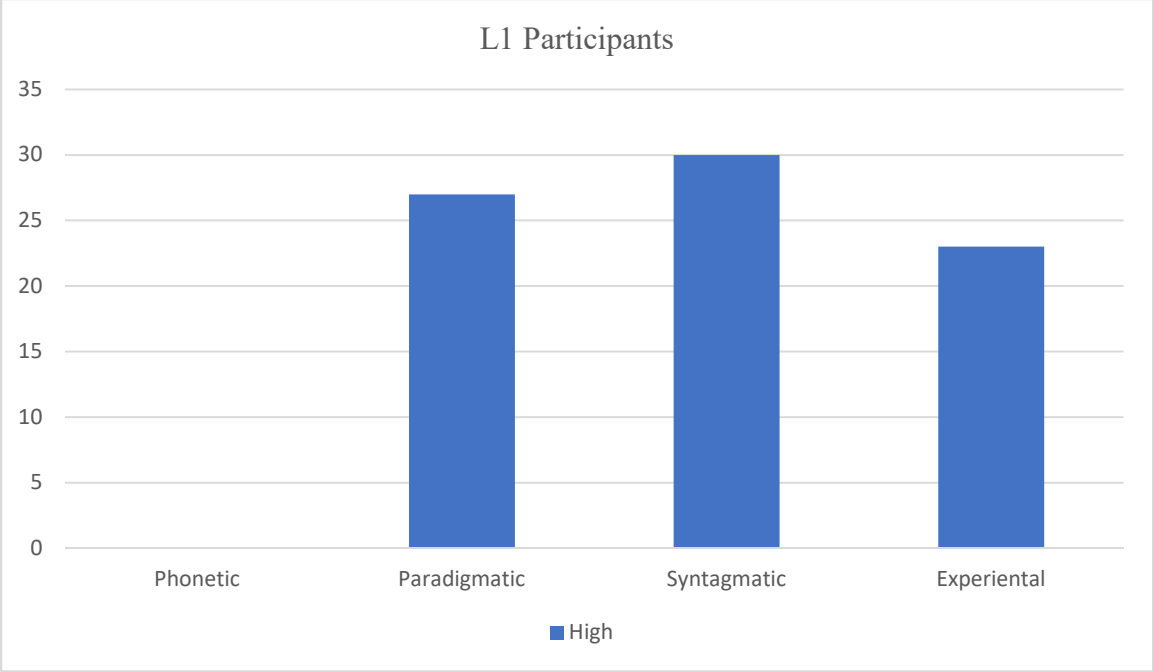


Figure 19. Responses and lexical links of L1 participants

This graph shows that the most common used links by L1 speakers are syntagmatic followed by paradigmatic and experiental.

## 4.2 Results from DIWK

### 4.2.1 L1 DIWK

A great interest of this study was about the effect that DIWK has on patterns of response type. The responses to the stimulus words of L1 and L2 participants were scored according to the VKS criteria. The mean proportion and the total number of responses within each VKS category is given in the tables and figures below.

Table 11. VKS Scores of L1 Participants

| | L1 Participants (80 Responses – Total) | | | | |
|---|---|---|---|---|---|
| | VKS Score (Frequency) | | | | |
| Ability | **1** | **2** | **3** | **4** | **5** |
| High | 4 | 0 | 3 | 2 | 71 |

This table shows the data from the DIWK test and the VKS scores. As we can see L1 participants scored 5 most of the times; from 80 total responses 71 were scored 5, 2 were scored 4, 3 were scored 3, none was scored 2 and 4 were scored 1.

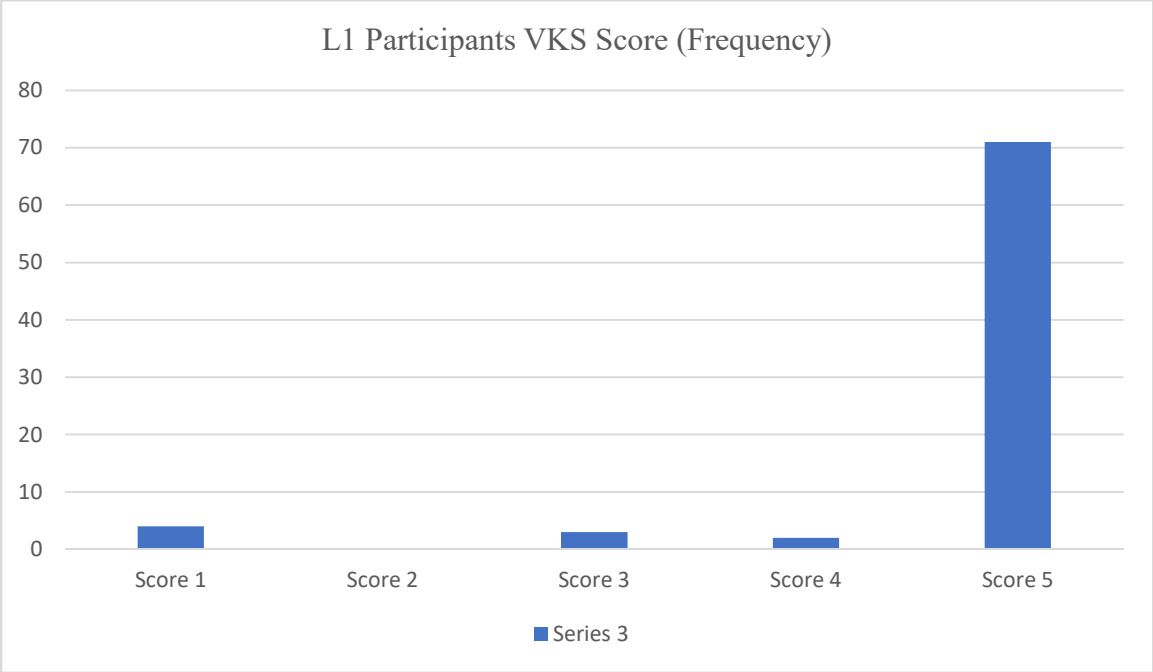


Figure 20. VKS results

This figure shows the same data as the table above, that the majority of L1 participants scored 5.

### 4.2.2 L2 DIWK

Table 12. Data from DIWK Test and Different Abilities of Students

| Ability | L2 Participants (Total – 80 Word Associations) | | | | |
|---|---|---|---|---|---|
| | VKS Score (Frequency) | | | | |
| | **1** | **2** | **3** | **4** | **5** |
| Low | 1 | 1 | 22 | 0 | 0 |
| Middle | 0 | 0 | 7 | 0 | 17 |
| High | 0 | 0 | 2 | 0 | 30 |
| Total | 1 | 1 | 31 | 0 | 47 |

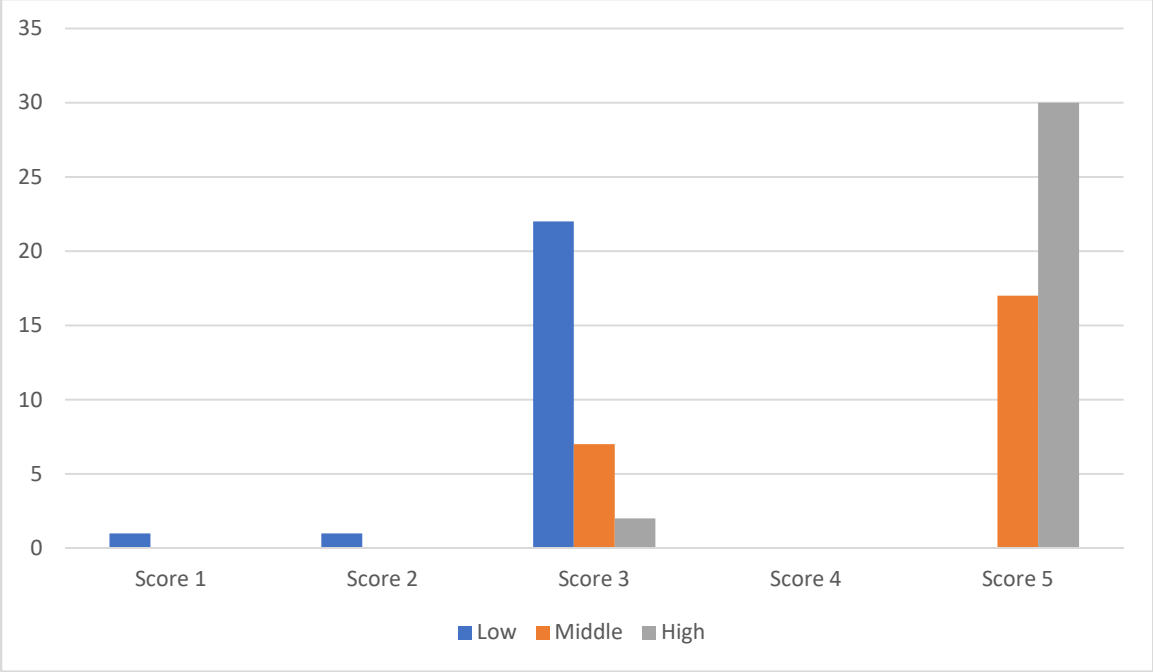


Figure 21. Data from DIWK test and different abilities of students

The table and the graph above show the data from DIWK test and the VKS scores of L2 participants compared to their ability. As we can see most of them scored either 5 or 3. Participants either gave a synonym or translation or used the stimulus word with semantic appropriateness and grammatical accuracy in a sentence and scored 5. 5 was scored mostly by

high ability participants whereas 3 was scored mostly by low ability participants. There were 30 responses from high ability participants that were scored 5, and 17 responses from middle ability participants that were scored 5. No response was scored 4.

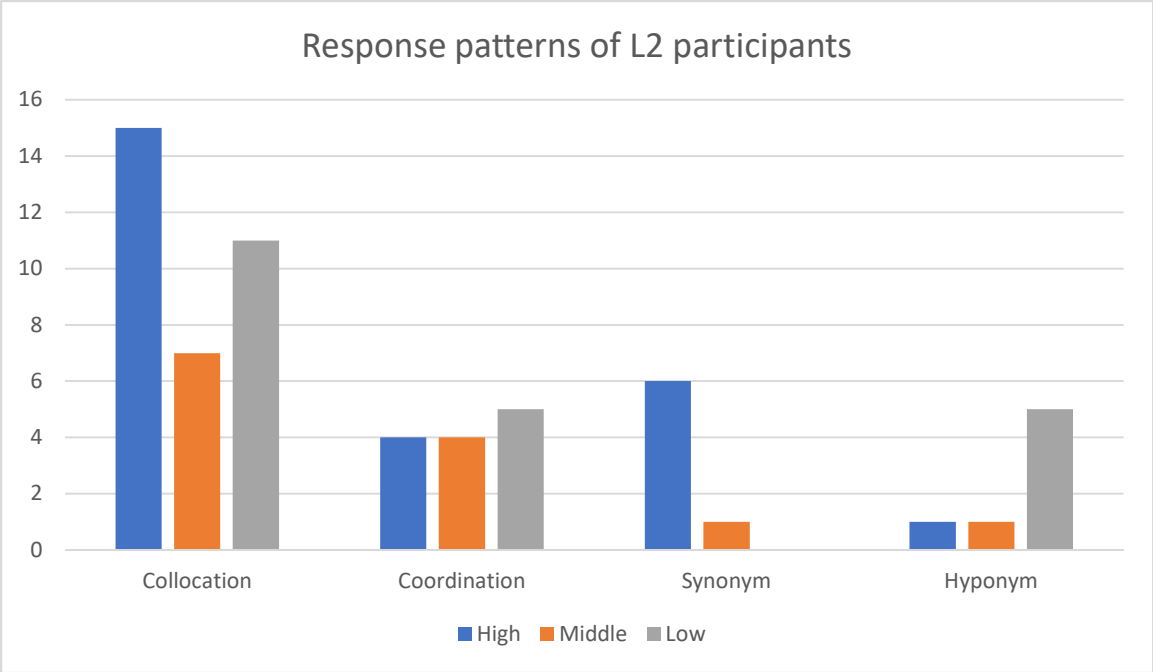


Figure 22. Response patterns of L2 participants

In this figure we can see that the most common word association response for L2 speakers was collocation. High and middle level participants made more collocational links followed by coordination and synonym, whereas low level participants made collocation and coordination links only. The numbers are shown in the table below.

Table 13. Patterns of Responses of L2 Participants

| Ability | L2 Participants (Total – 75 Word Associations) | | | |
|---|---|---|---|---|
| | Patterns of responses | | | |
| | **Collocation** | **Coordination** | **Synonymy** | **Superordinate** |
| Low | 11 | 5 | 0 | 0 |
| Middle | 7 | 4 | 1 | 1 |
| High | 15 | 4 | 6 | 1 |
| Total | 33 | 13 | 7 | 2 |

According to McCarthy 1990 the most common word association link for L1 participants is coordination followed by collocation, hyponymy and synonymy. But as we can see from the figure below, the findings of this study show that the most common link is collocation, even though with a little difference.

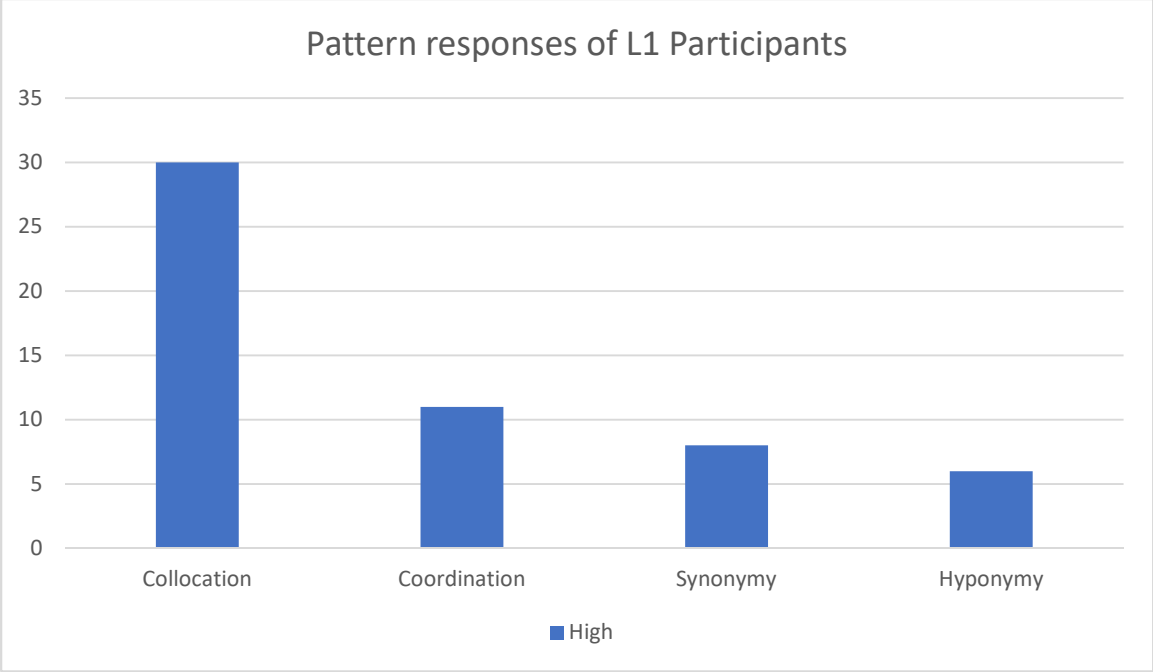


Figure 23. Pattern responses of L1 participants

Table 14.Pattern responses of L1 participants

| Ability | L1 Participants (Total – 80 Word Associations) | | | |
|---|---|---|---|---|
| | Patterns of responses | | | |
| | **Collocation** | **Coordination** | **Synonymy** | **Superordination** |
| High | 30 | 11 | 8 | 6 |

This table shows the number of responses of different patterns. It shows that 25 responses of L1 participants were paradigmatic, whereas 30 were syntagmatic. In paradigmatic links are 11 coordinations, 8 synonyms and 6 hyponyms.

## 4.3 DISCUSSION OF RESULTS

The results of this study weren't strongly relevant to the hypothesis. The first unexpected finding is that neither natives or L2 speakers made phonological associations. It was expected that L2 participants with low level of proficiency will produce more clang responses based on phonological similarities, but there were no phonological links by none of the groups. Based on results of past research it was also expected that the responses of native speakers and of L2 speakers will be predominantly paradigmatic, but both of the groups made more syntagmatic links than paradigmatic even though with a small difference.

Another unexpected finding was that native speakers made more collocational associations than coordination as it was expected that most of the native speakers will involve co-ordination followed by collocation, super ordination and synonymy.

No predictions were made about experiential links, but both L1 and L2 participants achieved a high frequency of experiential responses. Both of the groups responded based on their personal knowledge about the stimulus word. L2 low ability participants made 3 experiantial links, middle ability 10 and high ability 6. In total L2 participants made 19 experiential links whereas native speakers made 23 experiantial links. So, native speakers made more experiential links than L2 participants.

The word association test and the depth of word knowledge test show that both L1 and L2 participants have a higher proportion of syntagmatic links followed by paradigmatic and experiential. 39% of the responses of both groups were syntagmatic, 31% were paradigmatic, and 26% were experiential. L1 participants responses were all categorized, whereas 5 responses of L2 participants were uncategorized.

Meara from his past studies claims that phonology has an important role in the organization of the L2 mental lexicon, and it was expected that L2 participant will make more phonological links but they didn't. The WAT was understandable for both groups but I cannot say the same for DIWK. For example, low level participants have understood the WAT but they weren't able to respond correctly in DIWK and to score high. Whereas, middles ability participants had a clear understanding of DIWK and most of them scored 5. High ability participants and native speakers, as it may be expected, all had high scores.

Since L1 participants had different levels of proficiency, some of them have a mental lexicon that is in the beginning level of development, so, they caused some differences in response with native speakers. In general, findings show that L1 mental lexicon and L2 mental lexicon have some soft differences between them even if them may be similar. Both of groups have made the same three semantic links with almost the same number, 33/30 syntagmatic, 23/27 paradigmatic, and 19/23 experiantial. I think that these findings tell about e similar mental lexicon.

## 4.4 DIWK RESULTS

From all 160 responses of both groups, 118 were scored 5, which means that the word is used with semantic appropriateness and grammatical accuracy in a sentence. 71 responses were from native speakers, 30 were from high level L2 participants, and 17 were from middle level L2 participants. So, most of the respondents scored 5, the majority of native speakers and the majority of high and middle level L2 respondents. It was expected that low level participants will score 1, but there was just one response of L2 participant that achieved a score of 1, and 22 responses of low level with the score 3 with syntagmatic, paradigmatic and experiential links. The surprising finding is that were 4 missing responses from the group of native speakers in the DIWK, but I believe that they accidentally didn't answer because they skipped the word and forgot to answer and not because they didn't know the word.

It is suggested that depth of word knowledge is related to the types of patterns of responses for both groups natives and L2 speakers, for example paradigmatic responses show a high degree of lexical development and have a higher score in VKS than syntagmatic responses and other patterns. But, to prove this, researchers have to do a deep research through a period of time and to assess words from being unknown to well known as shown in the Figure 10.

# CHAPTER 5

## 5 CONCLUSION

This study similarly to other previous studies in this field, attempted to attain a better understanding of the L1 and L2 mental lexicon. Some of the previous studies support a similar L1 and L2 mental lexicon, whereas some studies support the idea that L1 and L2 mental lexicon have huge differences. The aim of this study was to explore L1 and L2 mental lexicon and to find out if they have similar structure. This study had five hypotheses. The first hypothesis that both L1 and L2 speakers go through the same process when they attempt to find the words they need to use, is proven based on the links participants made in the WAT and the scores of the DIWK. Both of the groups preferred the same links at the same degree, and most of the respondents scored five in the DIWK test, including participants with middle level of English. The second hypothesis that the L1 and L2 lexicon are structurally the same is proven based on the same results mentioned above. The results suggest that L1 and L2 mental lexicon are not structurally different, but the L2 mental lexicon is simply at an earlier stage of development, because based on the results of the DIWK test, middle and low ability participants had lower scores than natives and advanced speakers, which means that they made similar links with natives, and they understood the words, but didn't know to use the words with semantic appropriateness and grammatical accuracy in a sentence. So, they find the words in the mental lexicon in the same way as natives, but some of them have less knowledge about the words than natives have. The third hypothesis that the responses of native speakers and of L2 speakers will be predominantly paradigmatic is disproven based on the fact that both of the groups made more syntagmatic links than paradigmatic, even though with a small difference. The fourth hypothesis that most of the native speakers will involve co-ordination followed by collocation, super ordination and synonymy is disproven based on the results of the WAT which show that native speakers made more collocational associations. The last hypothesis that L2 speakers with low level of competence may produce more clang responses based on phonological similarities is disproven because L2 participants with low level of English didn't produce any clang responses.

Some of the hypothesis were disproven because based on previous research it was expected that participants would prefer different associations than they did, for example more paradigmatic links than syntagmatic. Nevertheless, both of the groups had similar preferences; they preferred syntagmatic links to paradigmatic links with a small difference.

To conclude, the findings show that both L1 and L2 speakers use similar methods to find the words they need to use and they prefer similar links, that of syntagmatic, paradigmatic and experiential. The findings from word association test show that both groups prefer syntagmatic links and paradigmatic links followed by experiential, and none of the groups made phonological links. From the findings of DIWK we can see that almost all native speakers scored 5, whereas half of the L2 participants scored 5 and half of them scored 3. All this suggests that L1 and L2 mental lexicon are not structurally different, but the L2 mental lexicon is simply at an earlier stage of development.

## 5.1 IMPLICATIONS, LIMITATIONS AND RECOMMANDATIONS

When I chose this topic for my thesis, my plan was to explore the mental lexicon of primary school children. A group of Albanian native speakers who learn English as a second language from a primary school in my city, and a group of English native speakers from a primary school in America were going to be the participants of my study. But after that plan failed, I decided to do it with adults. I suggest to other researchers to do this experiment with children of different ages and different levels, because children provide valuable insight to the mental lexicon, and they provide varied and interesting data.

I also suggest to conduct the study personally and not through the internet as I did, in order to give more explanations and to make it possible for the participants to explain their responses, in order to have less uncategorized responses and no responses.

Despite of limitations and implications, I have gained valuable data from this study that shows the similarities and differences of L1 and L2 mental lexicon and the way that participants find the word they want to use when they need them.

# CHAPTER 6

## 6 BIBLIOGRAPHY


Aitchison, J. (2012). *Words in the Mind: An Introduction to the Mental Lexicon.* New Jersey: John Wiley & Sons.

Aitchison, J. (2012). *Words in the Mind: An Introduction to the Mental Lexicon.* New Jersey: John Wiley & Sons.

Aitchison, J. (2012). *Words in the Mind: An Introduction to the Mental Lexicon.* John Wiley & Sons.

Barrow, S. (2011, September). *First and second language word association.* Retrieved from University of Birmingham : https://www.birmingham.ac.uk/documents/college-artslaw/cels/essays/appliedlinguistics/sarahbarrowdiss.pdf

Bonin, P. (2004). *Mental Lexicon: Some Words to Talk about Words.* New York: Nova Publishers.

Bruton, A. (2009). The vocabulary knowledge scale: A critical analysis. *Language Assessment Quarterly* , 288-297. Retrieved from Educational Resources Information Center (ERIC): https://eric.ed.gov/?id=EJ867001

Carter, R. (1998). *Vocabulary: Applied Linguistic Perspectives.* London: Routledge.

Clark, E. V. (1995). *The Lexicon in Acquisition.* New York: Cambridge University Press.

Cook, V. (2003). *Effects of the Second Language on the First.* Sydney: Multilingual Matters LTD.

Cowie, A. P. (2009). *Semantics.* New York: Oxford University Press.

Diller, K. C. (1978). *The language teaching controversy.* Newbury House Publishers.

Firth, J. R. (1957). *Studies in Linguistic Analysis.* Blackwell.

Gass, S. M., & Selinker, L. (1994). *Second Lanugage Acquisiton.* London: Lawrence Erlbaum Associates.

Guasti, M. T. (2004). *Language Acquisition: The Growth of Grammar.* London: The MIT Press.

Jarema, G., & Libben, G. (2007). *The Mental Lexicon: Core Perspectives.* WA: Emerald Group Publishing Limited .

Joshi, M. (2014). *Hypernyms and Hyponyms: Vocabulary Building.*

Kormos, J. (2011). *Speech Production and Second Language Acquisition.* New York: Routledge.

Lengyel, Z., & Navracsics, J. (2007). *Second Language Lexical Processes: Applied Linguistic and Psycholinguistic Perspectives.* Bristol: Multilingual Matters.

Lesser, R., & Milroy, L. (2014). *Linguistics and Aphasia: Psycholinguistic and Pragmatic Aspects of Intervention.* New York: Routledge.

McCarthy, M. (1990). *Vocabulary.* New York: Oxford University Press.

McCarthy, M., & O'Dell, F. (2006). *English Collocations in Use: How Words Work Together for Fluent and Natural English ; Self-study and Classroom Use.* Cambridge University Press.

Meara, P. (1983). *Word Associations in a Foreign Language*. Retrieved from _lognostics: http://www.lognostics.co.uk/vlibrary/meara1983.pdf

Meisel, J. M. (2011). *First and Second Language Acquisition: Parallels and Differences.* New York: Cambridge University Press.

Müller, S. (2008). *The Mental Lexicon.* GRIN Verlag.

Palmer, F. R. (1981). *Semantics.* New York: Cambridge University Press.

Pavlenko, A. (2009). *The Bilingual Mental Lexicon: Interdisciplinary Approaches.* Toronto: Multilingual Matters.

Piper, T. H., & Leicester, P. F. (1980). *Word association behavior as an indicator of English language.* Retrieved from Educational Resources Information Center (ERIC): https://eric.ed.gov/?id=ED227651

Postman, L., & Keppel, G. (1970). *Norms of Word Association.* New York: Academic Press.

Poulisse, N. (1999). *Slips of the Tongue: Speech Errors in First and Second Language Production.* Amsterdam: John Benjamins Publishing.

Ransdell, S. E., & Fischler, I. (1987). Memory in a monolingual mode: When are bilinguals at a disadvantage? *Journal of Memory and Language*, 400.

Saeed, J. I. (1997). *Semantics.* Blackwell Publishers.

Singleton, D. (1999). *Exploring the Second Language Mental Lexicon.* New York: Cambridge University Press.

Webster, M. (1984). *Merriam-Webster's Dictionary of Synonyms.* Springfield: Merriam-Webster, Inc.

Wilson, W. M., & Tyler, L. K. (1980). *The temporal structure of spoken language understanding.* Netherlands.

Wolter, B. (2001). Comparing the L1 and L2 mental lexicon: A depth of individual word knowledge. *Studies in Second Language Acquisition*, 41-69.

# 7 APPENDICES

## 7.1 APPENDIX ONE PRELIMINARY TESTING

# Word Association Test

This is a word association test that I need for my study, could you please take a minute and complete the test. Please write down the first word that you think of after reading each of the following stimulus words:

**Out**

_____

**Towel**

_____

**Lullaby**

_____

**Flower**

_____

**Cheap**

_____

**Heart**

_____

**False**

_____

**Forest**

_____

**Burn**

_____

**See**

_____

Name: _____

Age: _____

Sex: Female/ Male

What is your first language?

_____

What is the level of your English?

Beginner / Intermediate / Advanced

# Depth of vocabulary test

This is a depth of vocabulary test to measure the knowledge that you have about the stimulus words. Please read the words and select one or more options below.

**Out**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

**Towel**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**Lullaby**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**Flower**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**Cheap**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**Heart**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**False**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**Forest**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**Burn**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**See**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

## 7.2 APPENDIX TWO FINAL TESTING

# Word Association Test

This is a word association test that I need for my study. In this test you will find a list of simple words, please read each word and then write down the first word that comes to your mind. Write your response in the space provided under each word. For example, if the word is book, the first word you think of might be read or page. Thank you very much for your cooperation.

**Between**

_____

**Kitchen**

_____

**Extinct**

_____

**Sheep**

_____

**Ugly**

_____

**Religion**

_____

**Drive**

_____

**Happy**

_____

Name: _____

Age: _____

Sex: Female/ Male

What is your first language?

_____

What is the level of your English?

Beginner / Intermediate / Advanced

# Depth of vocabulary test

This is a depth of vocabulary test to measure the knowledge that you have about the stimulus words. This time you will be asked to rate each word you read on how well you know it. Please read the words and answer accurately. For options c and d you can use an English synonym or an Albanian translation.

**Between**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don't know what it means.

c) I have seen this word before, and I think it means. (provide a synonym or translation)

d) I know this word. It means. (provide a synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

**Kitchen**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**Extinct**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**Sheep**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**Ugly**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**Religion**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**Drive**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

| |
|---|
| |

**Happy**

a) I don't remember having seen this word before.

b) I have seen this word before, but I don’t know what it means.

c) I have seen this word before, and I think it means. (synonym or translation)

d) I know this word. It means. (synonym or translation)

e) I can use this word in a sentence: (Write a sentence). (If you do this section, please do section d.)

Please write the answers for c, d, e here

## 7.3 APPENDIX THREE RESULTS

| Stimulus word: between | | | | |
|---|---|---|---|---|
| **L2 Participants** | | | | |
| **Response** | **Low Ability** | **Middle Ability** | **High Ability** | **Link** |
| Us | 1 | 1 | 1 | Syn/ Coll |
| Space | 1 | | | Syn/ Coll |
| Among | | 1 | 1 | Par/ Syn |
| Middle | | | 1 | Par/ Syn |
| Friends | | | 1 | Syn/ Coll |
| Me and you | | 1 | | Syn/ Coll |

6SYN 3 PAR

| Stimulus word: between | | |
|---|---|---|
| **L1 Participants** | | |
| **Response** | **High Ability** | **Link** |
| Us | 3 | Syn/ Coll |
| Middle | 2 | Par/ Syn |
| Sandwich | 1 | Exp |
| Edges | 1 | Syn/ Coll |
| Inside | 1 | Par/ Coo |
| In | 1 | Par/ Coo |
| Under | 1 | Par/ Coo |

4SYN 5PAR 1EXP

| Stimulus word: kitchen | | | | |
|---|---|---|---|---|
| **L2 Participants** | | | | |
| **Response** | **Low Ability** | **Middle Ability** | **High Ability** | **Link** |
| Food | 1 | 1 | 2 | Exp |
| Lunch | 1 | | | Exp |
| Meal | | | 1 | Exp |
| Dishes | | 1 | | Par/ Coo |
| Cake | | 1 | | Exp |
| Table | 1 | | 1 | Syn/ Coll |

2SYN 1PAR 7EXP

| Stimulus word: kitchen | | |
|---|---|---|
| **L1 Participants** | | |
| **Response** | **High Ability** | **Link** |
| Food | 1 | Exp |
| Eat | 1 | Exp |
| Cooking | 2 | Exp |
| Sink | 1 | Syn/ Coll |
| Knife | 1 | Syn/ Coll |
| Counter | 2 | Par/ Hyp |
| Room | 1 | Par/ Hyp |
| Table | 1 | Syn/ Coll |

4EXP 3SYN 3 PAR

| Stimulus word: extinct | | | | |
|---|---|---|---|---|
| **L2 Participants** | | | | |
| **Response** | **Low Ability** | **Middle Ability** | **High Ability** | **Link** |
| Dinosaurs | | 1 | | Exp |
| Children | 1 | | | Uncategorized |
| Dragons | | 1 | | Exp |
| Volcano | | | 1 | Exp |
| Vanished | | | 1 | Par/ Syn |
| Disappear | | | 1 | Par/ Syn |
| Language | | | 1 | Syn/ Coll |
| Members | 1 | | | Uncategorized |
| Lost | | 1 | | Par/ Syn |

3EXP 3 PAR 1 SYN

| Stimulus word: extinct | | |
|---|---|---|
| **L1 Participants** | | |
| **Response** | **High Ability** | **Link** |
| Dinosaurs | 6 | Exp |
| Gone | 2 | Par/ Syn |
| Animal | 1 | Syn/ Coll |
| Dead | 1 | Par/ Syn |

6EXP 3 PAR 1 SYN

| Stimulus word: sheep | | | | |
|---|---|---|---|---|
| **L2 Participants** | | | | |
| **Response** | **Low Ability** | **Middle Ability** | **High Ability** | **Link** |
| Wolf | 1 | 1 | | Par/ Coo |
| Field | | 1 | | Exp |
| Harvest | | | 1 | Exp |
| Fur | | | 1 | Syn/ Coll |
| Animal | | 1 | 1 | Par/ hyp |
| Wool | 1 | | | Syn/ Coll |
| Black sheep | | | 1 | Syn/ Coll |

2EXP 4PAR 3 SYN

| Stimulus word: sheep | | |
|---|---|---|
| **L1 Participants** | | |
| **Response** | **High Ability** | **Link** |
| Meat | 3 | Syn/ Coll |
| Lamb meat | 1 | Exp |
| Wool | 1 | Syn/ Coll |
| Animal | 1 | Par/ Hyp |
| Mammal | 1 | Par/ Hyp |
| Milk | 1 | Syn/ Coll |
| Goat | 1 | Par/ Coo |
| Cow | 1 | Par/ Coo |

1EXP 5 SYN 4 PAR

| Stimulus word: ugly | | | | |
|---|---|---|---|---|
| **L2 Participants** | | | | |
| **Response** | **Low Ability** | **Middle Ability** | **High Ability** | **Link** |
| Bag | 1 | | | Syn/ Coll |
| Witch | | 1 | | Syn/ Coll |
| Person | | | 1 | Syn/ Coll |
| Bad | | | 1 | Par/ Syn |
| Truth | | | 1 | Syn/ Coll |
| Face | | 1 | 1 | Syn/ Coll |
| Dress | 1 | | | Syn/ Coll |
| Beautiful | | 1 | | Par/ Coo |
| Pretty | 1 | | | Par/ Coo |

7SYN 3 PAR

| Stimulus word: ugly | | |
|---|---|---|
| **L1 Participants** | | |
| **Response** | **High Ability** | **Link** |
| Bad impression | 1 | Exp |
| Bad | 1 | Par/ Syn |
| Duckling | 1 | Exp |
| Gross | 1 | Par/ Coo |
| Situation | 1 | Syn/ Coll |
| Sweater | 1 | Syn/ Coll |
| Beautiful | 1 | Par/ Coo |
| Pretty | 1 | Par/ Coo |

| | | |
|---|---|---|
| Unattractive | 1 | Par/ Syn |
| Truth | 1 | Syn/ Coll |

2EXP 5PAR 3SYN

| **Stimulus word: religion** | | | | |
|---|---|---|---|---|
| **L2 Participants** | | | | |
| **Response** | **Low Ability** | **Middle Ability** | **High Ability** | **Link** |
| God | 1 | 1 | | Exp |
| Faith | | | 3 | Par/ Coo |
| Mosque | | 1 | | Exp |
| Trust | 2 | | | Par/ Coo |
| Pray | | 1 | | Exp |
| Muslim | | | 1 | Syn/ Coll |

4EXP 5PAR 1 SYN

| **Stimulus word: religion** | | |
|---|---|---|
| **L1 Participants** | | |
| **Response** | **High Ability** | **Link** |
| Peace | 4 | Exp |
| Christianity | 1 | Exp |
| God | 1 | Exp |
| Catholic | 1 | Syn/ Coll |
| Belief | 2 | Par/ Coo |
| Islam | 1 | Exp |

7EXP 1SYN 2 PAR

**Stimulus word: drive**

**L2 Participants**

| Response | Low Ability | Middle Ability | High Ability | Link |
|---|---|---|---|---|
| Car | 3 | 2 | 1 | Syn/ Coll |
| Fast | | | 1 | Syn/ Coll |
| Travel | | | 1 | Par/ Coo |
| Road | | 1 | | Exp |
| Through | | | 1 | Syn/ Coll |

8SYN 1EXP 1PAR

**Stimulus word: drive**

**L1 Participants**

| Response | High Ability | Link |
|---|---|---|
| Safe | 3 | Syn/ Coll |
| Car | 5 | Syn/ Coll |
| Free | 1 | Syn/ Coll |
| Vehicle | 1 | Exp |

9SYN 1EXP

**Stimulus word: happy**

**L2 Participants**

| Response | Low Ability | Middle Ability | High Ability | Link |
|---|---|---|---|---|
| Family | 1 | | | Syn/ Coll |
| Love | | 1 | | Exp |
| Graduated | | | 1 | Exp |

| | | | | |
|---|---|---|---|---|
| Pleased | | | 1 | Par/ Syn |
| Feeling | | | 1 | Syn/ Coll |
| Smile | | 1 | | Syn/ Coll |
| Face | 1 | | 1 | Syn/ Coll |
| Smiling | | 1 | | Par/ Coo |
| Sad | 1 | | | Par/ Coo |

5SYN 2 EXP 3PAR

| **Stimulus word: happy** | | |
|---|---|---|
| **L1 Participants** | | |
| **Response** | **High Ability** | **Link** |
| Mood | 1 | Syn/ Coll |
| Art | 1 | Exp |
| Content | 1 | Par/ Syn |
| Sad | 2 | Par/ Coo |
| Birthday | 1 | Syn/ Coll |
| Emotion | 1 | Par/ Hyp |
| Life | 1 | Syn/ Coll |
| Exciting | 1 | Par/ Syn |
| Ending | 1 | Syn/ Coll |

4SYN 1 EXP 5 PAR