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The effect of different vocabulary teaching interventions on ESL learners' word association behaviour

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Laetitia Machart BEd

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Univ.-Prof. Mag. Dr. Julia Hüttner MSc

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1. Introduction

As a young English teacher, I have yet to discover how much lesson time one can or should spend on deliberate vocabulary teaching. What is more, there is an uncertainty of how much dealing with vocabulary items actively helps learners to develop their mental lexicon and, thereby, their language proficiency. Furthermore, it is of interest, what kind of vocabulary teaching method leads to the most changes in word association in terms of language proficiency (Fitzpatrick & Thwaites, 2020).

The present master's thesis deals with the effect of different vocabulary teaching interventions on ESL learners' word association behaviour. It is, therefore, an aim of this thesis to find out more about the connection of vocabulary learning, the mental lexicon, and word associations. In order to reach this aim, a pre-test/post-test design study with a word association test conducted before and after three different teaching interventions, each administered in a different group of ESL learners, who are ninth and tenth grade students at a vocational upper secondary school in Lower Austria, is undertaken.

This thesis is structured as follows: The first chapter deals with the relevant concepts and theoretical background information necessary for understanding and dealing with vocabulary teaching and word association testing. The subsection on vocabulary discusses what words are and how they can be related to each other. After that, there is an explanation of the mental lexicon and its relationship with second language proficiency and second language acquisition before the concept of word association is introduced and the way it can be tested and what can be found out about it are dealt with. At the end of the literature review, considerations about how vocabulary can be taught and acquired are made. Subsequently, the design of the present research project including information on participants, data collection, and data analysis, is described. In chapter three, the word association test used in this project is presented and after that, the three teaching interventions are summarised. Afterwards, the results are presented in chapter five before they are discussed in the context of the research questions. Finally, there is a conclusion of the research project.

1. Literature review

1.1. Vocabulary

In order to understand what vocabulary is, there are several descriptions and definitions, which differ in detail. A very basic explanation of vocabulary knowledge is provided by Ma (2009: 27): Vocabulary knowledge is “knowing the meaning of the word and how to use it appropriately in different contexts”. Vocabulary is also a term regularly used in language teaching to refer to a skill, or even “the biggest component of any language course” (McCarthy, 1990: vii). Language learners require vocabulary to communicate meaningfully; however, it is also a rather vague and somewhat blurry aspect of language learning and teaching. Lightbown and Spada (2013: 60) argue that vocabulary is the most important aspect for successful communication, which is still possible without other aspects such as syntax, pronunciation, or grammar. Even though vocabulary and grammar can be viewed as a combined area of language knowledge, “lexical competence is often considered more important than syntactic knowledge in achieving effective communication” (Qian & Lin, 2020: 66). According to McCarthy (1990: 3), the vocabulary of a language are essentially the words used in that language. However, vocabulary cannot simply be considered a list of words stored in either the human brain, a coursebook, or a dictionary, as it does not only contain individual words of a language, but also combinations of those words, relations between those words, and various information about those words (McCarthy, 1990; Lightbown & Spada, 2013).

More than words

On the word level, one can already find various morphemes that are part of words: A word can either consist of just one morpheme, or “*roots*, such as ‘laugh’, ‘make’, ‘box’, and ‘window’ which cannot be further subdivided” [original emphasis] or it can also contain prefixes or suffixes, which make the word into a derived word (McCarthy, 1990: 4). And there are also compound words that are combinations of words that mean something different than the individual words in them; McCarthy (1990: 4) provides the following examples: “‘make-believe’, ‘window-dressing’, and ‘jack-in-the-box’”. These compounds will be dealt with in more detail later on.

If we zoom out from the word level and consider making an utterance, word choices have to be made depending on the context. In these vocabulary decisions, there are always

options that are not used when deciding on a word to say or write. Therefore, there are oftentimes other words that could have been used instead of a word which might even have a similar meaning or function in a sentence and would supposedly also, at least to some degree, work in an utterance or sentence. McCarthy (1990: 16) argues that these options ought to be related in some way and provides the following example:

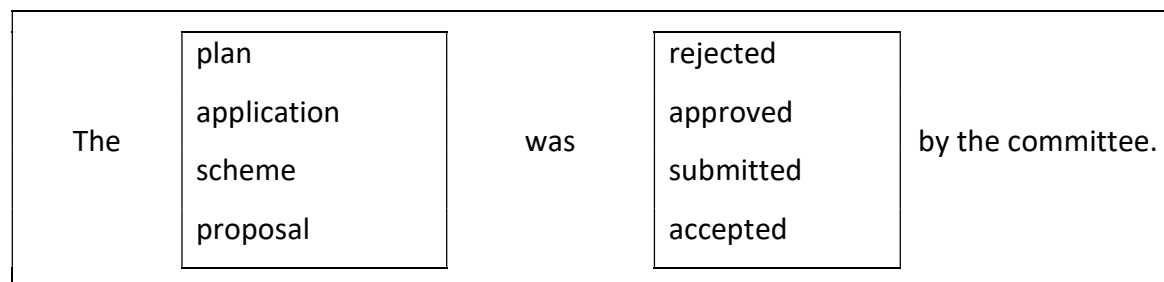


Figure 1: Syntagmatic and paradigmatic relationships (McCarthy, 1990: 16)

The two boxes in Figure 1 each contain four different words as vocabulary options in two different positions in a sentence. Each of the words in the first box collocates with each of the words in the second box, this collocational relationship is known as syntagmatic relationship (McCarthy, 1990: 16). The syntagmatically related words can be used together in a sentence. Moreover, the four items within each box are also related to each other. In this case, the relationship is paradigmatic, which means that they can be used in the same position of a sentence, even though they do not necessarily mean exactly the same thing (McCarthy, 1990: 16).

Vocabulary items related to each other paradigmatically can, in turn, be related to each other in three different ways, when taking their meaning into account: synonymy, antonymy, and hyponymy, which can be considered the sameness, oppositeness, and inclusion of words (Yule, 2010: 117). According to McCarthy (1990: 16), these three types of word relationships are the most frequent ones one comes across in language teaching. Synonyms are widely known as words that mean the same thing. Most likely, however, there are no two words that truly have the exact same meaning in the same context (Yule, 2010: 117). Words may be close in meaning, but might still have some different characteristics: They may not collocate with the same items, show different syntactic behaviour, belong to different contexts, be used in different geographical areas, be more or less archaic or modern (McCarthy, 1990: 17). Antonymy, on the other hand, is the oppositeness of two words. This oppositeness can either be of an ungradable nature, like 'alive' and 'dead', where there are no terms in between, or of a gradable nature, as for

example 'hot' and 'cold', where there is a spectrum between the two extremes that can be expressed in intermediate terms (McCarthy, 1990: 17-18). Finally, hyponymy is "the relationship of inclusion, [which] organizes words in *taxonomies*, or hierarchical tree-type diagrams", in which, for instance, "'car' is said to be a *hyponym* of 'vehicle', while 'vehicle' is the *superordinate* term [and] '[c]ar', 'van', and 'lorry' [...] are called *co-hyponyms*", which make up a "*lexical set*" (McCarthy, 1990: 19) [original emphases]. Broader than the term of the lexical set is the lexical field, which includes all the words in such a taxonomy (McCarthy, 1990: 19). McCarthy (1990: 19) mentions the potential helpfulness of hyponymy for language teaching and learning, as it is a means of organising vocabulary items, which is already done by many coursebooks that present vocabulary items in lexical fields.

Nouns, in particular, can also be related to other nouns in a layered way, which can be described as one word being a kind of another word and which is a special form of a hyponymous relationship. Aitchison (2012: 123) provides an impressive example: "a Shetland pony is also a pony, a horse, an equid, an odd-toed ungulate, a herbivore, a mammal, a vertebrate, an animal, an organism and an entity - eleven levels." To understand the levels, they can each be described by explaining that "a Shetland pony is a kind of pony, a pony is a kind of horse, and so on." And another way nouns can be related is similar to the layers, but here, one noun is a part of the other noun (Aitchison, 2012: 123). This relationship is called meronymy and it is a relationship where, for example, a school bag contains books, a notepad, and a pencil case, therefore, the books, the notepad, and the pencil case are part of the school bag. This can be further continued by saying that pages are part of a book (or in the previously mentioned case also of the notepad) or that pens, pencils, erasers, and rulers are part of the pencil case and that the lid and the ink are part of the pen.

In spoken as well as written texts, we can find several words that regularly occur together, which are multi-word units and they are also known as fixed forms (McCarthy, 1990: 6). McCarthy (1990: 6-11) mentions various types of these multi-word units, for example, idioms, binomials, and trinomials. He explains idioms by calling an idiom "a fossilized chunk of language", as there are finite possibilities of how a language user can use it (1990: 6). Therefore, idioms are set combinations of words that have meanings beyond the individual

words' meanings and cannot be broken up in any way. Even though those idioms consist of several words, McCarthy suggests considering them as individual vocabulary items, which he also mentions when explaining binomials (1990: 8). The latter are "pairs [...] of words which display fixed membership and sequence", as for example, "'back to front'", "'fish and chips'", or "'ladies and gentlemen'" (McCarthy, 1990: 8). What ought to be noted is that these binomials, in spite of their name, actually consist of three words, but the conjunctions are not counted, only the content words. In addition to binomials, there are also some trinomials like "'cool, calm, and collected'" or "'morning, noon, and night'" in the English language, consisting of three content words used together (McCarthy, 1990: 8).

Formulaic language

McCarthy's (1990) view of these multi-word units appears to be dated, as Wray (2000: 463) argues that understanding and knowing "idiomatic forms of expression, including idioms, collocations, and sentence frames" is essential for successfully learning a language and she calls these types of expression "formulaic sequences". More recently, Wood (2020: 30) defines formulaic language as "multiword language phenomena which holistically represent a single meaning or function" and they are probably processed in the mind as items like single words and he also refers to them as formulaic sequences.

Since there are so many different types and phenomena, which might be put under the umbrella-term formulaic language, Wray (2000: 465) defines formulaic sequences in the following way:

"a sequence, continuous or discontinuous, of words or other meaning elements, which is, or appears to be, prefabricated: that is, stored and retrieved whole from memory at the time of use, rather than being subject to generation or analysis by the language grammar."

McCarthy (1990: 12) defined such collocational relationships as relationships between words that are usually used together or can be combined more naturally than others and describes collocation as "a marriage contract between words [...] [and] an important organising principle in the vocabulary of any language" (1990: 12). But the term collocation is sometimes used rather liberally for any type of multi-word unit; however, precisely speaking, "a collocation is a function of the frequency of a word appearing in a certain lexical context as compared to its frequency in language as a whole" (Wood, 2020: 31). The

reason why collocations are produced is that they are words used together syntagmatically in certain contexts again and again; Wood (2020: 30) provides the following examples: "senior management, single parent, and plastic surgery".

As Wood (2020: 31) suggested, it might be argued that formulaic sequences are merely sequences of words that appear together more frequently than other combinations of words, however, on the one hand, there are also some formulaic expressions, which are considered as such but do not occur quite frequently in common communication, and on the other hand, not any string of words used a lot of times is formulaic language (Wray, 2000: 466-467). Often, the connected pronunciation of several words stuck together can be an indicator of formulaic language or, for L2 learners, the use of a string of words which is actually out of the normal lexical range of the language user can show that the phrase was not put together by them just then but that it is a formulaic sequence (Wray, 2000: 467).

Even though there are somewhat fuzzy boundaries between several different types of formulaic language, which can make classifying individual sequences difficult (Wood, 2020: 30), idioms and compounds shall be explained as follows: Idioms are fixed word combinations, whose meaning does not directly relate to the individual words' meanings and can also have metaphorical meanings. Therefore, Wood (2020: 32) summarises the "key quality of an idiom is its semantic non-compositionality and non-productive form", which can be explained in that the meaning of the entire idiom is not the sum of the meanings of the idiom's parts and that the idiom cannot be grammatically transformed. Compounds are sequences consisting of two words, the second of which acts as "head or core" and the first one, the nonhead, describes the head (Wood, 2020: 33). Compounds can appear in three different forms, in a closed form where the two words are written as one word, e.g., "laptop", a hyphenated form, e.g., "open-handed", or an open form, e.g., "real estate" (Wood, 2020: 33). What has to be mentioned is, that the nonhead of a compound clearly distinguishes the type of the head such as a 'hat rack' is a specific piece of furniture, whereas a 'metal rack' is any type of rack made out of metal, which means that it is not a compound.

Learning formulaic language

Native speakers mostly know these rules of word combination, which McCarthy calls "collocational appropriacy", while "even very advanced learners often make inappropriate or unacceptable collocations" (1990: 13). Wray (2002: 143) states that in order "[t]o know a language you must know not only its individual words, but also how they fit together", and she further adds that a "crucial aspect is coming to know which of the feasible grammatical utterances are idiomatic and nativelike". Siyanova-Chanturia and Pellicer-Sánchez (2019: 1) assume that "native speakers of a language possess extremely large repertoires of [formulaic sequences] that they draw on in both spoken and written discourse", and therefore, second language learners ought to know and "use appropriately" many such sequences if they want to be highly proficient. It can be difficult, though, to master the natural or authentic use of formulaic sequences or it might even be impossible for adolescent or adult learners for whom not only the language but also the culture is foreign because there seems to be a strong link between formulaic language choices and cultural information, which cannot be or is not conveyed in synthetic classroom settings (Wray, 2000: 468).

The form and function relationship, or actually the distinction between the two, for formulaic sequences is different and more difficult than for individual words, as it is often not easy to separate their function from their form (Wray, 2000: 464). Technically, the very beginning of any language course is based on formulaic sequences, as we often start out with "providing a few pre-learned utterances for asking the way to the station or ordering a cup of coffee" (Wray, 2000: 463). However, dealing with such formulaic sequences becomes more complex when it comes to choosing such phrases in line with "native speakers' preferences for certain sequences of words", as there are several "turns of phrase that have no other apparent linguistic merit than that 'we just say it that way'" (Wray, 2000: 463). The fact that words are used in combination leads to certain combinations that come up more often than others and mean something the individual words contained in those multi-word units, or collocations, cannot express on their own (Nation, 2020: 21). More knowledge about words can include constraints or restrictions of word use, as for example, swear words or impolite words are not always appropriate, some words are part of a geographical dialect or are rather used with children than with adults (Nation, 2020: 22). More importantly, other words are more often used in written or

spoken language or are used in more or less formal circumstances, here, the distinction between Germanic and Latinate words, with the latter being more formal, has to be mentioned (Nation, 2020: 22).

The reason why learners ought to tackle formulaic language is not simply that L1 speakers use them and that is why L2 speakers should use them too, but formulaic sequences actually have some helpful functions. Functions of formulaic sequences are that, on the one hand, they make processing easier and more efficient, so that a speaker has some strings of words ready when producing an utterance, and, on the other hand, they convey social meanings such as "greeting, thanking, apologizing, and so on", which also helps for the best possible and easiest comprehension for the hearer (Wray, 2000: 473-477). All in all, even though formulaic sequences are sometimes merely regarded as important aspects to learn as an L2 learner just because L1 speakers use them, they also aid and simplify the production and comprehension of utterances and facilitate successful communication (Wray, 2000: 479).

Word knowledge

Knowing words in a language is not all there is to know, there are seven categories of word knowledge mentioned by Taylor (1990: 1-3) [original emphases]:

- 1) "Knowledge of *frequency* of the word in the language, i.e. knowing the degree of probability of encountering the word in speech or in print" (1990: 1),
- 2) "Knowledge of the *register* of the word, i.e. knowing the limitations imposed on the use of the word according to variations of function and situation" (1990: 2),
- 3) "Knowledge of *collocation*, both semantic and syntactic [...], i.e. knowing the syntactic behaviour associated with the word and also knowing the network of associations between that word and other words in the language" (1990: 2),
- 4) "Knowledge of *morphology*, i.e. knowing the underlying form of a word and the derivations that can be made from it" (1990: 2),
- 5) "Knowledge of *semantics*, i.e. knowing firstly what the word means or 'denotes'" (1990: 2),
- 6) "Knowledge of *polysemy*, i.e. knowing many of the different meanings associated with a word" (1990: 3), and
- 7) "Knowledge of the equivalent of the word in the *mother tongue*" (1990: 3).

There is a distinction between receptive vocabulary and productive vocabulary. The receptive vocabulary "needs to be further developed into productive vocabulary in order to be used in a communication context", which has to be considered a process "from superficial familiarity with the word and ending with an ability to use the word correctly in free production" (Qian & Lin, 2020: 68). Nation (2020: 16) describes three areas of knowledge - form, meaning, and use - which he further divides into three sub-areas, or aspects, each and for each aspect he distinguishes between receptive and productive knowledge. For example, under form, there is the spoken aspect, which regards the sound and pronunciation of a word as receptive and productive knowledge, respectively (Nation, 2020: 16). Interestingly for the purpose of this thesis, one of the aspects of meaning is associations and the receptive knowledge for this aspect is explained with the question, "What other words does this make us think of?", and the productive knowledge with, "What other words could we use instead of this one?" (Nation, 2020: 16).

Learning the sounds which are typical for a language and how to pronounce them is crucial, particularly for younger learners, "because one way that words can enter long-term memory is through the phonological loop" (Nation, 2020: 17) and older learners also have other ways of remembering words apart from hearing or saying them repeatedly. Subsequently, knowing sounds can also be helpful when learning to read in an alphabetic language, where the written form of a word is systematically linked with its pronunciation (Nation, 2020: 17). Nation (2020: 18) suggests practising sound games and sounding out words from their individual sounds in order to improve learners' "phonological awareness" until they are able to read full words, phrases, and texts. A further part of knowing the form of words is knowing parts of words, which, for the English language, means knowing inflection and derivation, which carry meaning and are helpful for processing (Nation, 2020: 18). Nation (2020: 18) concludes that knowing words' forms and the form-meaning connection are the most important facets of vocabulary knowledge.

Word knowledge tests

In order to ascertain how many and which words learners know, whether they know particular words, and how well they know the words, vocabulary or word knowledge tests can be conducted. At first, this sounds rather simple; however, vocabulary tests provide

results, or scores, which carry a lot of information that have to be made meaningful by carefully interpreting them (Fitzpatrick & Clenton, 2017: 844-845).

There are several vocabulary tests which try to measure vocabulary knowledge by relying on word frequency and the assumption "that learners acquire words according to the frequency with which those words occur in language use", as for example the 'Vocabulary Levels Test', the 'Eurocentres Vocabulary Size Test', the 'Vocabulary Knowledge Scale', or the 'Productive Vocabulary Levels Test' (Fitzpatrick & Clenton, 2017: 845). However, tests like that claim to measure something that is actually too complex to be measured by simple tests because "knowing a word is not an all-or-nothing phenomenon" and word knowledge ought to be considered "multidimensional", as there are several aspects that can be known about a word (Fitzpatrick & Clenton, 2017: 845). Aspects that need to be considered when devising a vocabulary test are receptive and productive vocabulary knowledge, if a word is completely known or just somewhat understood and also "how a word relates to others in the lexicon" (Fitzpatrick & Clenton, 2017: 846). Receptive vocabulary tests mostly try to measure the size of the vocabulary, so they assess "the number of words a learner knows, at threshold level at least" (Fitzpatrick & Clenton, 2017: 847), whereas productive vocabulary tests require the participants to produce language themselves. There are "controlled" and "free productive" tests; for controlled vocabulary tests, there are certain constraints or rules to be followed by the test takers in order to collect specific results and in free vocabulary tests, there are no such constraints (Fitzpatrick & Clenton, 2017: 846).

1.2. Mental lexicon

Since competent users of language are able to produce meaningful words in an extremely short amount of time, it is assumed that there is some sort of organisation of vocabulary going on in the human mind, which is known as the mental lexicon (McCarthy, 1990: 34). Aitchison (2012: 5) agrees that there most certainly has to be some kind of organisational system of how words are stored in our minds, since we store so many of them and are able to use them very quickly and it is said that "[...] the human mind is both flexible and extendable, provided that the information is structured" (Aitchison, 2012: 5).

There are several different metaphors for the visualisation and explanation of the mental lexicon, one of which is that of a "network composed of numerous nodes and links: each node represents a lexical item with the necessary lexical information attached with other

nodes by links" (Ma, 2009: 54). Another metaphor for the mental lexicon is that of a dictionary. Aitchison (2012: 11) argues, though, that the widely accepted comparison of the mental lexicon to a dictionary is not actually descriptive of what the human word-storage really is. For one, most dictionaries are organised alphabetically as opposed to the human mind, which can be shown by considering a person choosing a wrong word by mistake: The person is very unlikely to choose a word which comes directly before or after the wanted word in the alphabet but rather a word from the same lexical set, the same part of speech, or a word with similar sounds or pronunciation. Furthermore, except for thesauri, dictionaries do not organise words according to their meanings and traditional printed dictionaries contain a set and countable number of word entries, which does not change - at least until the next edition - whereas the human mind, as mentioned earlier, is flexible and includes new entries on the go, Aitchison argues (2012: 11). What can be mentioned here is that modern online dictionaries change all the time. Dóczy (2020: 46) prefers the comparison of the mental lexicon to a map, or more precisely a public transport map, which might be more fitting, as the words stored in our minds might be connected in a similar way as various stations in a city are connected through the different lines, but unfortunately the connections in our minds are invisible and difficult to be traced (Dóczy, 2020: 46). Furthermore, there is more information than just the mere words stored in our mind and we do not know how and where all of that additional data is connected to the words in our mental lexicon (Dóczy, 2020: 46).

Most people do not have a sense of the vast number of words stored in their mind. Aitchison (2012: 5) notes about native speakers that "[e]ducated adults generally estimate their own vocabulary at only 1 to 10 percent of the real level [...]". However, it is difficult to provide an actual number of words in a human mind, as already the definition of words is unclear and testing the number of words in a person's mental lexicon is (not yet) possible, but an estimation would be that "[a]n educated adult might well know more than 150,000 words, and be able to actively use 90 percent of these" (Aitchison, 2012: 6). This very high number is not widely agreed upon, others estimate an adult's vocabulary size of about 20,000 to 40,000 words (Lightbown & Spada, 2013: 61).

Input, storage, retrieval

It is expected that there is some kind of structure in our mind, or more concisely in our mental lexicon because of the extremely large number of words and the incredibly fast ability to recall and use these words; however, there is no consensus as to how words are actually processed, stored, and retrieved (Dóczy, 2020: 46). But there are three processes that are considered to happen: input, storage, and retrieval (McCarthy, 1990: 34). In order to deal with vocabulary, the mind needs some input, which means that “language is ‘written in’ in some way”, then the language is stored so “that it is held and not lost”, and finally, the retrieval happens when we want to use the stored vocabulary (McCarthy, 1990: 34).

Ma (2009: 29) further divides the process of writing a new word into the mental lexicon, especially a word in a foreign language, by saying that it first only means saving its form together with just one of its meanings. Any other information, i.e., information about the word, will only be found out and stored later on, after several encounters. As a result of only knowing form and meaning of a vocabulary item at first and building on this knowledge over time, the knowledge of different vocabulary items varies.

Ma (2009: 34) explains the breadth and depth of vocabulary knowledge with a model of building blocks on a board as base. The size of the board is used as a visualisation of the size of one's vocabulary, or the vocabulary breadth. And the individual building blocks are meant to depict the knowledge about single words, which is of different sizes for different words, depending on how long the word has been in the vocabulary and how much stored information there is about it. In technical terms, the height of the building blocks is the depth of vocabulary. “While breadth relates to the quantitative aspect of vocabulary knowledge, depth is concerned with its qualitative aspect”, with the categories of word knowledge as the qualitative information (Ma, 2009: 36).

The view of what type of knowledge has to be stored in the mental lexicon has changed as there has been a development away from rule-based theories, which considered “syntactic regularities of language” as rules, to usage-based models, which consider language to be built from “linguistic construction units (e.g., words, phrases, formulaic expressions, and chunks)” (Dóczy, 2020: 47). The mental lexicon is likely to be an interconnected system that deals with “morphemes to whole discourse level utterances”, which is possible “due to

repetitive language use, where observed patterns are followed and thus more and more complex structures can emerge over time" (Dóczy, 2020: 48). There are several theories and models dealing with how the mental lexicon is organised, one way it can be regarded is a "network of associations, instead of a rigidly hierarchical structure" (Dóczy, 2020: 51), which was a previous view, and Dóczy (2020: 51) explains that "this implies that each word might be related to several others".

In addition to how individual concepts are stored and linked with each other, the types of information contained in the mental lexicon are interesting. According to Dóczy (2020: 52), there are "conceptual (the ideas to be expressed), morphological (lemmas or word forms), and semantic (word meanings)" information stored, with lemma being "the basic unit of lexical storage and representation in the mental lexicon". In order to use the stored language in communication, the relevant words ought to be activated or lexically encoded, which happens in three steps: "first, [...] the relevant concept is selected", then the "corresponding lemma" is retrieved, and finally, "the phonological form of the lemma, the so-called lexeme, is extracted and the word is pronounced" (Dóczy, 2020: 52). This access to a certain word "results in the activation of all the memory traces that contain significant information in relation to this particular concept" (Dóczy, 2020: 53).

Knowledge vs. retrieval

What is important to distinguish regarding the storage and retrieval of words is the difference "between *knowing* and the ability to *retrieve* that knowledge", as the two might not be directly related (McCarthy, 1990: 43). This is something many people can probably relate to, since we have most likely all been in a situation where something, or more precisely some word, was on the tip of our tongue, which would mean that we basically knew the word we needed but could not produce it when we needed it.

Core words

Beyond the question of how our mind enables us to retrieve words, it is also worth considering which words are most readily available in our mental lexicon and are, therefore, maybe the most relevant or important words. Finding out, "whether some words are more *core*, or central to the language, than others" [original emphasis], is an attractive goal for language teaching purposes (McCarthy, 1990: 49). According to McCarthy (1990: 49), "core words [of a lexical field] tend to be the most frequently

occurring ones”; however, he admits that “this may just be a circular way of saying people use such words more frequently because they do have core meaning-potential and are therefore useable in a wide variety of situations.”

1.3. Mental lexicon and second language acquisition

As previously mentioned, there are receptive and productive word knowledge and also receptive and productive language retrieval, depending on the context in which the language ought to be used. And just like in everyday life, language courses also require learners to use both of these retrieval skills. McCarthy (1990: 43-45) explains receptive retrieval as “matching spoken or written input to stored sound and orthographic patterns and their associated meanings”, whereas productive retrieval “follows reverse paths [...]: meanings have to be given forms; some of the forms will be simple words, some will be derived words and compounds, some binomials, fixed collocations, and other multi-word units.” He goes on by pointing out the usefulness of “pre-assembled chunks of these kinds” for the learners to “access such segments of language very quickly and from a very early stage in learning a foreign language” (McCarthy, 1990: 45).

In order to have second language words, or even chunks, readily available, they ought to be put and organised in “an L2 lexicon [which] means inserting numerous L2 lexical entries and linking them together” (Ma, 2009: 55). Ma (2009: 55) explains that the “first[, and most important,] step in building a lexical entry” is to combine meaning and orthographical form of a word. And, since quite often the L2 meaning is uncertain, “the L2 word form [is connected] with an existing meaning in the mind”, which mostly is the L1 meaning, translation, or definition (Ma, 2009: 57). A new word is not immediately put into the mental lexicon upon its first meeting, though; it has to be met several times for the aspects form and meaning to be understood individually and, subsequently, connected to each other (Kersten, 2010: 63). Only at a later stage are semantic, syntactic, morphological, and phonological information “all integrated into the lexical entry” (Ma, 2009: 58). And when this has happened, “all types of lexical information have become proceduralised and can be retrieved for use automatically” (Ma, 2009: 58). Ma (2009: 63) supposes that actually all words are integrated into the mental lexicon in that way; however, not all lexical entries, and certainly not all L2 entries, will ever completely reach the potential depth of word knowledge.

L1 vs. L2 mental lexicon

Not only the general organisation of the mental lexicon is viewed in different ways, but there are also differing opinions on how additional languages play a role in the mental lexicon, as there could either be separate systems for individual languages or a shared system for several languages (Dóczy, 2020: 54). Dóczy (2020: 54) summarises that there is more likely to be a shared system where individual languages coexist and interact with each other, which might be dependent on factors such as language proficiency, as the lexical activation seems to be faster in both languages if they are known or spoken proficiently. However, there is a difference between the connections between concepts in the L1 and the L2: "the links between L1 lexical items are stronger and more salient than the connections between L2 words" (Dóczy, 2020: 54). This is also mentioned by Kersten (2010: 30) who states that the relationships between individual entries tend to be less stereotypical in a second language than they are in the first language, as for example, an L1 user might associate 'van', 'tent', or 'campfire' with the word 'camping', whereas a beginning L2 learner might associate 'car' or 'house' with the word 'camping'. Kersten (2010: 30) explains that this is due to the fact that the L2 vocabulary generally consists of fewer items and, therefore, has fewer connections and associations, which makes associations produced in association tests somewhat more random. However, the more advanced L2 learners become, the stabler and more systematic their associations, and thereby their connections in the mental lexicon, become, which tells us that the L2 mental lexicon is not fundamentally different from the L1 mental lexicon, but it simply works differently depending on proficiency, or lack thereof (Kersten, 2010: 31). What can also happen when there are several different languages, is that they may influence each other, as the stored concepts and words in each language can be altered continuously and, thereby, change the organisation in other languages as well (Dóczy, 2020: 54). These changes can happen both consciously as well as unconsciously and make the mental lexicon an "integrated network of lexical items" (Dóczy, 2020: 61). Kersten (2010: 32) sums up that "[t]he level of proficiency seems to be one of the most important influencing factors in the organisation of the mental lexicon." The level of organisation is higher in the L1 mental lexicon than in the L2 mental lexicon, but they are connected with each other (Dóczy, 2020: 61).

In L1 association, the following trend can be observed: Children start out by producing more syntagmatic associates; however, later on, adults produce more paradigmatic associates (Kersten, 2010: 31). According to Fitzpatrick and Izura (2011: 374), this development happens around the age of 6 or 7. Taking this into consideration, Kersten (2010: 31) suggests that this development could also be true for L2 association. This shift might be due to “the restructuring of a growing lexicon” (Fitzpatrick & Izura, 2011: 374). Therefore, Kersten (2010: 31) proposes teaching syntagmatic as well as paradigmatic relationships of vocabulary items in order to foster and stimulate both types of connections in the learners’ brains.

Mental lexicon and vocabulary learning

The mental lexicon is an ever-changing, dynamic system, which adapts when new words or information about words are added, but it also adapts depending on the proficiency of language and the way a language is learned - for example, if it is mostly learned through translation, which often happens in early language-learning stages, the connections with the L1 equivalents is stronger (Kersten, 2010: 32-34). This is also mentioned by Nation (2020: 18), as in the beginning stages of learning an L2, the form-meaning connection is mostly attaching an L1 meaning to an L2 form. As soon as learning is not based on mere translation anymore, the connections change and the ones with L1 equivalents are weakened.

Learning new vocabulary, or any part of language for that matter, should ideally always be contextualised. Learning and studying vocabulary from lists of individual words and, quite often, their L1 translation is also known as rote learning (Kersten, 2010: 70). Kersten (2010: 70) argues that, through this method, all the helpful and important context is taken away from the vocabulary items, which makes it more difficult and less meaningful to acquire the words from the list. What makes learning vocabulary easier and more meaningful is paying close attention or attention being drawn to new vocabulary items in a context, for example in a reading text (Kersten, 2010: 71). Then, the new word(s) ought to be retrieved and repeated several times before they should be used in a creative way (Kersten, 2010: 72).

What has to be considered, though, is that coming across new words while reading is only possible if the learners can already read texts, which can only be assumed for intermediate

and advanced learners, before that, words ought to be taught in different ways (Kersten, 2010: 75). Beginners have to be introduced to words directly, as for example by showing them an action or a picture (Kersten, 2010: 76). Kersten (2010: 77), among others, does not recommend providing an L1 translation to every new word because, on the one hand, this would convey the misconception that the two languages are organised in the same way and just have different words for each meaning or thing and, on the other hand, this would not foster the L2 mental lexicon to form itself apart from the L1 mental lexicon. Providing explanations, definitions, synonyms, or antonyms, however, are recommended by Kersten (2010: 77). For all language levels, repetition and use of new words in various contexts are required to really internalise the items after meeting them for the first time and when the words have been used several times in rather closed activities, they can be used in more open tasks, such as information gap activities (Kersten, 2010: 78-79).

After some time, learners might come across new meanings or additional meanings of the same forms, which can be learned more easily than learning new forms entirely (Nation, 2020: 19). However, there are also some words that have several different meanings even though their form is the same, these are called homonyms, homographs, or homophones, depending on whether the spoken and or written form are the same: homonyms are spoken and written the same way, homographs have a different pronunciation despite them being written the same, and homophones sound the same but are written differently (Nation, 2020: 19). Nation (2020: 20) recommends not teaching homonyms, homographs, or homophones together but introducing learners to the most frequent meaning first.

1.4. Word association

In order to find out about how and which connections and relationships are stored in the human mind, word association lends itself well as a way to examine these phenomena. Zortea and de Salles (2012: 77) define word association as a process in which “participants [...] respond with the first word that comes to mind (*associate*) when a stimulus word [...] is presented” [original emphasis]. Cramer (1968: 2) summarised several early word association studies with the assumption “that associations *per se* reflect something basic about the nature of the mind and its thought processes” [original emphasis]. Interestingly, back then, she did not write about the mental lexicon yet but only mentions the thought processes. However, she (Cramer, 1968: 3) goes on to explain that

there is a long historical tradition for making the assumption that knowledge of overt verbal associations will tell us something about the nature and structure of the mind. The ‘laws of association’ of the early Greek philosophers were developed out of an attempt to explain the sequence of ideas occurring in a train of thought.

This shows that Cramer (1968: 3), following the Greek philosophers, expected there to be some kind of “structure of the mind” and a meaning behind “the sequence of ideas occurring in a train of thought” and that this is closely linked with the way people associate words. Fitzpatrick and Thwaites (2020: 237) also agree that word association tasks can help us understand the mind because “the resulting data [...] carries potential information about lexical availability, organization, and retrieval” and they go on to argue that studying “[a]ssociative retrieval [...] has direct relevance to our understanding of language acquisition and processing, and by extension to language teaching” (Fitzpatrick & Thwaites 2020: 238).

From creating word networks using word association data we can derive that individual words have links to connect them with each other in the mental lexicon and these links can have different characteristics: The links can be ‘weighted’, which refers to the strength of a link, and they can be ‘directed’, which means that they only work in one direction (Fitzpatrick & Thwaites, 2020: 258). If the links are unweighted, the strength is irrelevant and “only the existence of the connection is important” (Kovács et al., 2021: 182). Furthermore, a word has a degree, which describes the number of links the word has to other words (Kovács et al., 2021: 182), and if the word has a high degree, it can be considered ‘central’ and central words are important for continuing to build the network, as new words want to attach to those central words (Fitzpatrick & Thwaites, 2020: 258). From this model, we can deduce that words that are thought of first when hearing or reading a stimulus word, i.e., words that are associated with a stimulus word, are likely to have a strong, or weighted, link to the stimulus word. Interestingly, there happens to be ‘assortative mixing’, which means that similar words have links to each other, and they can have “shared features of concepts, semantic, phonological or orthographical similarity” (Kovács et al., 2021: 185). Moreover, if participants are not able to produce any or only a few associates to certain stimulus words, they are not central words in their mental lexicon.

In most considerations of the mental lexicon, as well as word association, content words are focused on more often than function words. The parts of speech most frequently looked at in this context are nouns, verbs, and adjectives, "which are regarded by many people as constituting the 'lexicon proper'" (Aitchison, 2012: 120). Finding out how content words are stored in the human mind and connected with each other in the context of word association is of great interest for many researchers and also for this master's thesis.

What has to be considered regarding word association data is that there are several aspects that influence a person's associative behaviour: the person's age, their L1 and other languages they know, their strategy to answer questions, but also the target word can influence a person's association (Fitzpatrick & Izura, 2011: 376). Furthermore, word association is not something that happens homogeneously among a group of participants; however, individuals tend to be consistent in their responses (Fitzpatrick, 2007: 319).

Word association and second language proficiency

Accessing chunks of language which were learned not only helps language users to retrieve the words and produce language, but it is also part of word association. Ma (2009: 28) argues that one needs a certain word knowledge and also knowledge about words in order to be able to make associations with the words. Furthermore, word association depends on or is a part of the depth of vocabulary knowledge, as one needs to know more about a word than just its form and (one of) its meaning(s) but also network knowledge in order to be able to make connections between two (or more) words (Ma, 2009: 45).

This connection between word association and word knowledge is also mentioned by Fitzpatrick and Thwaites (2020: 240), who add that "different kinds of association are likely to be salient at different stages of learning" a foreign language. As mentioned before, this change in association might occur because of a certain alteration or modification of the mental lexicon (Fitzpatrick & Izura, 2011: 374). For example, beginners and intermediate learners cannot come up with as many associates as more proficient learners (Fitzpatrick & Thwaites, 2020: 241). Furthermore, the more proficient learners are, the more likely it is that their responses can be found in a norms list and less proficient language users tend to respond with words that might have a similar form or sound rather than a similar meaning or context (Fitzpatrick & Thwaites, 2020: 241). Therefore, being able to associate words shows a deeper understanding of language and proficiency than mere translation

of words. This is also why both response stereotypy, i.e., the likeness of responses to responses in a norms list, and the number of responses a participant produces can be considered measures of vocabulary knowledge (Fitzpatrick & Thwaites, 2020: 241).

As it is not always easy to think of any words in a target language, especially if one is not very advanced in the language and even though one is presented with stimulus words from that language, it is also of interest to see how many blank responses and also L1 responses or responses from any other language are produced in word association tests.

1.5. Word association tests

Word association tests might help us find out more about the mental lexicon, as the way the associated words are related to each other might show how those words are stored and organised in the human brain and, in the case of word association tests in a second language, also inform about the development of the second language mental lexicon (Dóczy & Kormos, 2016: 90). Using word association tests has been a practice to analyse behaviours and processes of our minds for about 150 years and is now used for finding out about the way the mental lexicon, quite often also the second language mental lexicon, is organised (Fitzpatrick et al., 2015: 23).

There are free word association tests, where participants are asked to respond to stimulus words with any one-word answer that comes to their mind, sometimes, the same stimulus word is used several times to see if the response changes or what other responses it might elicit, and some other times, participants have more time for each stimulus and they should continue to give answers that come to their mind (Cramer, 1968: 11-12). The responses in word association tests are called associates (Zortea & de Salles, 2012: 77). In addition to free association tests, there are controlled word association tests - the test conducted in the course of this research project is a controlled word association test - where "the subject must choose his [sic] response from a restricted domain of responses specified by the experimenter" (Cramer, 1968: 14).

The following aspects of conducting word association tests are to be considered: "mode of elicitation", "cue choice", "norms lists", and "treatment of responses" (Fitzpatrick et al., 2015: 26). The first one, mode of elicitation, is about whether the stimulus words as well as the associates are written or spoken, respectively. The choice of cue words, or stimuli, has to be made regarding parts of speech, word frequency, or the concreteness of the cue

words. Many studies compare the associated words with norms lists, which can either be already existing or compiled from the responses of the studies' participants themselves. Finally, the responses can be treated in various ways; for example, it has to be considered if spelling mistakes are corrected, if some responses are grouped together, or what happens with multi-word responses and blanks (Fitzpatrick et al., 2015: 26). Fitzpatrick et al. (2015: 31) suggest correcting spelling mistakes if the intention is clear, in order to make processing and searching automatically easier, but they do not correct words if the misspelt version is also a word, as there could be inferences by the analysts changing the results.

Basic measures that can be drawn from word association tests are the associative strength, the meaning set size, and the total set size (Zortea & de Salles, 2012: 77). Associative strength is the ratio of participants who produced a certain associate; it is a strong associate if the percentage is at least 25%, a weak associate if the percentage is less than 10%, and a medium associate if it is between strong and weak (Zortea & de Salles, 2012: 77-78). The meaning set size is the number of different words given as responses to a stimulus word, which sheds light at how similarly participants think about the stimulus word, and the total set size is simply the total number of responses (Zortea & de Salles, 2012: 77-78).

Norms lists

Word association tests are often conducted using set lists of stimuli for which normative data, i.e. word association responses produced by sizeable groups of participants, has already been collected in order to be able to compare the results of a test with results from many other experiments (Fitzpatrick & Thwaites, 2020: 242). The research dealing with the comparison of word association responses with this kind of normative data, which are also known as norms lists, looks for the stereotypy of word association behaviour, which is also considered to be an indication of language proficiency (Fitzpatrick & Thwaites, 2020: 242). Most of the norms lists are compiled by having native language users take the word association tests. In order to score the stereotypy of the association responses of L2 learners, it is advisable to count a response as stereotypical, if it "appears anywhere in the norms list", whereas for L1 analysis, a response should be counted as stereotypical, if it "is the dominant response on the norms list" (Fitzpatrick et al., 2015: 33-34).

However, since there are assumptions that L1 and L2 mental lexica are organised differently, there might not be any sense or benefit of comparing word association test results with native speakers' test results (Dóczy & Kormos, 2016: 90). A further argument against using norms lists with native-speaker data is that proficiency in a second language is not to be considered native-likeness, which is also not necessarily the goal of any language learner (Fitzpatrick & Thwaites, 2020: 244-245). Furthermore, it has to be mentioned that, even though native users' word associations are also not all homogeneous, they at least share a cultural background, which cannot be expected from L2 learners (Fitzpatrick & Thwaites, 2020: 245). Meara (2009: 25) confirms this and expresses his take on the issue of the nature of the norms lists as follows:

Teaching a language aims to produce people who are bilingual, not mere replicas of monolingual speakers. It would, therefore, be more appropriate to compare the associations of learners with those of successful bilingual speakers, and not with native speakers.

This means that the use of a norms list created with data from advanced or proficient L2 language users might be more meaningful and a better fit for the analysis of L2 word association.

Types of word association

In general, word association has been analysed according to "Saussure's notions of paradigmatic and syntagmatic relationships" for many years (Fitzpatrick & Thwaites, 2020: 239). The differentiation between those two types of association lies within the question of whether the stimulus word and the associated word typically co-occur within a clause, which makes it a syntagmatic relationship, or whether the associated word can be used instead of the stimulus word, which makes it a paradigmatic relationship. This provides information about how the stimulus word and the associate are linked in the mental lexicon.

A further relatively common type of association is the phonetically similar or clang association (Fitzpatrick & Thwaites, 2020: 249). Here, participants read or hear the stimulus word and produce a word that sounds or is spelled similarly but does not have anything else in common with the stimulus word. Finally, an erratic association is present if there is no logical link between the associate and the stimulus word (Fitzpatrick et al., 2015: 41).

Concrete and abstract nouns

The concreteness of a noun is a measure that gives information about whether a noun refers to something really existent or something that is simply in our imagination. Cousins et al. (2017: 45) explain that “[c]oncrete nouns typically refer to entities that are tangible and exist in the real world, and thus have perceptible features, such as appearance, feel, or sound.” Quite similarly, Brysbaert, Warriner and Kuperman (2014: 904) describe the essence of concreteness as “the degree to which the concept denoted by a word refers to a perceptible entity.” Another way to distinguish between abstract and concrete words is to consider whether they are “language based” in the case of abstract words or “experience based” in the case of concrete words (Brysbaert, Warriner & Kuperman, 2014: 906). Cousins et al. highlight how relevant the distinction with regard to the way in which the nouns are processed in the human brain is as concrete concepts include linguistic as well as sensory information, whereas abstract nouns are just represented by their linguistic information, which also means that those abstract concepts are less palpable as they are mere products of our thinking and they do not physically exist (2017: 45).

What might be relevant to vocabulary teaching and learning is that it is easier to process and remember concrete rather than abstract words “because they activate perceptual memory codes in addition to verbal codes” and “because they are related to strongly supporting memory contexts” as people are rather likely to remember scenarios and the concrete elements and objects in them (Brysbaert, Warriner & Kuperman, 2014: 904). Therefore, it will be interesting to see whether participants are more likely to respond with concrete nouns. Interestingly, concrete nouns as target words seem to produce less predictable responses than abstract nouns (Fitzpatrick, 2007: 324). However, concrete stimulus words seem to be easier to respond to as responses tend to take less time and fewer blank responses occur for these words (Fitzpatrick & Thwaites, 2020: 262). This might show that connections to concrete words are stronger and more easily available in the mental lexicon.

Emotional causality

In the word association test of this study, the stimulus words used are the eight basic emotions compiled by Schuff et al. which are “Anger, Anticipation, Disgust, Fear, Joy, Sadness, Surprise und [sic] Trust” (2017: 1). What can be analysed when dealing with word

associations to these emotions is in how far they are related to each other, not only in a linguistic way, but also in the sense that emotions are mostly present as reaction to an event or a situation and there are also consequences or results of emotions. Ekman (1999: 46) explains emotions as reactions to events or objects but at the same time also as something that “mobilize[s] the organism”, which probably everybody knows from personal experience. A sudden loud noise triggering surprise, an important event ahead triggering anticipation, a strong smell triggering disgust are just a few examples of situations to which emotions are reactions. Sweating when experiencing fear, smiling when experiencing joy, or crying when experiencing sadness are some examples of how emotions can mobilise our bodies.

The above-mentioned aspects of emotions are also known as “emotional causality” (Dirven & Niemeier, 1997: 55). Dirven and Niemeier (1997: 55) call these two aspects “the cause of emotions” and “emotions as cause”. They define a cause as “an inner or outer force which triggers an effect” (Dirven & Niemeier, 1997: 55). Taking emotional causality into consideration, the responses to the word association test will be analysed regarding the way in which they are causally related to the stimulus word – they can either trigger the emotion or they can be the result of the emotion. An analysis of emotional causality might show, in which causal order participants think of the emotions as stimulus words. They might either read an emotion word and associate a reason why the emotion is experienced or start at the emotion and think of any results happening because of the stimulus word.

Findings and observations

According to the lexical competence study by Zareva, Schwanenflugel and Nikolova (2005: 587), which included a word association test, there is hardly any concordance between the word association performance of L1 language users and advanced or intermediate L2 learners, respectively; however, it was found that the number of associations was dependent on the learners' language proficiency level, as advanced learners were able to produce nearly twice as many associations as intermediate learners.

Fitzpatrick and Thwaites (2020: 241) also state that the more proficient a learner is, the higher the number of responses they will give and also the higher the number of responses found in a norms list. They furthermore report that children tend to associate differently

from adults as there is a “shift from syntagmatic to paradigmatic responses at around 6-8 years old” (Fitzpatrick & Thwaites, 2020: 239-240). They add that this shift is also likely to be observed in L2 language users, dependent on their language proficiency, as beginners of a language produce similar association responses as young L1 language users, whereas more advanced L2 learners produce more associates which are similar to adult native speakers (Fitzpatrick & Thwaites, 2020: 240).

The types of association also seem to be dependent on the participants’ language proficiency, as the comparison of several association studies shows that less proficient participants are likely to produce syntagmatic associates and clang associates, the latter especially if the stimulus word is rather unfamiliar to them (Fitzpatrick & Thwaites, 2020: 250). Paradigmatic responses are more likely to be produced by advanced language users, particularly “if they know the cue word well enough to use it in a sentence” (Fitzpatrick & Thwaites, 2020: 250). In a lexical availability study using a word association test, it was found that fewer responses are provided for abstract emotion words (love, hate, happy, sad) than for concrete words (school, animals) by 10–12-year-old EFL learners (Jiménez Catalán & Dewaele, 2017: 293).

1.6. Vocabulary teaching and learning

Based on the previously presented aspects of vocabulary and the mental lexicon, considerations about vocabulary teaching and learning are made below. For the purpose of teaching and learning vocabulary, it has to be considered in what way vocabulary items enter the human mind, which happens differently for children and adults (Taylor, 1990: 6), or for the L1 or an L2, as a learner of a second language has already been through the process of acquiring a first language and has developed a way to “categorise the world from their L1 experience” (Codina Camó & Pladevall Ballester, 2015: 112). In the case of children’s language and vocabulary learning in their L1, we mostly speak of acquisition, which mainly happens incidentally, whereas adults rather learn “by conscious application of rules” (Taylor, 1990: 6). It is possible, though, that children both acquire and learn new vocabulary (Taylor, 1990: 6). Taylor (1990: 6) suggests catering for both ways and proposes “discussing the *formal* aspect of a new vocabulary item focusing on it and encouraging its repetition” in order to foster learning vocabulary and offering “freer [...] activities in which the new item is used in *meaningful interaction*” [original emphasis] for acquiring

vocabulary. The difference between L1 language acquisition and L2 vocabulary learning does not only lie in the way the language is organised in our minds but also in the type and duration of exposure to the language. Other than in the L1, where one tends to be surrounded by input opportunities, learners are mostly only exposed to an L2 in set language classroom periods. This means that since there is not as much time to be incidentally exposed to the language, and thereby naturally acquire vocabulary, L2 vocabulary ought to be taught explicitly (Codina Camó & Pladevall Ballester, 2015: 112-113).

Repetition is key

Taylor also points out that repetition is essential for sustainable vocabulary knowledge (1990: 6), which Nation (2008: 103) also agrees on when mentioning that repetition is the key for the best result of vocabulary learning, which would mean that a lot of information about a vocabulary item is stored and also readily available to be retrieved and, thereby, used. Ma (2009: 118) moreover explains that incidental, implicit L2 vocabulary learning should not be the only way of learning vocabulary due to three reasons: “(1) the risk of wrongly guessed meaning, (2) the low learning rates, and (3) the acquisition would be recognition rather than production”; therefore, there should always also be explicit vocabulary instruction.

However, Nation (2008: 5) argues that it is difficult to teach a lot of vocabulary as there are so many words and it would take up an incredible amount of time to teach even just the most important or most frequently occurring words. Furthermore, he explains that learning vocabulary is a "cumulative process" which means that learners ought to come across new words in several contexts and through different modes of input in order to be learned satisfactorily. Nation also mentions the different pieces of information that need to be learned and stored for each vocabulary item, such as semantic and syntactic information in addition to (one of) the meaning(s) and the form of the item (2008: 5).

Learning new vocabulary items or learning more about words already known is dependent on various factors, the most important ones being the "number of meetings and quality of attention" (Nation, 2020: 23). Regarding the quality of attention there is a difference whether a word is processed rather incidentally or deliberately and both of those ways of processing can happen at different qualitative levels from simply noticing a word to

elaborating work (Nation, 2020: 23). Nation (2020: 24) expresses his view that the first introduction of vocabulary items is quite irrelevant in the face of the fact that the repetition of the items is much more crucial for vocabulary retention as follows:

Each word needs to be met several times in a variety of ways and we should expect knowledge of each word to grow and strengthen over time rather than expect each word to be fully learned on the first meeting. A teacher's concern should not be with how a word should be introduced to the learners, but with how it can be met multiple times in a variety of contexts.

Introducing new vocabulary

Nevertheless, in an earlier text, Nation provides several more or less obvious or surprising principles to be followed when teaching new vocabulary. Some of the more palpable and rather intuitive, as they are also quite broadly phrased, principles he proposes (Nation, 2008: 5-6) are:

1. that the focus of deliberate, explicit vocabulary teaching should be put on high frequency vocabulary,
2. that learners should be equipped with suitable vocabulary strategies,
3. that "clear, simple and brief" explanations of word meaning should be used,
4. that the provided meaning should be one of the most common meanings of the vocabulary item, and
5. that the learners should be given ample practice opportunities for the purpose of repetition.

Despite the fact that he (Nation, 2020: 18) later argues that L1 translation should be avoided (after the beginning stage of learning an L1) in favour of stronger mental links between L2 items and other researchers deem teaching words together with synonyms and antonyms meaningful (Kersten, 2010: 77), Nation interestingly proposes (2008: 5-6) two less expected principles for introducing new vocabulary:

6. that the L1 translation of a new word should be provided, and
7. that new words should not be presented with any of their near synonyms or antonyms.

To specify the first principle, Nation (2008: 7) defines high frequency words as everyday words which come up in all sorts of "speech and [...] writing, and in novels, conversation, newspapers, and academic texts", and adds that there are rarely any longer or complex

words and that many of them are functional ones like articles, prepositions, or pronouns. The benefits of teaching and learning high frequency words are that, on the one hand, there are numerous opportunities to practice them and, on the other hand, once they are known, there are also many opportunities to successfully understand and use them. Therefore, Nation (2008: 13) argues that it is definitely worth spending time on teaching them deliberately. It might also be argued that as long as learners' vocabulary is too limited to be able to guess words' meanings from context explicit vocabulary instruction is necessary. New vocabulary can be introduced by using objects, mime, or pictures, as things that one sees tend to be remembered more easily and more efficiently than mere words; furthermore, linking the L1 equivalents to L2 items can also be beneficial (Codina Camó & Pladevall Ballester, 2015: 113). Codina Camó and Pladevall Ballester (2015: 111) admit that "[p]roviding the mother tongue (L1) translation [...] is very often regarded as a controversial practice"; however, they do mention that, mainly in early foreign language learning stages, a connection between L1 and L2 equivalents can be helpful. In 2020, Nation (18) also explains that L2 forms are mostly attached to L1 meanings in the beginning stages of learning an L2, but with progress, he does not recommend mere translation for intermediate or advanced learners, as the links between new L2 forms or meanings with existing L2 items are stronger than links with L1 items. Kersten (2010: 77), however, states that not every new L2 item should be introduced together with an L1 translation and explains that this practice might convey a false sense of two parallel language systems with the same organisation and individual words for the same concepts or meanings.

Taylor (1990: 11-17) proposes three different types of stimuli for presenting new vocabulary items: written, non-verbal, and oral/aural stimuli; and recommends a mix of various stimuli "to give learners as wide a knowledge as possible of an item" and "written consolidation for adults, in order to facilitate transfer from short-term to long-term memory" (17). What is more, when introducing new vocabulary items, teachers ought to make sure to use precise and concise stimuli, in contrast to Nation's (2008: 6) opinion, not be afraid of teaching opposites, utilise helpful resources or materials in the classroom, explain meanings clearly and explicitly, and draw the learners' focus either on meaning or form rather than on both at the same time (Taylor, 1990: 38-41); the distinction between meaning and form – and even use – is also made by Nation (2008: 100).

What can be added from the findings Dóczy and Kormos (2016: 178-180) summarise as the conclusion of their "longitudinal developments in vocabulary knowledge and lexical organization", in which they conducted several different tests, including a word association test, is

- that it is necessary for second language teachers to know what makes it easier or more difficult to learn a particular word (i.e., word length and word frequency among others),
- that it is only recommendable to provide L1 translations for lower-level learners,
- that not only word form and meaning ought to be deliberately taught but also aspects such as collocation or morphology,
- that vocabulary encounters should not only be individual words, but also chunks and set phrases,
- and that applications or programmes on electronic devices can motivate learners to learn on their own.

As listed above, Dóczy and Kormos (2016: 178-180) do not completely disagree with Nation (2008: 5-6) regarding the presentation of new vocabulary items and their L1 translation but specify that it is only recommendable when teaching lower-level learners, which Nation also stated in 2020 (18). When teaching intermediate or advanced learners, however, they advise against translating vocabulary items. All in all, it does seem to be helpful for beginners to be provided with some L1 translations, with the exception of vocabulary items that can easily be explained or shown with the help of pictures or motions. Later on, when the learners are intermediate or even advanced, attaching new L2 items to L1 meanings should be avoided in order to strengthen the L2 links in the mental lexicon.

Quick vocabulary attention

Sometimes, a language teacher does not want to spend too much time or does not want to disrupt the ongoing activities too much but still wants to ensure that the learners know a relevant word. For this purpose, there are various possible actions that only quickly draw attention to a vocabulary item; for example, providing an L1 translation, giving a simple definition of the word, showing an object or picture, demonstrating it, drawing it or making one or more sentences with the word. Nation (2008: 98) also suggests "us[ing] a known L2

synonym" for quickly checking word knowledge, even though he stated earlier in his book (2008: 6) that synonyms should not be used. However, in that case, he was writing specifically about the initial introduction to a word rather than the quick and incidental mention of words that learners might already know and that are just needed for a specific activity, which might be the distinguishing factor for him.

If a teacher is rather interested in showing learners a word form, writing it down for the learners to read or saying it out loud for them to repeat its pronunciation are possibilities among others, while pointing out word usage can be done by mentioning the grammar, providing some words that regularly appear in collocations with the word, or reminding the learners of any exceptions of use (Nation, 2008: 98).

Practising vocabulary

After the first encounter with a new word or phrase, practising and consolidating vocabulary items can be done with regard to the previously mentioned seven categories of 'knowledge of a word' Taylor put together, i.e., frequency, register, collocation, morphology, semantics, polysemy, and L1 translation. Examples of practice activities provided by Taylor (1990: 44-71) respectively for each category are, for instance, that high-frequency words are chosen for lower language levels, that texts of contrastive registers are used and compared, that learners create their own word mind maps, that the formation and derivation of different parts of speech are practised, that synonymous or antonymous words have to be chosen, that words with several meanings are analysed and used in sentences, or that successive back-and-forth translations in a bilingual dictionary are made.

A practical example of teaching words with their morphology in mind is provided by McCarthy (1990: 5), who suggests teaching "derived adjectives ending in '-al' (e.g. 'brutal', 'frontal', and 'horizontal')" together as a group. Learning vocabulary together with or from peers is also a helpful way to stabilise word knowledge, as learners get to talk about and negotiate a word's meaning in interactive and communicative activities such as information gap activities (Nation, 2008: 27).

In order to get the learners to engage themselves with the words and also practise vocabulary, Nation (2008: 101-102) provides several vocabulary exercises which can be easily conducted without too much effort for the teacher. Examples of learning word

meaning are: "[u]sing the dictionary" and "[g]uessing from context", examples of learning word form are: "[s]pelling dictation[s]" and "[w]ord parts" where morphemes are discovered, and examples of learning word use are: "[s]uggest collocates", where students write down many collocates, and "[w]ord detectives", where several linguistic aspects of a word are discussed (Nation: 2008: 101-102). Exercises which need slightly more preparation are matching activities between words and their meaning or collections of word families or collocations, which can be done in vocabulary logs or diaries.

As mentioned above, Nation (2008: 114) suggests the use of dictionaries and notes that learners ideally use dictionaries meant to be used by learners. He also provides three advantages of having learners use dictionaries: "(1) They can help learners understand words that they meet in reading and listening. (2) They can help learners find words that they need for speaking and writing. (3) They can help learners remember words." Nation (2008: 115) points out that, for a learner to be able to use a dictionary successfully and meaningfully, they need to be able to guess words from context. "If the learner goes to the dictionary with some rough idea about the possible meaning of the word, there is more chance of locating the right meaning" (Nation, 2008: 115). This can be practised by looking up words while reading a text, whereby the learner has some context and maybe even a presumption of what the words might mean.

An even deeper and more active engagement with the vocabulary items can be reached by having learners deal with the words and phrases in a creative way, as, for example, mind-maps, which offer the learners the opportunity to organise words in their own way (Luangkrajang, 2022: 1617). By arranging words and phrases in a certain way, learners are actively engaging with the language and it is especially meaningful that they organise the items in a way that makes sense to themselves (Padak, 2006: 9). Several different mind-maps, collections and creative word arrangements can be put together in a vocabulary portfolio, which can foster vocabulary learning (Zarei & Baftani, 2014: 45).

Digital language learning

Nowadays, in the digital age, there are even more possibilities to learn and practise new words in a second language. The omnipresent smartphone can aid us with this as there are numerous ways how mobile phones but also tablets and laptops can be used to learn a language, and especially the vocabulary part of it. This type of learning is also known as

“mobile-assisted language learning (MALL)” and includes any type of learning that is done with a handheld device (Jordan, 2020: 8). There are several different modes of using mobile devices for language learning, for example, those devices made playing and recording audio files on the go possible (Jordan, 2020: 17). Furthermore, there are numerous websites that provide language learning activities and explanations as well as playful mobile phone applications which make practising language fun.

Several applications can either be used individually by the learners or they can be used together in the classroom or for homework. Websites such as *kahoot* or *socrative* offer helpful functions which enable students to compete against each other in the classroom using their mobile phones. Other websites can have flashcard features which can help learners revise any words or phrases they might need. A further option is audio-visual input spanning from TV shows and films to TED-talks and videos on various platforms, which can even be adapted to the needs of L2 learners by showing subtitles or captions (Montero Perez, 2022: 163).

1.7 Summary

In order to present the theoretical concepts relevant to the study of the present thesis, an overview of the areas of vocabulary, the mental lexicon and how it is connected to second language acquisition, word association, and vocabulary teaching and learning has been provided. To sum up, learning a language, and especially a second language, requires the mental lexicon to process a lot of new data. Completely new items as well as new information about existing items such as new meanings, contexts, or collocations of already known words ought to be incorporated and stored in the human brain in a way that it can be retrieved again later on. Both the breadth, i.e., the number of different items a person knows, as well as the depth of vocabulary knowledge, i.e., the knowledge they have about the items, influence their language proficiency and having chunks of language stored together and readily available can help with the retrieval and usage of the language.

Word association research tries to find out which language items are retrieved when prompted with a certain stimulus word. Depending on the way the associated words are linked with the cues it might be found out how they are stored. The type of relationship between associates and stimuli can also give information about language proficiency. The

present study is set out to analyse the word association behaviour of Austrian teenagers learning English as a second language.

2. Methodology

2.1. Research questions

The general aim of this research project is to find out what ESL learners associated with emotion words, how different vocabulary teaching interventions affect ESL learners' word association behaviour and to also draw conclusions about the improvement of the learners' language proficiency, as it has previously been discussed that word association, as well as the mental lexicon, is connected with language proficiency. The following sub-questions shall be answered separately in order to cover the rather broad research interest:

- 1) Do ESL learners respond with more associates to a word association test after a vocabulary teaching intervention than before?
- 2) What kind of words do ESL learners associate with stimulus words from the semantic field of emotions?
- 3) Are the responses of ESL learners to a word association test more likely to appear on a norms list after a vocabulary teaching intervention than before?
- 4) Are ESL learners more likely to respond paradigmatically than syntagmatically to a word association test after a vocabulary teaching intervention?
- 5) Do ESL learners tend to associate rather concrete or abstract nouns and does this change after a vocabulary teaching intervention?
- 6) Which vocabulary teaching intervention leads to the most changes in word association behaviour and are those changes desirable in terms of language proficiency?

2.2. Participants

The participants of the present study were two groups of 14 ninth grade students and two groups of tenth grade students, one consisting of 23 and the other one of 18 students, at a vocational upper secondary school in Lower Austria. The participants were between the ages of 14 and 18 years and have had nine to ten years of English as a Second Language instruction. Table 1 provides an overview over the groups' gender distribution, school

grade, and the interventions conducted with the various groups. Interventions 1, 2, and 3 are described in detail in chapter 4.

Table 1: Overview over groups and participants

Participant groups	No. of participants	Grade	Intervention
<i>Group 1</i>	23 (13f, 10m)	10	1 (definitions)
<i>Group 2</i>	14 (10f, 4m)	9	2 (portfolios)
<i>Group 3</i>	14 (10f, 4m)	9	3 (film)
<i>Group 4</i>	18 (15f, 3m)	10	- (control)

All participant groups received three lessons of English per week at the time of the study. The participants were made aware of the fact that the study was conducted and that the results were dealt with in an anonymous and randomised way. The participants read and signed a consent form (see Appendix B) prior to taking part in the study.

In order to be able to analyse the results of individual participants and groups, the learners created their own test ID, which they wrote on their word association test forms. For generating the test IDs, an adaptation of Schnell, Bachteler and Reiher's four-element code for self-generated identification codes (2010: 406) was used: They actually use the first two letters of the mother's name, the number of "older siblings alive", the Birthday, and the first two letters of the father's name. What was added, was that, if the participant was unsure of one of the elements – as there might not have been both parents still alive or in the participant's life – they should use the letter X instead. As well as the participants' self-generated codes, the group number, and the information whether it was the pre- or the post-test were also noted down. In addition to the actual test items, demographic information, i.e., age, gender, first language, and second language(s), were also collected for the purpose of analysing the word association behaviour of different subgroups. These data are potentially insightful for the analysis. The entire questionnaire can be found in appendix A.

2.3. Data collection

This research project about the effect of different vocabulary teaching interventions on ESL learners' word association behaviour is a study with a pre-test/post-test design. The

data collection can be divided into three stages: the pre-test, one of three teaching interventions, and the post-test.

In the beginning, a controlled word association test using the eight basic emotions as stimulus words to which the participants are asked to react was conducted. They were asked to note down the first three nouns they had in mind when reading each stimulus word. This was a replication of a previous study of mine, which was conducted using proficient university students of English as participants (Machart, 2018). That study was not a pre-test/post-test study though, therefore, this element together with the interventions and also the different group of participants – upper secondary students – are changes from the original study.

After the pre-test, three different vocabulary teaching interventions, which each took three lessons, were performed in three different groups of EFL learners. There was also a fourth group which served as a control group without a teaching intervention in between the two word association tests. Each group of learners were instructed with one of the following three teaching methods.

The first group defined the basic emotions using different online dictionaries, learned about the use of the different words, and played games such as pictictionary and activity with the words. This method followed the style of explicit vocabulary instruction (Young-Davy, 2014). The second group creatively engaged with the vocabulary items by creating vocabulary portfolios (Zarei & Baftani, 2014). And in the third intervention, the learners were dealing with the semantic field of emotions by watching the animated film “Inside Out” (Pixar, 2015) and discussing human emotions in class. While watching the film in English, the English captions were shown, as this improves comprehension as well as vocabulary acquisition (Montero Perez, 2022: 168). In order to remember any relevant occurrences or incidents from the teaching interventions that might also offer valuable clues to possible findings, an intervention diary was kept.

Subsequently, the post-test was carried out in the lesson after the intervention had been finished. In total, the study took up five lessons in each group, but the first and last lessons were only partly used, as the word association tests only took up about half of a lesson each. For this post-test, the same controlled word association test as in the pre-test phase was used in order to be able to expediently compare them later on.

2.4. Data analysis

After the data collection was complete, all word association test responses were entered and organised in electronic spreadsheets and then the data analysis began. There were three parts of the data analysis: a comparison of the student answers with the results of my previous study among university students of English, which are used as norms list, as well as a comparison of the student responses with the other students' responses, an analysis of the types of association, and a comparison of the pre-test and post-test responses. Before the actual analyses could begin, it was taken into consideration that some responses could not be included in the analysis: On the one hand, only the results of learners who took part in both tests were considered in the analysis, which meant that data from only 51 participants was included in the analysis. On the other hand, responses that were left blank, not a noun, L1 or a different language than English, non-existent words, or illegible had to be excluded.

For the norms list comparison, the responses of my previous study with university students of English were used as the norms list for this particular word association test (Machart, 2018). Even though it is more common to use norms lists compiled from L1 language user responses, the proficiency of university students of English should be sufficient and the cultural background and the fact that they were also L2 language users makes the data more fitting for comparison (Dóczy & Kormos, 2016, Fitzpatrick & Thwaites, 2020). This norms list was used to find out to what extent the upper secondary learners associated similar nouns with the stimulus words to the more proficient language users, which is an indication of proficiency according to Meara (2009), Ma (2009), and Dóczy and Kormos (2016). When the responses of the present study were matched with the norms list, singular as well as plural forms of the nouns were accepted. In addition to comparing the results of the present study to the ones of the study from 2018, the responses were also matched with a list compiled from the responses of the present studies' participants themselves in order to find out how similar their answers are to their fellow participants' responses and whether this similarity differs between pre- and post-test. This comparison within the data is done because research has shown that norms lists work better among age groups and Fitzpatrick et al. (2015: 45) therefore argue that norms lists have to be chosen wisely or even compiled for the purpose or age group.

As Meara (2009) also states that with an improvement of language proficiency, the type of word association responses changes, the next step of analysis was the type of association. This analysis was threefold. One inspected dimension was whether the responses were in a syntagmatic or a paradigmatic relationship to the respective stimulus word. The second dimension was the emotional causality, meaning whether the response is a cause of the emotion or rather caused by the emotion and, therefore, a result of the emotion. And the third dimension under investigation was the concreteness of the responses. For this analysis, the concreteness ratings collected by Brysbaert, Warriner, and Kuperman (2014: 906) from over 4,000 participants, who rated nearly 40,000 English words on a scale from 1 to 5, 1 being an abstract or “language based” word and 5 being a concrete or “experience based” word.

The final stage of each analysis, which shed light on the main research question of how different vocabulary teaching interventions affect ESL learners’ word association behaviour, is the comparison of the results of the pre-test and the post-test, taking the findings of the previous two stages of analysis into account. What was also considered are the excluded responses from both tests, as there were fewer responses that had to be excluded in the post-test than in the pre-test. This way, it could be discovered in what way the word association responses differ before and after the three different teaching interventions. In order to find out whether the results are statistically significant repeated measures ANOVA calculations were conducted. An overview of the conducted analyses can be found in Appendix D.

3. Word association test

As already mentioned in the subsection on data collection, the controlled word association test used in this research project has already been used for a previous study, it was developed in the course of a proseminar on semantics at the University of Vienna in 2018. The test was designed in way that participants were asked to write down three nouns they first thought of when reading each of the eight stimulus words (Machart, 2018: 4). The stimulus words in this word association test are the eight basic emotions “Anger, Anticipation, Disgust, Fear, Joy, Sadness, Surprise und [sic] Trust” (Schuff et al., 2017: 1).

Some adaptations were made to be more inclusive and to offer even more opportunities for analysis: There is a third option, “I’d rather not say/non-binary”, to choose from for the

gender information. And the question about the participant's first and second language(s) was also added. The complete questionnaire can be found in Appendix A.

The semantic field of emotions as stimulus words was chosen because, on the one hand, associating words with emotions should not be too difficult, as many people have experiences with various emotions. On the other hand, the eight basic emotions are all abstract nouns, with an exception of "surprise", which, considered as an emotion, should also be abstract, but as it can also be an event, it appears to be concrete in Brysbaert, Warriner and Kuperman's database "Concreteness ratings for 40 thousand generally known English word lemmas" (2014) and, according to de Groot (1989: 825), we store more information about abstract concepts than about concrete concepts.

As explained in the subsection on data collection, this word association test was conducted twice in this research project. Firstly, it was used as a pre-test and, secondly, it served as a post-test after the three different teaching interventions had taken place. The three teaching interventions were each implemented in a different group of participants, whereas the same word association test was used across all four groups, i.e., the three experimental groups and the control group.

4. Interventions

As previously mentioned, there were three different teaching interventions focusing on vocabulary. Each intervention was used for a different group of participants. The three approaches are described in the following subsections.

4.1. Intervention 1

In this intervention, learners worked with monolingual as well as bilingual dictionaries, collocation dictionaries, and thesauri to find out about the meaning of emotions. They should each do research about the words and come up with a definition in their own words for each of the emotions in the first two lessons. To help them find the right meaning, they could also translate the words into German, or another language. The goal was that each learner puts together their own dictionary of emotions. In the third lesson, the learners got some time to review their own notes and then they played activity with emotion-related words. In these games, one student drew a word card and had to either describe,

mime, or draw the word on it for their team to guess as many words as possible in one minute.

Defining words in a second language, finding out about their meaning, and finding collocations for the words are beneficial for learners (Young-Davy, 2014: 27-29). Young-Davy (2014: 27-28) proposes the “look it up twice” method, which means that learners look up a new word in a bilingual dictionary first – that is supposed to prevent them from being immediately frustrated when reading several additional difficult words in the monolingual dictionary – and then they should consult a monolingual dictionary and compare the definition there with what they learned from the bilingual dictionary. By comparing different definitions, learners find out about nuances and different uses of the word (Young-Davy, 2014: 28). The game in the third lesson is supposed to serve as a positive emotional stimulus, creating an emotional bond and a good memory relating to the vocabulary items, which can potentially improve the vocabulary retention (Kralova, Kamenicka & Tirpakova, 2022: 7).

4.2. Intervention 2

In this intervention, a mind map with the central word ‘emotions’ was created together as group using the interactive online brainstorming software mentimeter (mentimeter.com). Then, learners were shown several examples of different options for vocabulary portfolios and got the task to start their own vocabulary portfolio about the topic of emotions. The learners were instructed to take the words from the mind map as inspiration and starting point for their individual portfolios. They had two lessons to work on their portfolio and they were allowed to consult online dictionaries and thesauri, which were pointed out to them beforehand. In the third lesson they were asked to choose their favourite page of their portfolio and present it to the rest of the group.

Through this intervention, learners could engage with the semantic field of emotions in a creative way. In general, vocabulary portfolios are often organised in a similar manner as mind maps and mind maps have been proven to be helpful when dealing with vocabulary as they offer the learners a way of organisation (Luankrajang, 2022: 1617). And creating vocabulary portfolios is also considered to be beneficial for vocabulary learning (Zarei & Baftani, 2014: 45).

4.3. Intervention 3

In this intervention, the group watched the animated film “Inside Out” (Pixar, 2015), which deals with human emotions and their effects. As the film is 91 minutes long, it was divided into three sections, each one about half an hour. The remaining fifteen to twenty minutes of each of the three lessons of the intervention were used for the discussion of human emotions, talking about how it feels to experience the different emotions, how emotions can change and also how they can be changed or influenced, and what might happen if one emotion is particularly prevalent over a period of time.

While watching the film in the target language English, English captions were shown in order for the learners to be able to read as well as listen to the goings-on, which supports the language comprehension (Montero Perez, 2022: 168). Even though one might think that reading the same message as one can hear would be redundant, studies have shown that this redundancy actually helps L2 learners with their language development (Montero Perez, 2022: 169). Interestingly, this effect does not seem to be dependent on the learners’ language proficiency (Montero Perez, 2022: 168). However, not only content comprehension but also vocabulary learning can be boosted by watching captioned videos or films in a second language (Montero Perez, 2022: 173). Montero Perez (2022: 173) explains that “watching captioned video results in significantly larger vocabulary gains than uncaptioned video, which has been attributed to the fact that captions help learners to segment and decode the auditory input”.

5. Results

5.1. General presentation of results

Before presenting the results of the present study it has to be mentioned that some data had to be excluded from the analysis. There were some learners who were absent from either one or both tests – in group one, only eight out of 23 participants were present at both tests, and in group two, only eleven out of 14 participants were present at both tests. In groups three and four, all students, 14 and 18, respectively, were present at both tests, which makes a total of 51 participants who took part in both the pre- and the post-test. Twelve of the participants were male and 39 were female learners. The age distribution of the participants was as follows: Two participants were 14 years old, 24 participants were 15, 20 participants were 16, four participants were 17, and only one participant was 18

years old. The average age was 15.57 years and the median age was 15. Table 2 shows the participants' age and gender distribution.

Table 2: *Participants' age and gender distribution*

Age of Participants	Female	Male	Total
14	2	0	2
15	16	8	24
16	17	3	20
17	3	1	4
18	1	0	1
<i>Total</i>	39	12	51

48 of the 51 participants stated that their first language was German, the other three participants' first languages were Farsi, Slovakian, and Turkish. The answers provided about the participants' second languages were more varied. Both the number of second languages as well as the languages the participants wrote down as their second languages differed. Two participants with German as their first language did not provide any second language, which is slightly strange and surprising as they did take part in this study which was conducted in English. However, seven other learners also did not write down English as one of their second languages, so the explanation of second language might not have been clear enough or the participants supposed a threshold level of language proficiency. But English was mentioned as second language by the remaining 42 students. Thirty participants stated only one second language, 23 of which wrote down English. The other seven students provided six different languages: Hungarian, Italian, which was written down by two people, Slovakian, Spanish, Turkish, and German, which was written down by the participant whose first language was Turkish. 14 participants listed two second languages, all of which included English. Eleven of them added Spanish, Italian, Hungarian, and German, which was written by the person whose first language was Farsi, were each added once. Five participants wrote down three second languages, one of which was the person whose first language was Slovakian, who listed Czech, English, and German. The others each included English and one Romance language, which are taught at school,

Italian and Spanish each came up twice. The third provided second languages were Hungarian, Serbian, Czech, and Slovakian.

As each participant was presented with a word association test with eight stimulus words for which there were three response gaps each, there could have been 1,224 responses. In the pre-test, 374 responses were excluded for being blank, 95 responses were not a noun, 2 responses were L1 or a different language, 2 responses were non-existent words, and 3 responses were illegible. And in the post-test, only 330 responses were excluded for being blank, 72 responses were not a noun, 0 responses were L1 or a different language, 2 responses were non-existent words, and 3 responses were illegible responses. Therefore, 723 responses in the pre-test and 817 responses in the post-test were considered in the analysis. An overview over the numbers of invalid and valid responses of each group can be found in table 3.

Table 3: Invalid and valid word association responses

group	test	blank	not a noun	L1	non- existent	illegible	valid responses
<i>group 1</i>	pre	46	7	2	0	0	137
<i>(definitions)</i>	post	33	8	0	0	0	151
<i>group 2</i>	pre	82	2	0	0	0	180
<i>(portfolios)</i>	post	65	9	0	0	0	190
<i>group 3</i>	pre	129	41	0	1	2	139
<i>(film)</i>	post	127	18	0	0	0	191
<i>group 4</i>	pre	117	45	0	1	1	268
<i>(control)</i>	post	105	37	0	2	3	285
<i>all groups</i>	pre	374	95	2	2	3	723
	post	330	72	0	2	3	817

As noted in table 1, there were more valid responses in the post-test than in the pre-test, both overall and in each of the four groups. The difference between pre- and post-tests can be considered statistically significant with a p-value of 0.007397. Between groups, however, there is no statistically significant difference.

Since the groups consisted of different numbers of participants, it has to be considered how many valid responses were given per person, keeping in mind that each participant could produce 24 responses. The valid responses per person can be found in table 4.

Table 4: Valid responses per person

group	test	valid responses per person
<i>group 1</i> (definitions)	pre	17.13
	post	18.88
<i>group 2</i> (portfolios)	pre	16.36
	post	17.27
<i>group 3</i> (film)	pre	9.93
	post	13.64
<i>group 4</i> (control)	pre	14.89
	post	15.83
<i>all groups</i>	pre	14.18
	post	16.02

It can be seen that there is an increase of the average number of valid responses in each of the four groups from pre-test to post-test. Statistically, this is a significant change with a p-value of 0.02212. However, there is no significant difference between any of the four groups. What ought to be further mentioned is that there is a rather big range in the number of valid responses per person. This can be seen by looking at the standard deviations of each group in figure 2. There is an overall average standard deviation of about 5.5 valid responses, which is nearly a fifth of the highest possible number of responses of 24.

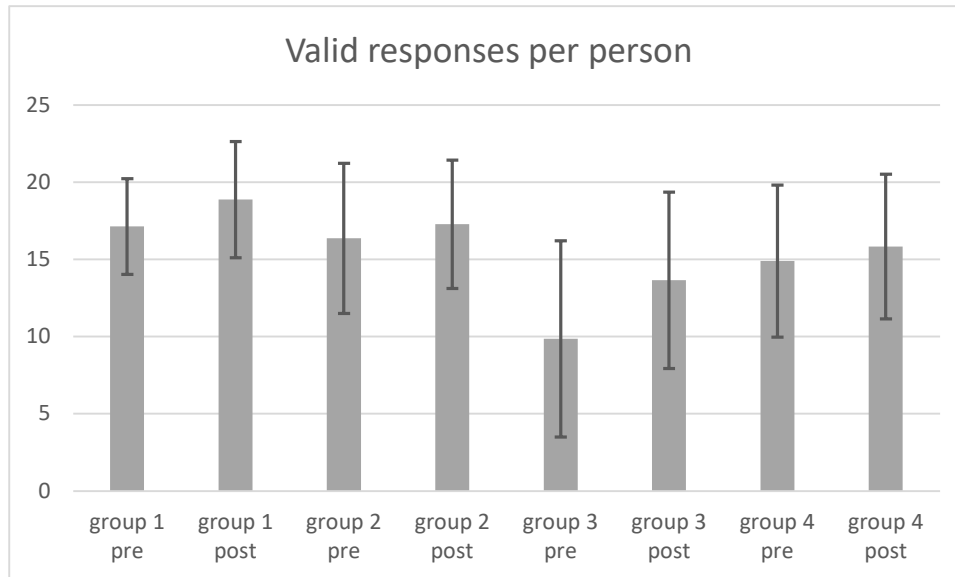


Figure 2: Valid responses per person with standard deviations

As there were only three participants in the pre-test and six participants in the post-test who managed to produce 24 responses, i.e., three associates for each of the eight stimulus words, and only one person in the pre-test and 2 people in the post-test even managed to produce 24 valid responses, it is worth looking at the percentage of valid responses of individual participants. For that, the number of valid responses is divided by the number of response attempts, i.e., responses that were not left blank. The results of this division is provided in percentages in table 5.

Table 5: Percentage of valid responses

group	test	% of valid responses
group 1 (definitions)	pre	93.62%
	post	95.08%
group 2 (portfolios)	pre	93.00%
	post	94.70%
group 3 (film)	pre	84.55%
	post	92.67%
group 4 (control)	pre	87.47%
	post	86.94%
all groups	pre	89.54%
	post	91.46%

A low percentage of valid responses means that even though participants attempted to respond, quite a few of the responses were to be considered invalid. A high percentage means that participants managed to respond more accurately or at least more accordingly to the task. Comparing the three experimental groups with each other, a significant change from pre- to post-test with a p-value of 0.0001011 can be observed. The control group's participants, however, produced a lower percentage of valid responses in the post-test than in the pre-test. Calculating the statistical significance of the difference of the changes of group 1 and 2 results in a low enough p-value of 0.04826, which shows that the effect of the intervention dealing with definitions is significantly different from the effect of the intervention with the vocabulary portfolios. There are no significant differences between any of the other groups.

Taking a closer look at characteristics that might influence the number of responses as well as the number of valid responses. With a p-value of 0.01041, it was found that older participants produced more responses and also more valid responses. Participants aged 14 or 15 only produced 13.56 on average and participants aged 16 produced 16.35 valid responses, while participants aged 17 or 18 produced 18.1 valid responses. There also seems to be a gender difference, as female participants produced more responses and more valid responses. However, the percentage of valid responses by male participants in the post-test was the highest with 97 percent. Moreover, it could be observed that participants with three second languages produced more responses than participants with fewer second languages.

As previously mentioned, more valid responses were produced in the post-test than in the pre-test; however, it is interesting to see that the difference in response numbers varies across the stimulus words, i.e., the eight basic emotions. Figure 3 shows the distribution of responses to each stimulus word in the pre-test as well as the post-test. Overall, the number of responses in the post-test is higher than in the pre-test, but the biggest absolute difference can be observed for the stimulus word *trust*, as there are 103 responses in the pre-test and 125 responses in the post-test. At the same time, 125 is also the highest number of responses a stimulus word received. By far the fewest responses were given to the word *anticipation*: Only 21 responses were written down in the pre-test; however, it nearly doubled to 39 responses in the post-test, which makes *anticipation* the stimulus

word with the biggest relative difference between pre- and post-test. On the other end of the spectrum, there are *anger* and *fear*, which both only received seven more responses in the post-test than in the pre-test.

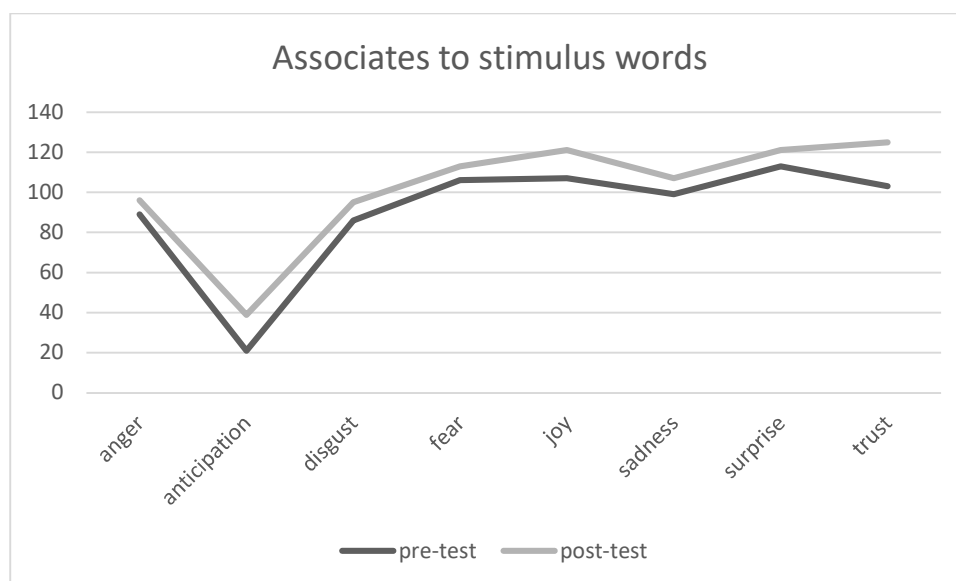


Figure 3: Word association responses to each stimulus word

Going back to *anticipation*, it has to be mentioned that all groups had difficulties associating words to this stimulus word. And interestingly, in all four groups, someone asked about the meaning of the word “anticipation” after the pre-test and very few learners knew it or were able to describe or define it, probably because the word is rather long, and it is also relatively rarely used in everyday English. Only in groups 3 and 4, somebody knew how to explain its meaning. Even though group 4 was the control group where no intervention or specific engagement with the vocabulary should have happened, one student was very fast with their description of what “anticipation” means and could not be stopped. What is noteworthy, though, is that the participants responded with great variation to this stimulus word.

5.2. Associated words

The range of variation of associates to the different stimuli can be observed when looking at the meaning set sizes, which refer to the number of different responses to a stimulus word. As can be seen in figure 4, there were 19 different words among the 21 responses to *anticipation* in the pre-test and 31 different words among the 39 responses in the post-test. The stimulus *anticipation* shows the highest variation of responses, most other stimulus words’ meaning set sizes are between a third and two thirds of the total number

of responses to the respective stimulus word. However, there is one other outlier: In the post-test, the stimulus *surprise* received 121 responses, but the responses were only 13 different words. Such a small meaning set size for the high number of responses is salient and tells us that the participants have a very similar way of processing and thinking about the word “surprise”. Among the most frequent responses to this stimulus word were “Birthday”, which occurred 29 times, “present” or “presents”, which occurred 26 times, and “party”, which occurred 19 times.

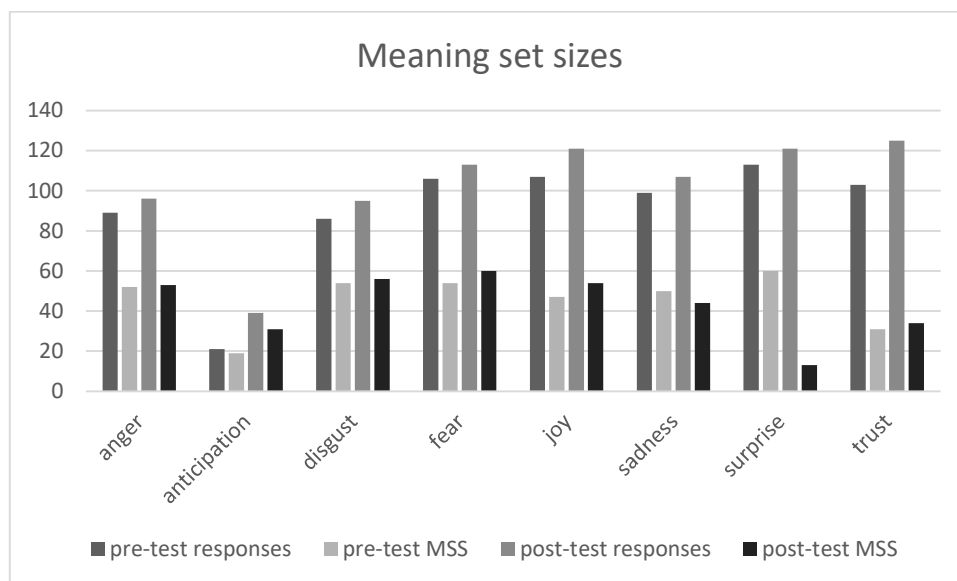


Figure 4: Meaning set sizes compared to number of responses to each stimulus word

Taking the individual groups into consideration, it was already mentioned previously that group 3 had the biggest improvement regarding the number of responses. There were more responses by this group in the post-test to all stimuli except for anticipation, where there were four responses in the pre-test and only three in the post-test. The largest difference can be found in the responses to *disgust*, as there were 14 additional responses in the post-test. The second strongest improvement was made by group 1: They wrote down eleven more responses to *anticipation* in the post-test. This might show us that the engagement with definitions to a difficult word such as “anticipation” helped the learners associate more words.

Having mentioned words which were associated to stimuli by many participants, there are also some interesting associates that were only written down once and are less obviously linked to the stimulus words. For example, the words “rollercoaster” and “plot twist” were associated to *surprise*. Coincidentally, a different participant associated the word

“rollercoaster” to *anticipation* rather than to *surprise*. A striking associate to the stimulus *trust* is “backstabber” and the rather advanced word “malice” which was associated to *anger*. The quite uncommon words “contentions”, “handkerchief”, and “trauma” were noted down as associates to the word *sadness*. These words can hardly be considered everyday words, let alone everyday words used by teenagers, but each one was thought of by a participant when they read the respective stimulus. Furthermore, modern life and its threats are represented by several associates, especially associates to the stimulus *fear*. The associates “AI” (for artificial intelligence), “global warming”, “overstimulation”, and “shootings”, for example, were each written down by one participant.

It can also be observed that words from particular semantic fields were associated by several participants. Several learners thought of words from the same semantic field as the stimulus words, namely the semantic field of emotions. Nearly 15% of all associates are part of this semantic field. The following table, table 6, shows various emotional words which were written down as associates. Sometimes, participants associated the emotions provided to them as stimuli with another stimulus word. The number of occurrences for the respective stimulus can be found in the brackets next to the associates. Whenever one of the eight stimulus words was written down as associate to a different stimulus, it is printed in bold. The word “fear” was associated with four other stimulus words. A complete list of associated words to all stimuli in both tests can be found in Appendix C.

Table 6: Associates from semantic field of emotions

Stimulus	Associates			
<i>anger</i>	aggression (5)	disappointment (1)	dislike (1)	emotion/s (8)
	fear (2)	feelings (2)	frustration (2)	hate (4)
	heartbreak (1)	impulse (1)	jealousy (1)	madness (3)
	rage (5)	sadness (5)	stress (3)	tension (1)
<i>anticipation</i>	anxiety (2)	emotions (1)	excitement (7)	feelings (1)
	happiness (1)	joy (1)	nervousness (1)	
<i>disgust</i>	dislike (1)	displeasure (1)	fear (1)	frustration (1)
	hate (1)	love (2)		
<i>fear</i>	anxiety (2)	emotion (1)	feelings (1)	fright (2)
	heartbreak (2)	hope (2)	horror (3)	loneliness (2)
	love (1)	overstimulation (1)	phobia (1)	sadness (1)
	scare (3)			
<i>joy</i>	excitement (1)	faith (1)	fun (4)	happiness (12)
	love (4)	luck (1)	pleasure (1)	smile (11)
	tears (1)			
<i>sadness</i>	anger (1)	cry (4)	depression (7)	disappointment (1)
	emotions (1)	emptiness (1)	fear (1)	frustration (1)
	grief (3)	hate (1)	heartbreak (4)	insecurities (1)
	loneliness (8)	loss (4)	love (5)	luck (1)
	stress (3)	tear/s (25)	trauma (1)	
<i>surprise</i>	excitement (2)	fear (1)	fun (1)	happiness (10)
	joy (3)	love (1)	panic (1)	scare (1)
	sorrow (1)			
<i>trust</i>	distrust (1)	hope (1)	love (4)	passion (1)

5.3. Comparison with norms list

The comparison of the word association data of the present study with the norms list, i.e., the data of my previous study from 2018 with proficient university students of English, shows minimal changes of concordance between the pre- and post-test. On average, 55.11% of the associates from the pre-test and 57.77% from the post-test appear on the norms list. This means that there is a small increase of words on the norms list after the teaching interventions. However, not all groups produced more words from the norms list in the post-test than in the pre-test, the percentage of norms list words produced by group

3 was the highest (61.78%) of all the groups in the pre-test but shrank to 59.16%, which is still higher than any other group's result in any of the tests. What ought to be mentioned is that even though group 4, the control group, did not receive a teaching intervention, their percentage of words appearing on the norms list also changed. It increased by around three percentage points, which is a smaller increase than the percentages of groups 1 and 2 experienced, though. The ratios and developments of words on the norms list can be seen in figure 5. Overall, these changes are not statistically significant though.

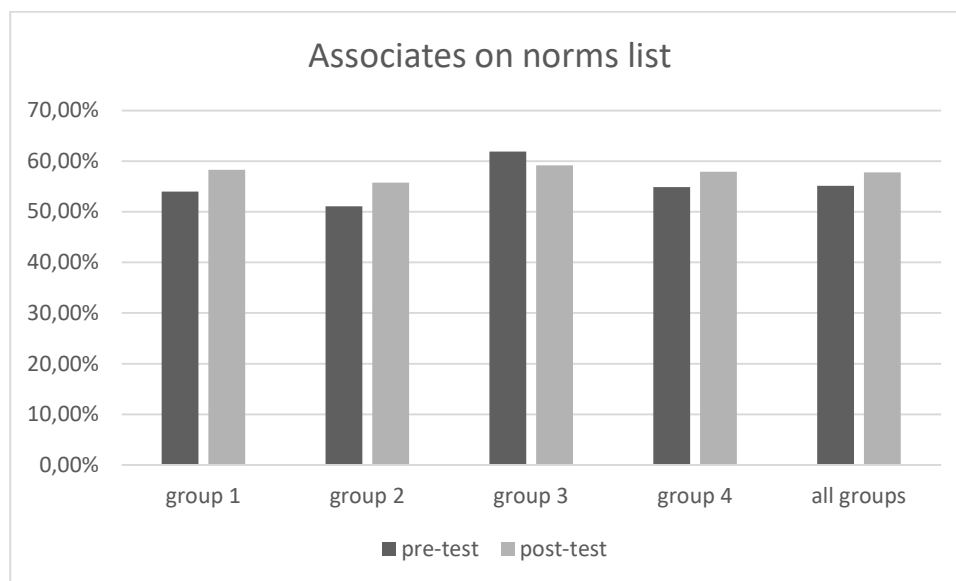


Figure 5: Percentages of associates on norms list

When analysing the share of associated words on the norms list and paying attention to participants' demographic characteristics, it was detected that participants aged 17 or 18 produced the highest share of words found on the norms list. Overall, female and male participants produced nearly the same percentage of words on the norms list. Interestingly, though, female participants produced significantly more words from the norms list in the post-test than in the pre-test, whereas male participants produced distinctly more words from the norms list in the pre-test than in the post-test. Furthermore, participants whose first language is not German produced a remarkable share of nearly 70% of words from the norms list; however, the very small sample of only three learners with a different first language makes this statistically irrelevant.

What can be added to the comparison of the present data with the previous data is that, for half of the stimulus words, the data share the same most frequent responses to the individual stimulus words. *Anger*, *disgust*, *fear*, and *surprise* received the same words as

their most frequent responses: “fight”, “food”, “darkness”, and “Birthday”, respectively. For most of the other stimulus words, the most frequent response from the norms list was also a strong associate, except for *anticipation*, which elicited “future” most frequently on the norms list, but “future” was not even among the associates in neither of the tests of the present study.

Apart from the most frequent responses to the stimulus words, table 7 also shows the associative strength of each of the responses. The associative strength indicates the ratio of participants who associated the same words. It was already noted in the theory part of this thesis that an associative strength below 10% is considered weak and a percentage over 25% is considered strong (Zortea & de Salles, 2012: 77-78). As already mentioned when dealing with meaning set sizes, participants of the present study did not associate very similarly to the stimulus word *anticipation*, that is why the associative strength of “excitement” (and “people”) is rather low. A strikingly high associative strength can be observed for the word “friends”, which was written down as an associate to *trust* by nearly three quarters of all participants. Similar to the associative strengths from the norms list, the stimuli *joy*, *surprise*, and *trust* led to the highest associative strengths, which might tell us that people think about and process these concepts rather alike.

Table 7: Most frequent responses to each stimulus word

stimulus word	norms list	ass. strength	pre-test	ass. strength	post-test	ass. strength
<i>anger</i>	fight	26.7%	fight	11.8%	fight, school	19.6%
<i>anticipation</i>	future	20%	excitement, people	3.9%	excitement	9.8%
<i>disgust</i>	food, spider	20%	food	17.6%	food	13.7%
<i>fear</i>	darkness	23.3%	darkness	29.4%	darkness	33.3%
<i>joy</i>	happiness	60%	friends	43.1%	friends	45.1%
<i>sadness</i>	tear	60%	death	29.4%	death	31.4%
<i>surprise</i>	Birthday	50%	Birthday	43.1%	Birthday	56.9%
<i>trust</i>	family	50%	friends	58.8%	friends	74.5%

The most frequent associate overall was “friend” and “friends”, respectively. In total, the two words were responded 136 times to any of the stimulus words, 63 times in the pre-test and 73 times in the post-test. 46 out of the 51 participants used one of the two words at least once in their questionnaires and only 5 participants did not write down either “friend” or “friends” to any of the stimulus words. Interestingly, they were produced as responses to six out of the eight basic emotions with *trust* and *joy* being the stimuli that elicited the two words by far the most. For *trust*, the words “friend” and “friends” was written down 68 times in 102 questionnaires, which means that two thirds of all participants not only used one of the two words, but they thought of it when reading the stimulus *trust*. The only two stimulus words which did not receive either “friend” or “friends” as an associate are *anticipation* and *fear*. The complete distribution of stimulus words which elicited “friend” or “friends” can be found in figure 6.

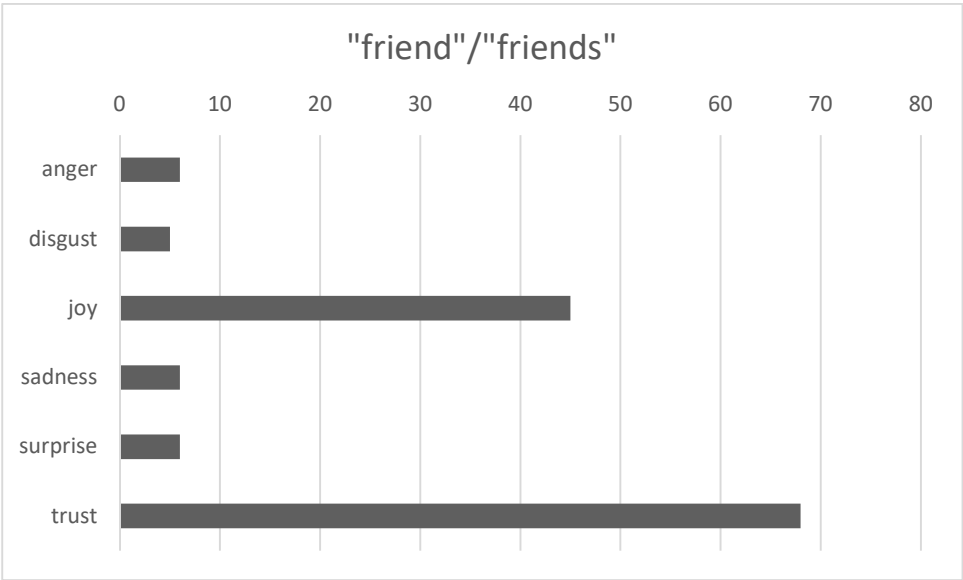


Figure 6: Distribution of stimulus words for “friend”/“friends”

In some cases, participants made some remarks to explain how they meant their association. When “friends” was associated with *anger*, *disgust*, and *sadness*, a total of eight participants noted that they meant “fake friends” and when “friend” was associated with *trust*, also eight participants noted that they meant “best friend”.

Having compared the present data with the previous data, it was found that, on average, the pre-tests contained around 55 percent of words from the norms list, the post-tests contained around 58 percent, and the highest percentage of norms list words was around 62 percent, reached by group 3 in the pre-test. If we now use the data collected in this

present study and look at the concordance within the participants, there is a much higher percentage of words that were associated by more than one person. On average, 84.46% of the words associated in the pre-test came up more than once, spanning from 79 to 87 percent. Moreover, in the post-test, this percentage even rose to 86.76%, spanning from 83 to 92 percent. In addition to the previously mentioned trend of higher concordance with the norms list of 17- and 18-year-old participants than younger students, this seems to show that word association depends on age, as the norms list from the previous study was compiled using data from participants aged 20 to 35.

5.4. Types of association

Overall, three different types of association could be observed: paradigmatic, syntagmatic, and erratic associates. There were no clang associations found in the results of this study. The vast majority of responses, about 83%, were syntagmatic ones, whereas about 16% were paradigmatic associations. Erratic responses made up the remaining one percent. As can be seen in figure 7, comparing the types of association which occurred in the pre-test with the ones from the post-test, it can be observed that the percentage of paradigmatic responses was 17 in the pre-test but decreased to 15 in the post-test. Conversely, syntagmatic responses increased from 82% to 84%. The percentage of erratic responses remained approximately the same.

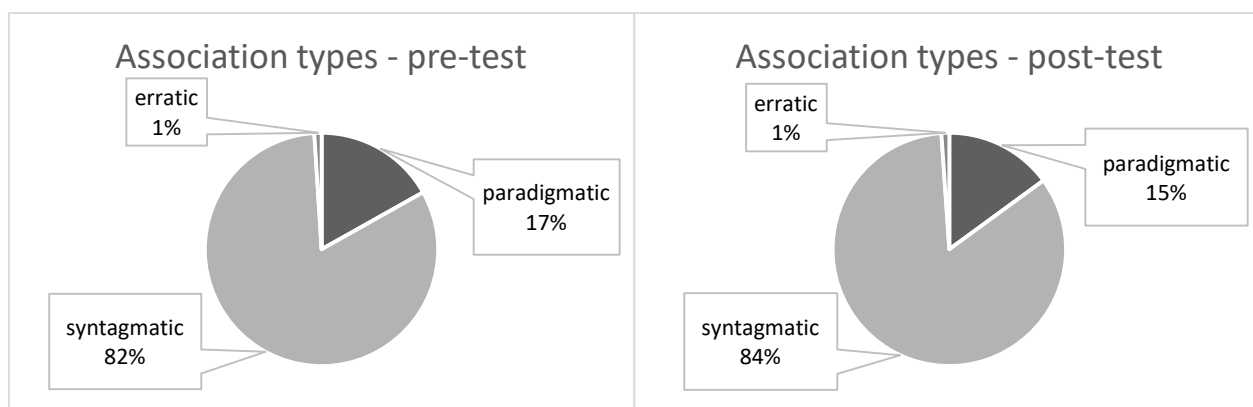


Figure 7: Distribution of association types in pre- and post-test

What is interesting about the different age groups is that no erratic responses were provided by 17- to 18-year-old participants, who also produced the highest percentage of 33% of paradigmatic responses. There was a marginally higher percentage of erratic responses found by male participants, but they also produced a slightly higher percentage of paradigmatic responses in comparison to female learners. Striking 6.5% of responses by

students with three second languages were erratic. However, this subgroup produced the highest share of paradigmatic responses. Due to the sample size, these developments are not statistically significant, however.

Furthermore, it is worth looking at the types of association for each individual stimulus word. In Figure 8, it can be seen that, for most stimulus words, the shares of the three different association types were relatively similar in the pre- and post-test. Especially the association type distribution of the responses to *anger*, *disgust*, and *trust* are nearly the same before and after the teaching interventions. For *fear*, *joy*, *sadness*, and *surprise*, there was a slight change in association behaviour; participants tended to associate even more often syntagmatically in the post-test than in the pre-test. In contrast, *anticipation*, being the stimulus word with the biggest discrepancy between the percentages of erratic, paradigmatic, and syntagmatic associates in the pre- and post-test, elicited more paradigmatic responses after the teaching interventions than it did before. However, there is also a rather big share of nearly 13% of erratic responses to *anticipation*, which is a big part of the reason for the strong decrease in the percentage of syntagmatic associates.

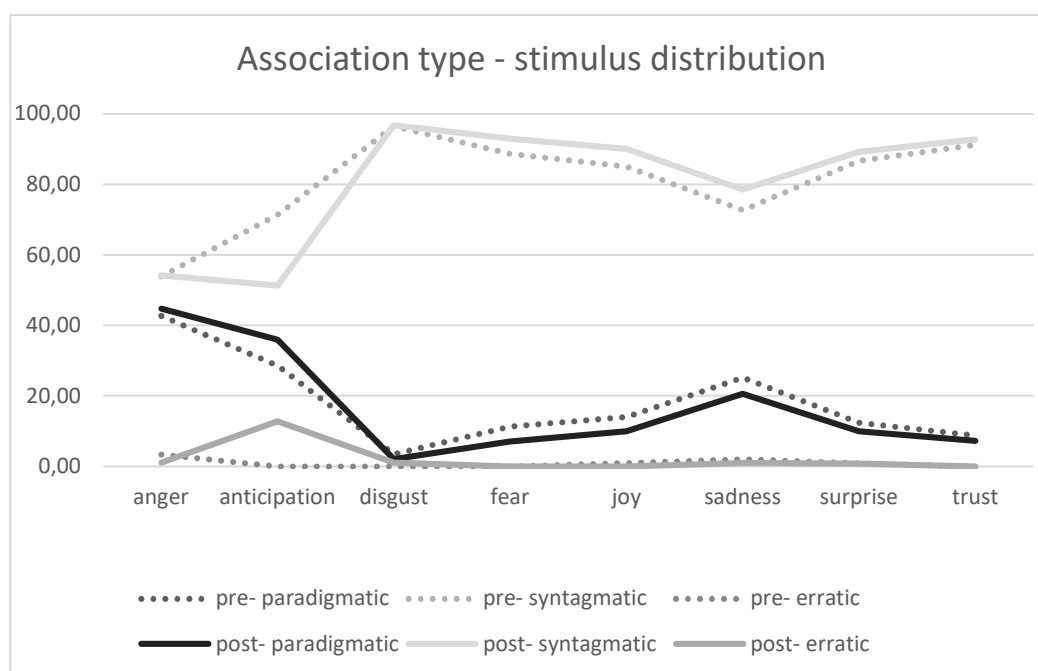


Figure 8: Distribution of association types among the eight stimulus words

The most frequent paradigmatic response to *anticipation* was “excitement”, further examples are “anxiety”, “guess”, and “nervousness”. Syntagmatic associates to this stimulus word are, for example, “Birthday”, “Christmas”, and “rollercoaster”. To *disgust*, the stimulus word with the biggest share of syntagmatic responses, participants often

responded with various food items such as “beans”, “broccoli”, or “spinach” and animals like “spiders” or “snakes”. Only five paradigmatic responses were given to *disgust*, for example, “dislike” or “displeasure”. The stimulus word with the biggest percentage of paradigmatic responses, *anger*, elicited paradigmatic associates like “aggression” and “rage” several times. Syntagmatic responses to *anger* included “people”, “school”, and “war”.

Some syntagmatic responses were part of frequent collocations. For example, many participants either wrote down “dark” or “darkness” for *fear*, as in ‘fear of the dark’. One person associated “issues” with *trust*, as in the compound ‘trust issues’. Particularly many participants associated parts of collocations to *surprise* – “party” was associated 34 times and “Birthday” was associated 51 times, taking the associates from both tests into consideration, making the collocations ‘surprise party’ and ‘Birthday surprise’.

Taking a look at the different groups and the types of associations they produced, it has to be said that a comparison is not meaningful because, as displayed in figure 9, the initial ratio of association types in the pre-test already differed considerably between the four groups and, therefore, the distribution in the post-test was also quite different. Due to the rather small sample of participants, no clear trends or effects of the interventions can be observed, particularly also given the fact that even the control group’s ratio of association types changed from pre- to post-test.

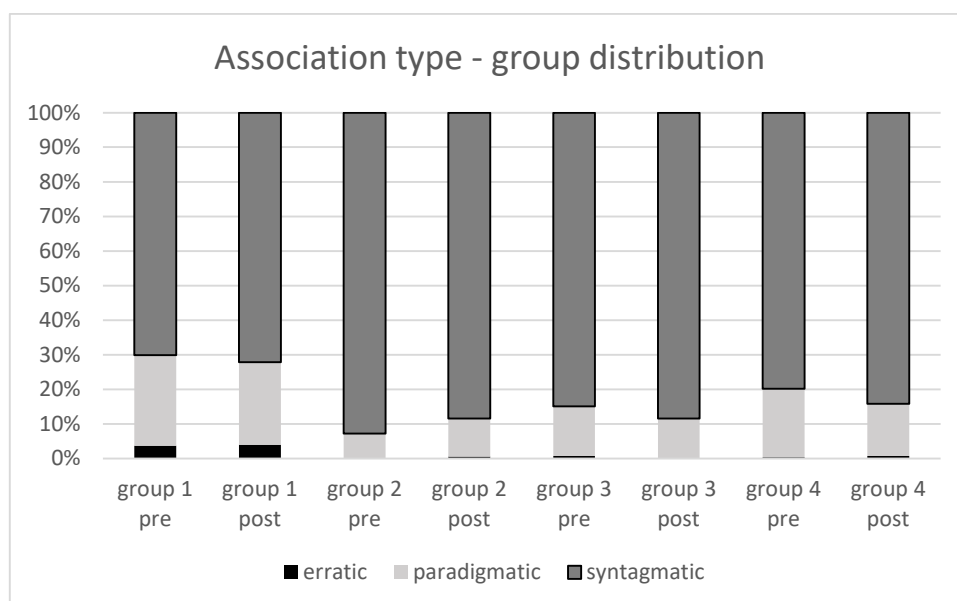


Figure 9: Distribution of association types among groups

What can generally be said about the types of association produced in this study is that the ratio of syntagmatic to paradigmatic responses is rather surprising and unexpected. Previous research claimed that the higher the language proficiency, the higher the share of paradigmatic associations and, also, the better the stimulus word is known, the more paradigmatic associates are to be expected. Considering the age, years of learning English, and level of English of the participants, more than eighty percent of syntagmatic responses appear to be surprisingly high. Furthermore, most of the used stimulus words should be more than familiar to the participants, which makes the higher share of paradigmatic responses to *anger*, and especially to *anticipation*, inexplicable, as one would think that other stimuli such as *fear*, *joy*, and *surprise* would be much easier and more familiar words to ESL learners.

5.5. Emotional causality

When looking at the semantic relationship between stimulus words and responses and analysing whether the responses are either a cause or a result of the given emotions, it was found that, overall, nearly 81% of the responses were causes of the emotions, whereas only 19% of responses were results of the emotions. It ought to be mentioned that, for this analysis, any erratic responses were excluded, as it was unclear how to classify them regarding their emotional causality.

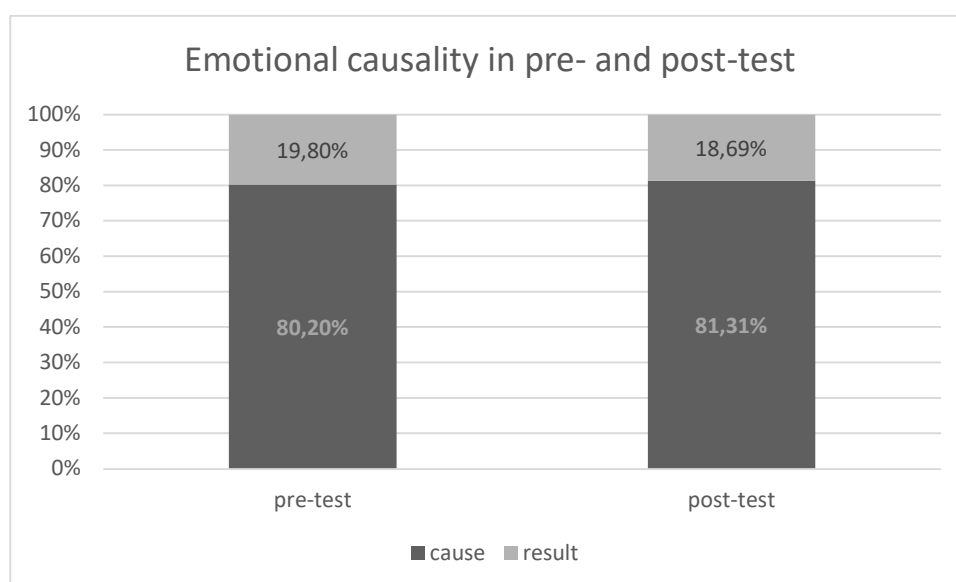


Figure 10: Emotional causality of responses in pre- and post-test

As portrayed in figure 10, this ratio of causes and results of the emotions differs only slightly between the pre- and the post-test. In the post-test, the share of causes of emotions was one percentage point higher than in the pre-test.

What was found for the various demographic subgroups is that the percentage of responses which are results of emotions given by 17- and 18-year-old participants was twice as high as by younger participants. And participants with three second languages associated even three times as many results of emotions as participants with fewer additional languages. Considering a gender comparison, very similar ratios of causes and results were found between male and female participants.

What is remarkable is how the two options of emotional causality are distributed among the types of associations, paradigmatic and syntagmatic associations, which can be seen in figure 11.

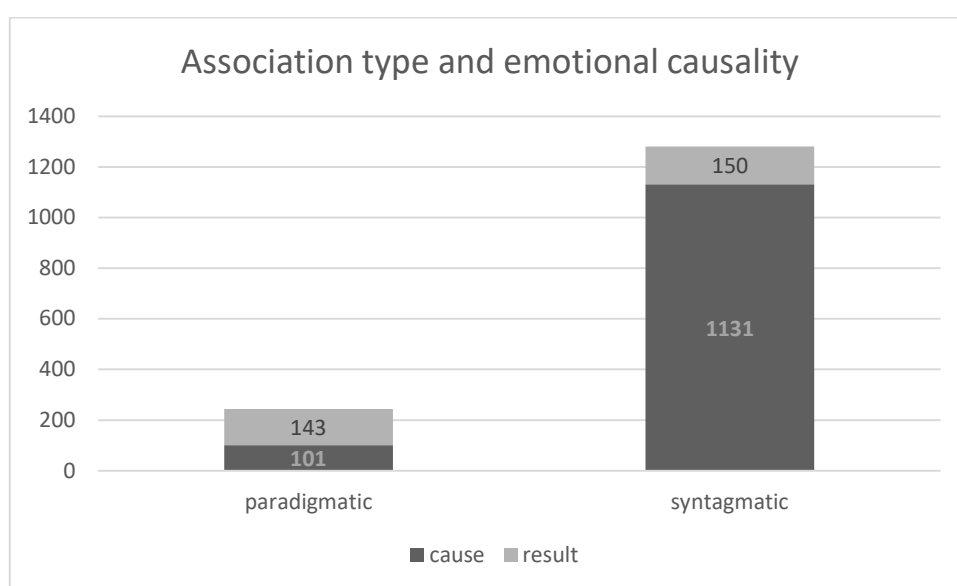


Figure 11: Correlation of the type of association and emotional causality

When looking at syntagmatic associates, striking 88% of the responses were causes of the emotions. Of the paradigmatic associates, however, more than half of the responses were results of the emotions and only 41% were causes.

Taking a look at the emotional causality of the responses to each individual stimulus in figure 12, it can be observed that the share of responses that are results of the emotions was exceptionally low for the emotions *fear* and *surprise* with percentages below 10%. The responses to *disgust* and *joy* are also clearly more often causes than results. The emotions

anger, *anticipation*, and *sadness* elicited about a third of responses that are results of the emotions. When comparing the percentages from the pre-test with the ones from the post-test, it can be stated that the stimulus *sadness* experienced the biggest change with nine percentage points fewer responses caused by the emotion in the post-test than in the pre-test. Most of the figures for the other stimulus words remained almost the same. *Anger* and *anticipation* received a higher percentage of responses that are results of the emotions in the post-test than in the pre-test. However, this change was only by below four percentage points.

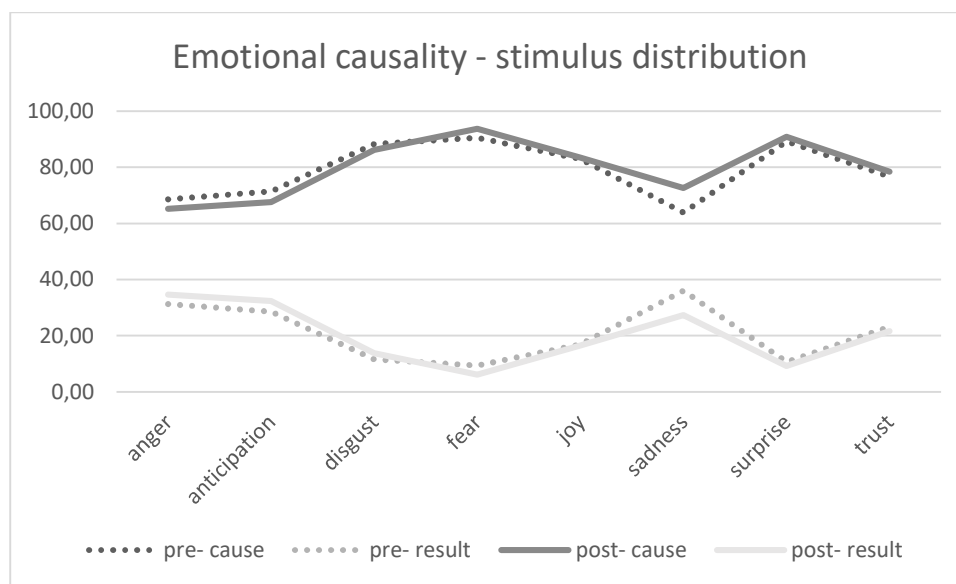


Figure 12: Distribution of emotional causality among stimulus words

The distribution of emotional causality among the test groups in figure 13 shows once again that the groups have a different base level with group 2 being the group with the highest percentage of causes of emotions in the pre-test, as they wrote down about 85% causes. Groups 3 and 4 responded with causes in about 83 and 77 percent in the first test, respectively. And group 1 provided relatively the fewest associations that were causes – only 70%.

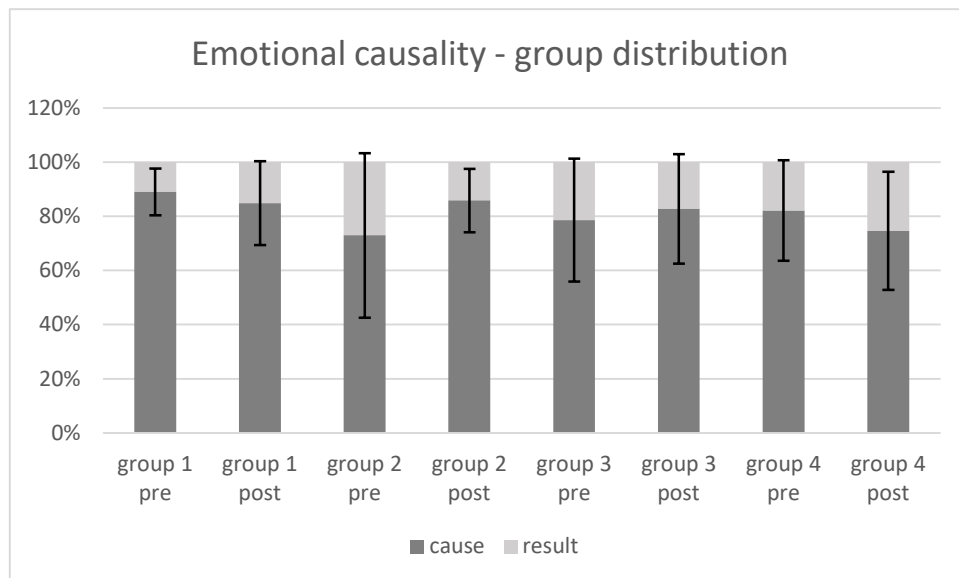


Figure 13: Distribution of emotional causality among groups

In the post-test, groups 2, 3, and 4 produced a higher share of causes than in the pre-test. Group 1 produced a slightly lower share of causes after the intervention. However, there is not statistically significant change. Furthermore, considering the standard deviations shows that the tendency to produce more causes of emotions is present, but the ratio is rather inhomogeneous. Even the smallest standard deviation, the one for group 2 in the post-test, is around 9 percentage points. What appears to be strange at first sight is that some standard deviations reach above the hundred percent mark. This can be explained by the fact that the average percentage is already quite close to the highest possible percentage of one hundred percent, but there are some very low outliers that make the standard deviation rather large and since the standard deviation works in both a positive and a negative direction, it reaches more than 100%. There was one person from group 4 who produced only results of emotions in the pre-test and twelve more participants whose percentage of causes was below fifty percent, but there were 19 questionnaires which exclusively contained causes.

5.6. Concreteness

In the course of the concreteness analysis, the concreteness ratings on a scale from 1 to 5 of the associates as well as of the stimulus words were identified by consulting the list compiled by Brysbaert, Warriner, and Kuperman (2014). The concreteness ratings of the stimulus words can be found in table 8, which shows that seven out of the eight stimulus words are abstract and only the stimulus *surprise* is rated concrete. As emotions are most

likely abstract concepts, the fact that “surprise” was rated as a concrete word might show that it was not considered as an emotion rather than the action of surprising somebody by the raters.

Table 8: *Concreteness ratings of stimulus words*

<i>Stimulus word</i>	Concreteness rating	Abstract/concrete
<i>Anger</i>	2.4	abstract
<i>Anticipation</i>	1.93	abstract
<i>Disgust</i>	2.19	abstract
<i>Fear</i>	2.57	abstract
<i>Joy</i>	2.37	abstract
<i>Sadness</i>	1.82	abstract
<i>Surprise</i>	3.24	concrete
<i>Trust</i>	2.04	abstract

Observing the association responses, it can be noticed that the vast majority of responses are concrete ones. Nearly 80% of all responses were concrete nouns. This percentage did not significantly differ between the two tests. The distribution of the concreteness of responses across the concreteness rating range can be found in figure 14. There are several spikes on the right side of the spectrum, showing the majority of concrete responses. And there is an agglomeration of 144 responses with a concreteness rating of 3.07, which includes nouns such as “time”, “violence”, “loudness”, and “member”, but most importantly the large quantity of occurrences of “friend” and “friends”. The lowest rated associates to the stimulus words, which all have a rating below 1.5, are “hope”, “luck”, “distrust”, and “unknown”. Examples of the 45 responses with the highest possible rating of 5.0 are food items such as “mango”, “apple”, “banana”, and “water”; objects such as “house”, “TV”, and “bed”; and animals such as “snake”, “fish”, “frog”, and “bird”.

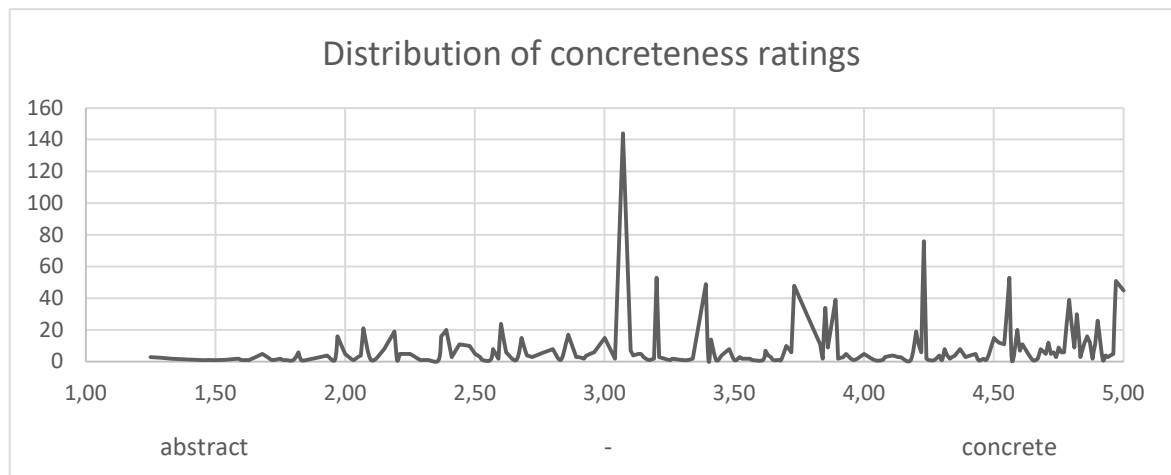


Figure 14: Distribution of concreteness ratings of responses

The difference between pre- and post-test is smaller than one percentage point, with the share of concrete responses being slightly higher in the post-test than in the pre-test. However, there were some changes in concreteness among the associates to the individual stimulus words, as can be seen in figure 15. This figure depicts the average concreteness ratings of the responses to the stimulus words in the pre-test and the post-test as well as the concreteness ratings of the eight stimulus words themselves.

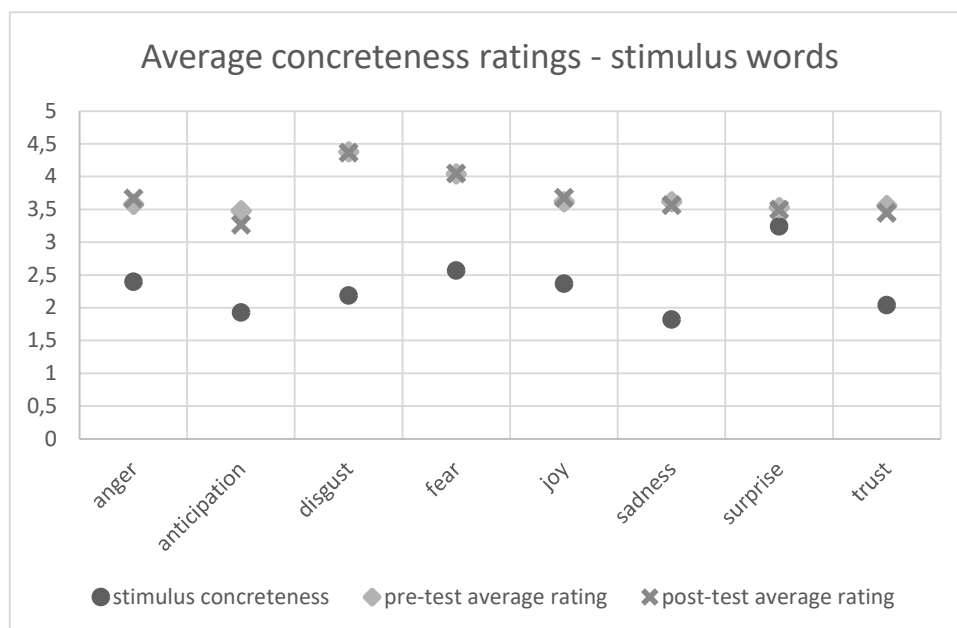


Figure 15: Average concreteness ratings of responses to stimulus words in both tests

The average concreteness ratings of responses to the stimuli *disgust*, *fear*, *sadness*, and *surprise* were almost exactly the same in both tests, while the responses to *anger* and *joy* were slightly more concrete in the post-test than they were in the pre-test. The responses to *anticipation* and *trust*, however, were more abstract after the teaching interventions

than they were before. What the figure above also does is compare the concreteness of the individual stimulus words and the concreteness of their associates. With the exception of *surprise*, whose possibly flawed rating was already mentioned previously, there is only *disgust* as slight outlier from an otherwise rather similar curve of the concreteness of the stimulus words to the curve of the concreteness of the responses to the respective stimuli.

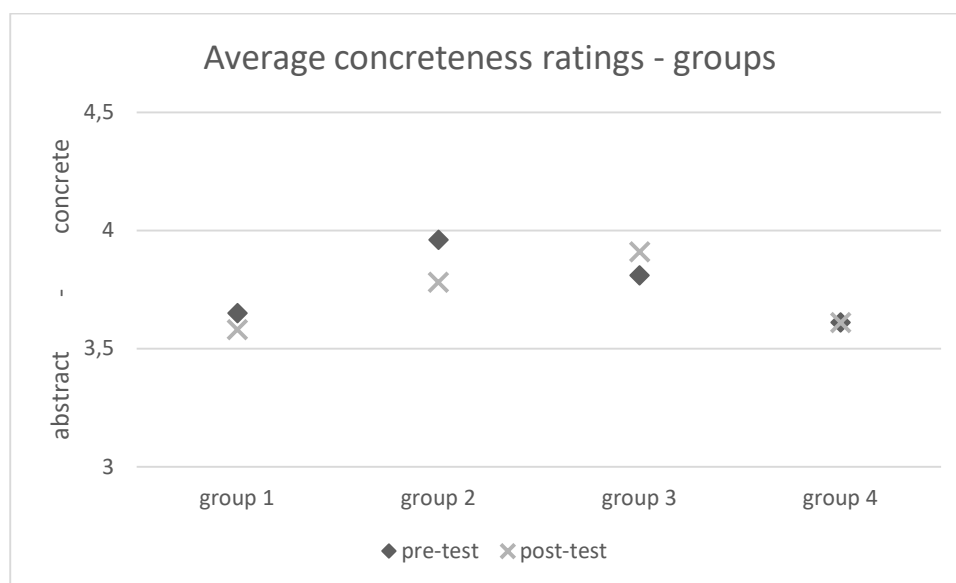


Figure 16: Average concreteness ratings of responses of each group

Figure 16 depicts the average concreteness ratings of the responses each group produced in the two tests. In this analysis, the results of group 4, which was the control group, were exactly the same in both tests. Group 3 wrote down more concrete words in the post-test than in the pre-test. Groups 1 and 2 responded with a bit more abstract nouns after the teaching interventions than they did before, with group 2 as the group with the biggest change. Even though the fact that the control group produced the same average concreteness rating in both tests and all experimental groups' averages experienced a change, no statistically significant difference can be observed.

Taking the participants' age, gender, and language background into consideration, it could be found that younger learners aged 14 or 15 responded with 83%, 16-year-olds with 78%, and older learners aged 17 or 18 with 60% concrete nouns. This slight trend of more abstract association by older participants is also suggested by the average concreteness rating of 3.85, 3.69, and 3.35 by learners aged 14 and 15, 16, and 17 and 18, respectively. However, these findings are not statistically significant. Gender does not seem to affect the concreteness of associates, as very similar responses regarding concreteness by male

and female participants were observed. However, there appears to be a trend of less concrete association by participants with more second languages, as there were 81% concrete responses by participants with zero or one second language, 76% by participants with two second languages, and only 71% by participants with three additional languages. This is also mirrored in the average concreteness ratings of 3.78, 3.66, and 3.55 by the respective subgroups. But due to the small sample size, this cannot be considered statistically significant.

6. Discussion

6.1. Research questions

In this section, the five research questions posed in section two will be answered on the basis of the findings of the study conducted in the course of this research project.

1) Do ESL learners respond with more associates to a word association test after a vocabulary teaching intervention than before?

The study has shown that ESL learners were able to provide more associates in the post-test than in the pre-test. In the test prior to the teaching interventions, 31 percent of the gaps on the questionnaire were left blank. In the test after the teaching interventions, only 27 percent of the gaps remained empty. But not only the mere ability of writing down words improved in the second test, but also the share of valid responses was increased even more: In the pre-test, only 59 percent of possible responses were valid, whereas 67 percent were valid in the post-test. These differences between the pre- and post-tests were found to be statistically significant. However, it has to be mentioned that, due to the rather small groups sizes, there is a considerable standard deviation. The elevated number of responses in the post-test was to be expected, as, according to previous studies (e.g., Zareva, Schwanenflugel, and Nikolova, 2005: 587; Fitzpatrick and Thwaites, 2020: 241), more associates can be produced the more proficient the participant is and the better they know the stimulus words.

What ought to be mentioned, though, is the fact that not only the number of responses given by participants of the three groups receiving teaching interventions was elevated after the interventions, but the control group also produced more responses and more valid responses in the post-test than they did in the pre-test. What was found out about

the different groups is that there was no statistically significant difference between any of the intervention groups or the control group. This might suggest that there was a learning effect of some kind that took place between the two tests regardless of the teaching interventions. Participants might have thought about the stimulus words after encountering them in the first test or they might have even looked them up in a dictionary or online to find out more about them, which might have improved their ability to write down more responses in the second test. This might have happened even though they did not know that they would be asked to associate words to the same stimulus words again. Another explanation for the higher number of responses by all groups, but in particular by the control group, might be the slightly unsatisfactory possibility that word association is not a stable phenomenon, which would make comparisons of pre- and post-tests less meaningful. However, it can also be considered that the mental lexicon is a dynamic and expanding structure, even more so in young language learners.

2) What kind of words do ESL learners associate with stimulus words from the semantic field of emotions?

In general, it can be said that there are rather big meaning set sizes to be observed in the association data of this study. This means that participants wrote down a big range of different words as associates to the eight stimulus words. Overall, there were 400 different words noted down as associates, which is a high number considering that the total number of valid responses is only just below 1600 words. This might be due to the emotional semantic field of the stimuli, as the emotions may have triggered a bigger variation in association because everyone thinks about emotional words in a slightly different way.

However, there were also several words that were associated by numerous participants, which gives them associative strength. With the exception of the stimulus *anticipation*, which is a rather rare, unknown, and difficult word, all stimuli elicited associates with either medium (*anger* and *disgust*) or even strong associative strength (*fear*, *joy*, *sadness*, *surprise*, *trust*). This shows that the group of participants taking part in this study did associate some similar words with the eight basic emotions. And, interestingly, a considerable share of nearly 15% of all associates were actually from the same semantic field as the stimulus words, i.e. the semantic field of emotions. Furthermore, several words

dealing with relationships, both family and romantic relationships, and food items as well as animals were written down by several participants.

3) Are the responses of ESL learners to a word association test more likely to appear on a norms list after a vocabulary teaching intervention than before?

In the analysis comparing the present data with a norms list, i.e., the data of my previous study (Machart, 2018), which was conducted with participants who were university students studying English and were, therefore, rather proficient English users, it was found that there was a small, but statistically insignificant increase of the share of words included in the norms list. About 55 percent of the words associated by the participants of the present study in the pre-test and approximately 58 percent of the responses in the post-test can be found on the norms list. The norms list used for this analysis was compiled by having proficient L2 learners take the same word association test as the participants of the present study did. This process was suggested by Fitzpatrick & Thwaites (2020: 245) as well as by Meara (2009: 25) as opposed to compiling a norms list from L1 user data. The concordance between the collected data of the present study and the norms list might be rather low due to the age difference, as the norms list includes data associated by people aged 20 to 35. Being of a different age group can culturally influence the way participants associate words (Meara, 2009: 25).

There were different developments of the shares of norms list words among the four groups. Starting with group 4, despite being the control group, there was once again a change detected. The percentages of group 4 parallel the previously mentioned overall percentages of 55 percent in the first test and 58 percent in the second test. But groups 1 and 2, the definitions group and the portfolio group, respectively, both increased the share of norms list words after the teaching intervention more than group 4. Group 2 had the biggest change, as the ratio of words from the norms list increased by nearly five percentage points, but it has to be considered that this group started out with the lowest percentage in the pre-test. What is surprising is that group 3, which is the group that watched and discussed an animated film about emotions, produced a lower percentage of words found on the norms list after the teaching intervention than it did before. Again, due to the relatively small sample size, these findings cannot be considered statistically significant.

4) *Are ESL learners more likely to respond paradigmatically than syntagmatically to a word association test after a vocabulary teaching intervention?*

When it comes to the type of association, a rather unexpected development took place. Only one group, group 2, had a higher percentage of paradigmatic associates in the post-test than in the pre-test, the other three groups produced a smaller share of paradigmatic associates in the second test than in the first one. Overall, the percentage of paradigmatic responses shrank from 17 percent in the pre-test to 15 percent in the post-test. In comparison to this, the data from my previous study, which was used as norms list, included more than a third of paradigmatic associates (Machart, 2018).

This development is quite surprising as it was previously found out that paradigmatic responses happen more often if the language users are either older, if they are L1 users, or more proficient in the case of L2 users (Fitzpatrick & Thwaites, 2020: 250). Fitzpatrick and Thwaites (2020: 250) also suggested that the level of familiarity and knowledge of or about a word have an effect on the association type and explained that one is more likely to associate paradigmatically if one knows the stimulus word very well and is able to use the vocabulary item actively. This, however, could be observed in the case of the stimulus word *anticipation*, which was a stimulus word that was rather unknown to most participants in the pre-test, but as it was talked about and explained in all four groups, more participants knew the word in the post-test. That improved knowledge led to an increase of paradigmatic responses by more than seven percentage points. Conversely, though, the stimuli *disgust*, *fear*, *joy* and *trust*, which can be considered very common and easy words, which most certainly are part of all or at least nearly all participants' vocabulary, elicited very low shares of paradigmatic associates.

These findings raise the question of whether all participants, despite being upper secondary students and having had up to ten years of English language instruction, can be considered as proficient as, for example, Fitzpatrick and Thwaites would consider proficient L2 language users to be. The participants associative behaviour seems to suggest that their mental lexicon might still be in an earlier stage of learning the English language and they, thus, produced a high percentage of syntagmatic associates.

Intertwined with the type of association is the emotional causality, which is a particular aspect of the data of this study, as the eight basic emotions were chosen as stimulus words

in the word association test. The majority of responses in both tests were causes of emotions. The post-test even elicited a slightly higher percentage of causes than the pre-test, with causes of emotions being mostly in a syntagmatic relationship to the emotion. In opposition to causes of emotions, there are the results of emotions, which, according to the findings of the present study, tend to be paradigmatically connected to the emotions in more than half of the cases.

5) Do ESL learners tend to associate rather concrete or abstract nouns and does this change after a vocabulary teaching intervention?

In the pre-test, 80.0 percent of the responses to the stimulus words were concrete nouns, whereas in the post-test, 80.8 percent of the associates were concrete. Overall, this appears to show a rather constant level of concreteness in the first and second test. Even though, there were some changes in the experimental groups and the average concreteness rating of the control group's responses stayed the same, there are no statistically significant differences between the groups to be observed. The findings of this analysis suggest that the concreteness of associations is rather stable and, in general, participants tended to associate words which are more concrete than the stimulus words.

6) Which vocabulary teaching intervention leads to the most changes in word association behaviour and are those changes desirable in terms of language proficiency?

An area in which all groups improved from the pre-test to the post-test is the number of valid responses. The difference between the first and second test is statistically significant, which shows that a learning effect has happened across all groups. However, there are no statistically significant differences between any of the groups. The percentage of valid responses of the total number of responses only improved for the three experimental groups, while the control group's percentage declined slightly. The experimental groups' improvement is statistically significant and there was even a significant difference between groups 1 and 2 found.

Due to the small sample size used in this study, the remaining analyses did not result in any statistically significant findings. Also, the rather short duration of the interventions and the generally quite heterogeneous results within the groups are reasons for the lack of statistically significant findings. Therefore, a definitive answer about the intervention

leading to the most (desirable) changes is not possible at this point. What could be found, though, is that the same word association test conducted at two different points in time elicited different numbers of responses, even though the time in between the two tests was only about two weeks. This shows that the mental lexicon is an expanding structure in our brains and that vocabulary repetition is still one of the most central principles for vocabulary learning.

6.2. Limitations

Having conducted this study and analysed the data, a couple of limiting factors have been recognised. First of all, the four groups of students taking part in the study were supposed to add up to 69 participants. However, due to some absences and the fact that both the pre-test as well as the post-tests were required from any one participant to be included in the analysis, only 51 participants' questionnaires could be considered. This smaller number of participants has had an influence on the statistical significance and informative value, especially in the analysis of subgroups. This shrinkage of participants was not to be avoided; however, one could have started with a larger group of participants in the first place in order to end up with more data to be analysed.

A further aspect concerning the groups was that the study was conducted in four groups, three experimental groups and one control group. In the analysis, changes between the pre-test and the post-test in several categories were observed in all four groups. This means that the word association behaviour was different in the two tests even in the control group, which did not receive a teaching intervention in between the two tests. Just like in the other three groups, one participant asked for the meaning of the stimulus word anticipation after the first test, which was provided by another student straight away without the possibility to be stopped. This might have led to better or different results for this particular cue word but there were discrepancies among the other stimuli as well. An explanation for the changes might be a learning effect of some sort or maybe the participants did some research or thought about the stimuli after the first test. It might, however, also mean that there is little predictability of the word association behaviour. But, according to Fitzpatrick (2007: 319), individual participants do tend to respond consistently to word association cues.

Finally, in the course of the analysis, some choices had to be made, which might be somewhat subjective or might leave some room for interpretation, as, for example, the decision of whether an associate is erratic, paradigmatic, or syntagmatic, or whether it is a cause or a result of the respective emotion. These ratings of the types of association and the emotional causality should ideally not be made by only one person but rather by several raters, as it was done on a larger scale in the compilation of the concreteness rating list by Brysbaert, Warriner, and Kuperman (2014).

In hindsight, a couple of factors might have been changed in order to obtain more statistically significant results. Firstly, as already mentioned, a larger number of participants in each group would have been desirable to collect more data. In combination with that, also more stimulus words could have been used. On the one side, more cue words would simply have produced more associates, but, on the other side, cue words from different semantic fields might have also helped understand the way ESL learners associate better. Secondly, the interventions between the two tests could have lasted longer, as this might have made any effects on the associative behaviour stronger. Thirdly, the questionnaire could have included some more general demographic questions about the number of years of English language instruction, as there might be some students who did not learn English in primary school or some students who have repeated a school year. Lastly, more time for explaining the questionnaire and the association task might have prevented misunderstandings such as the definition of a second language or the fact that only nouns were supposed to be written down as associates.

7. Conclusion

The purpose of this research project was to examine the effect different vocabulary teaching interventions have on ESL learners' word association behaviour. In order to determine, which intervention leads to worthwhile and wanted changes in participants' vocabulary and mental lexicon, areas such as the number of responses given, the concordance of responses with a norms list, the type of association, and the concreteness of the responses were analysed before and after three different teaching interventions, which were each implemented in one of three experimental groups. There was also one control group that only took the two word association tests without a teaching intervention in between. The teaching interventions dealt with the semantic field of

emotions in different ways. One group formulated their own definitions of emotions, another engaged with the words by creating a vocabulary portfolio, while the third group watched an animated film dealing with the topic of emotions and discussed it afterwards.

It was found that all three vocabulary teaching interventions had an effect on the number of responses; however, the control group also produced more associates and also more valid responses in the second test than in the first test. Unfortunately, further analyses did not lead to statistically significant results because of a rather small sample size. Therefore, it can not be concluded that any one of the three teaching interventions has a bigger influence on ESL learners' associative behaviour.

With the finding of the improvement of the number of (valid) responses from pre- to post-test in mind, an implication for the English as a Second Language teaching context might be that the repetition of vocabulary items is relevant and beneficial for students' understanding and ability to use them. The skill to come up with more words connected to a topic or a concept is helpful in any second language situation, but especially for written and oral production.

Several aspects around the connection of the topics vocabulary teaching and learning and word association remain unanswered and might be relevant for future research. As the present research project used stimulus words from the semantic field of emotions, the cues the participants were asked to respond to were mainly abstract concepts. An interesting question might be whether the word association behaviour would differ if concrete nouns were used as stimuli. Furthermore, a completely different semantic field could also be used to see if the findings are transferable to other topics. Due to the special position of the rather difficult stimulus word *anticipation* in this study, a combination of easier, mundane words and more advanced, rarer words as cue words could also be of interest.

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9. Appendix

Appendix A – Word association test (questionnaire)

G□ T□

Dear participant,

Thank you very much for taking part in this study. The results of this study are the basis for my master's thesis about word association and vocabulary learning. Please be assured that all data will be treated anonymously and confidentially.

Test ID

Please generate your own test ID here: (if you are unsure of some of the elements, use "X")

the first two letters of your mother's first name		number of your older siblings	the day of your birth	The first two letters of your father's first name	

Personal details

Gender: ☐ female ☐ male ☐ I'd rather not say/non-binary

Age: _____

First language: _____

Second language(s): _____

Procedure

In the questionnaire on the back, you will be presented with terms of emotions. You will then be asked to write down nouns you associate with the given emotion. Please provide **three nouns** for each emotion and try to reply in a spontaneous manner.

Please write down **three nouns** for each emotion and try to reply spontaneously.

1. Anger

2. Anticipation

3. Disgust

4. Fear

5. Joy

6. Sadness

7. Surprise

8. Trust

Thank you for your participation!! 😊

Appendix B – Participants' consent form

Liebe Schüler*in,

im Zuge meiner Masterarbeit an der Universität Wien führe ich eine Studie zur Verarbeitung und Speicherung neuer Vokabeln bei Englisch-Lernenden durch. Diese Arbeit wird am Institut für Anglistik unter der Betreuung von Prof. Julia Hüttner (julia.huettner@univie.ac.at) durchgeführt. Ich bitte dich daran teilzunehmen, um mich beim Abschluss meines Studiums zu unterstützen.

Die Teilnahme umfasst das Ausfüllen von Fragebögen zu Wortschatzthemen und Teilnahme an Unterrichtseinheiten. Die während der Studie erfassten Daten werden anonymisiert und vertraulich behandelt und können nicht auf die einzelnen Teilnehmer*innen zurückgeführt werden. Die Studie wurde von der Schulleitung Mag. Brigitte Schmid genehmigt. Sie wird ausschließlich im Englischunterricht durchgeführt und das Ausfüllen der Fragebögen wird zweimal etwa 10 Minuten dauern.

Wenn du mit der Teilnahme einverstanden bist, unterschreibe bitte am unteren Abschnitt. Bei weiteren Fragen stehe ich gerne zur Verfügung (a01509747@unet.univie.ac.at oder lmachart@hlw-bmdf.ac.at).

Vielen Dank im Voraus
Laetitia Machart, BEd

Ich bin mit der Teilnahme des/der Schülers/Schülerin _____ an der Masterstudie von Laetitia Machart, BEd einverstanden und wurde darüber aufgeklärt, dass die im Zuge der Studie erfassten Daten anonym und vertraulich behandelt werden.

Datum

Unterschrift Schüler*in

Appendix C – List of associates

Anger

Pre-Test	Post-Test
Aggression	Aggression
Aggression	Argument
Aggression	Argument
Aggression	Argument
Apple	Bully
Argument	Danger
Argument	Destruction
Bite	Devil
Bully	Dislike
Danger	Disrespect
Darkness	Emotion
Death	Emotion
devil	Emotions
Disappointment	Enemies
Disrespect	Face
Emotion	Face
Emotion	Feelings
Emotion	Fight
Emotions	Fight
Emotions	Fight
Explosion	Fight
Eyes	Fight
Face	Fight
Family	Fight
Father	Fight
Fear	Fight
Fear	Fights
Feeling	Fire
Fight	Fire
Fight	Fire
Fight	Flame
Fight	Football
Fights	Friends
Fights	Friends
Fire	Friends
Fire	Game
Fire	Gym
Flame	Hate
Friends	Hate
Friends	Head
Friends	Heartbreak
Frustration	Hitter
Frustration	Homework
Gym	Homework

Hands	Hunger
Hate	Impulse
Hate	Jealousy
Home	Lie
House	Lies
Loudness	Lion
Madness	Madness
Marks	Madness
Misunderstanding	Malice
Monday	Marks
Monday	Marks
Music	Misfit
Parents	Monday
Parents	Monday
Parents	Parents
People	Parents
People	Parents
People	People
People	People
Phone	People
Problem	People
Problems	Police
Public Transfer	Punch
Rage	Rage
Rage	Rage
Sadness	Rage
Sadness	Sadness
Sadness	Sadness
School	School
School	School
School	School
School	School
School	School
Screams	School
Siblings	School
Siblings	School
Sports	School
Strike	School
Sunday	Scream
Teacher	Screams
Teacher	Siblings
Teachers	Stress
Time	Stress
Violence	Stress
War	Sweat
	Teeth
	Tension
	Tests
	Violence

	Voice War Words
--	-----------------------

Anticipation

Pre-Test	Post-Test
Anxiety Event Excitement Excitement Fart Film Food Gossip Ground Joy Meat Nervousness Patient People People Pressure Public Results Rollercoaster Speed Time	Advance Anxiety Birthday Bones Christmas Concerts Dinosaur Emotions Events Excitement Excitement Excitement Excitement Excitement Eyes Fear Feelings Flight Grades Guess Hands Happiness Hobby Holiday Holidays Life Party Party People People Presents Spinach Tennis Tennis Things Thoughts Tragedy Wait Winner

Disgust

Pre-Test	Post-Test
Animal	Apple
Animals	Arguments
Animals	Awfulness
Avocados	Banana
Banana	Beans
Bananas	Beans
Beans	Broccoli
Beans	bugs
Bellyache	Character
Broccoli	Cheese
Bugs	Colours
Cheese	Cucumber
Cucumbers	Dirt
Dirt	Dirt
Dirt	Dirt
Dirt	Dirt
Face	Dislike
Family	Displeasure
Fear	Family
Feet	Fight
Fish	Film
Food	Fish
Food	Food
Food	Food
Food	Food
Food	Food
Food	Food
Food	Food
Food	Food
Food	Food
Food	Food
Food	Friends
Friends	Friends
Friends	Insect
Friends	Insects
Frustration	Liar
Grease	Lies
Hate	Love
Looks	Maths
Love	Men
Mango	Mold
Maths	Mouth
Maths	Movie
Men	Mushrooms
Mold	Nature
Mold	Nose

Mouth	Olives
Mud	People
Nature	People
Olives	People
Partner	People
People	Pineapple
People	Pineapple
People	Puke
People	Puke
People	Puke
Pineapple	Reptiles
Poison	School
Politics	Sickness
Puke	Sickness
Rape	Sickness
Rat	Sight
School	Smell
Shit	Smell
Sickness	Smell
Skin	Smell
Smell	Smell
Smell	Smoking
Smell	Snakes
Smell	Snakes
Snake	Snakes
Snake	Sounds
Spider	Spider
Spider	Spider
Spider	Spiders
Spiders	Spiders
Spinach	Spiders
Spinach	Spiders
Sweat	Spinach
Sweat	Spinach
Themes	Stink
Toilet	Sweat
Traffic jam	Sweat
Trash	Sweat
Vegetables	Toilet
Vomit	Toilet
Vomit	Tomatoes
Zucchini	Trash
	Trash
	Vegetable
	Vegetables
	Vomit
	Vomit

	Winter Worm Worms Zucchini
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Fear

Pre-Test	Post-Test
Age	Accident
Animals	Accident
Anxiety	AI
Bed	Animals
Book	Animals
Books	Anxiety
Bungee jumping	Basement
Clowns	Bears
Clowns	Boys
Crocodile	Bungee jumping
Dark	Clowns
Dark	Clowns
Dark	Clowns
Darkness	Clowns
Darkness	Danger
Darkness	Danger
Darkness	Darkness
Darkness	Darkness
Darkness	Darkness
Darkness	Darkness
Darkness	Darkness
Darkness	Darkness
Darkness	Darkness
Darkness	Darkness
Darkness	Darkness
Darkness	Darkness
Death	Darkness
Death	Darkness
Death	Darkness
Death	Darkness
Death	Darkness
Death	Darkness
Discrimination	Darkness
Dolls	Darkness
Exams	Death
Eyes	Death
Face	Death
Fall	Death
Family	Death
Family	Death
Feelings	Death

Fights	Death
Fish	Death
Forest	Death
Fright	Dogs
Ghost	Ears
Heartbreak	Emergency
Height	Emotion
Height	Escape
Height	Exams
Height	Eyes
Height	Fright
Hope	Frogs
Horror	Ghost
Horror	Global warming
Lakes	Heartbreak
Loneliness	Height
Man	Height
Marks	Heights
Men	Hope
Men	Horror
Monster	Insects
Monsters	Insects
Monsters	Loneliness
Mountain	Love
Murderer	Mango
Music	Match
Night	Money
Nightmare	Monster
Ocean	Moon
Overstimulation	Movies
Past	Night
People	Noise
People	Ocean
People	People
Phobia	People
Presentations	Relationship
Relationship	Rollercoaster
Respect	Sadness
Scare	Scare
Scare	School
School	School
School	Sea
School	Sea
Sea	Shadows
Sky	Shark
Snake	Shootings
Snakes	Snakes

Snakes	Snakes
Snakes	Spider
Spider	Spider
Spider	Spider
Spider	Spider
Spider	Spiders
Spiders	Spiders
Spiders	Spiders
Spiders	Spiders
Spiders	Spiders
Spiders	Spiders
Spiders	Spiders
Spiders	Spiders
Spiders	Spiders
Spiders	Spiders
Tests	Spiders
Troubles	Tests
War	Trap
	Uncertainty
	Unknown
	Voice
	War
	Wasps
	Wolf
	Woods

Joy

Pre-Test	Post-Test
Adventure	Basketball
Adventures	Birthday
Animals	Birthday
Animals	Boyfriend
Beach	Boyfriend
Books	Cars
Card Game	Children
Cat	Christmas
Christmas	Christmas
Community	Colours
Concerts	Concerts
Concerts	Dog
Dog	Drives
Dog	Excitement
Dog	Eyes
Family	Faith
Family	Family
Family	Family

Family	Family
Family	Family
Family	Family
Family	Family
Family	Family
Family	Family
Family	Family
Feelings	Family
Food	Family
Food	Family
Food	Family
Football	Food
Freetime	Football
Freetime	Football
Freetime	Forest
Freetime	Freetime
Friend	Freetime
Friend	Friend
Friends	Friends
Friends	Friends
Friends	Friends
Friends	Friends
Friends	Friends
Friends	Friends
Friends	Friends
Friends	Friends
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Friends	Friends
Friends	Friends
Friends	Friends
Friends	Friends
Friends	Friends
Friends	Friends
Friends	Friends
Friendship	Friends
Fun	Friends
Fun	Fun
Fun	Funeral
Funeral	Garden
Games	Gift
Garden	Gifts
Grades	Gym
Gym	Happiness

Happiness	Happiness
Happiness	Happiness
Happiness	Happiness
Happiness	Happiness
Happiness	Happiness
Happiness	Hobby
Health	Holiday
Hobby	Holiday
Holiday	Holiday
Holiday	Holiday
Holidays	Holidays
Laugh	Holidays
Laughter	Holidays
Laughter	Home
Laughter	Ice cream
Life	Laugh
Love	Laughter
Love	Laughter
Mouth	Life
Party	Love
Party	Love
Pets	Luck
Pleasure	Money
School	Money
Sea	Money
Smile	Motorcycle
Smile	Party
Smile	Peace
Smile	Pets
Soccer	Present
Sports	Present
Summer	Rainbow
Summer	Sea
Sun	Smile
Sun	Smile
Sun	Smile
Sun	Smile
Sunset	Smile
Tears	Smile
Time	Smile
TV	Soccer
Vacation	Sport
	Sport
	Sport
	Sports
	Summer
	Sun

	Sun Sun Sunshine Travel TV Vacation Vacation Weather Weekend
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Sadness

Pre-Test	Post-Test
Anger Argument Bed Bed Bird Breakup Breakup Candle Clouds Cry Darkness Death Death Death Death Death Death Death Death Death Death Death Death Death Death Deaths Depression Depression Depression Depression Divorce Emotions Exams Eyes Family	Argument Argument Breakup Breakup Breakup Changes Childhood Contentions Cry Cry Cry Dark Darkness Darkness Death Depression Depression Depression Disappointment Emptiness

Fear	Exam
Features	Eyes
Fights	Friends
Friends	Friends
Friends	Friends
Frustration	Friends
Funeral	Frown
Funeral	Funeral
Grade	Funeral
Grades	Funeral
Grandma	Funeral
Grandmother	Grade
Grave	Grades
Grief	Grades
Hate	Grades
Heart	Grades
Heartbreak	Grades
Heartbreak	Grief
Hole	Grief
Ice cream	Handkerchief
Illness	Heart
Loneliness	Heartbreak
Loneliness	Heartbreak
Loneliness	Illness
Loneliness	Insecurities
Loneliness	Issues
Loss	Life
Loss	Loneliness
Loss	Loneliness
Love	Loneliness
Luck	Loss
Mark	Love
Movie	Love
Movie	Love
Movie	Love
Music	Love
Music	Marks
Music	Money
Music	Movie
Music	Music
Music	Pain
Nothing	Problems
Procrastination	Problems
Rain	Rain
School	Rain
Stress	Rain
Stress	Rain
Tear	Rain

Tears	School
Tears	School
Tears	School
Tears	Songs
Tears	Stress
Tears	Tear
Tears	Tears
Tears	Tears
Tears	Tears
Tears	Tears
Tears	Tears
Therapy	Tears
Tissues	Tears
Voice	Tears
Water	Tears
Wound	Tears
Wounds	Tears
	Tears
	Tissues
	Trauma
	Water
	Water
	Water
	Winter
	Words

Surprise

Pre-Test	Post-Test
Animals	Birthday
Baby	Birthday
Balloons	Birthday
Birth	Birthday
Birthday	Birthday
Birthday	Birthday
Birthday	Birthday
Birthday	Birthday
Birthday	Birthday
Birthday	Birthday
Birthday	Birthday
Birthday	Birthday
Birthday	Birthday
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Birthday	Birthday
Birthday	Birthday
Birthday	Birthday

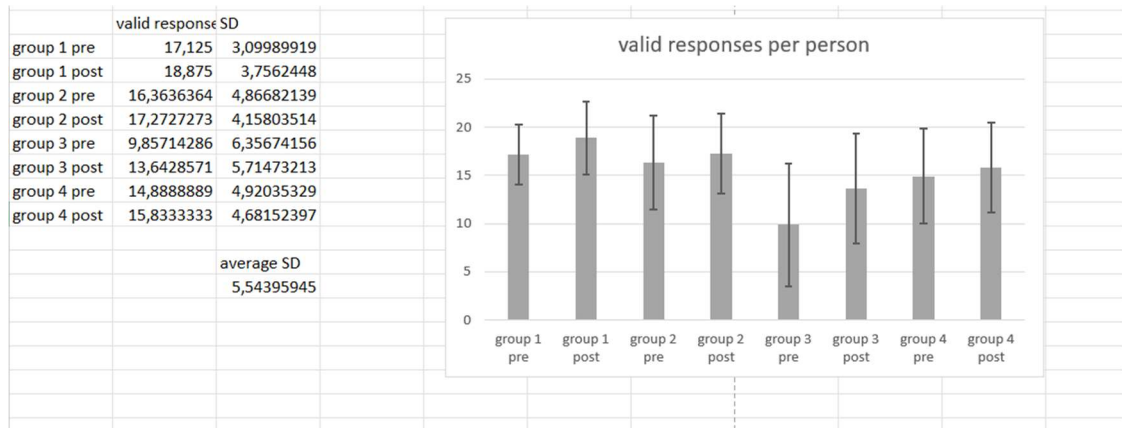
Birthday	Birthday
Birthday	Birthday
Birthday	Birthday
Birthday	Birthday
Birthday	Birthday
Birthday	Birthday
Birthday	Birthday
Birthday cake	Birthday
Boyfriend	Birthday
Boyfriend	Birthday
Cake	Birthday cake
Cake	Boyfriend
Cake	Cake
Changes	Cake
Christmas	Candles
Christmas	Changes
Christmas	Christmas
Day	Christmas
Drinks	Christmas
Eyes	Christmas
Fear	Excitement
Flowers	Excitement
Food	Eyes
Friend	Family
Friends	Films
Friends	Food
Gestures	Friends
Gift	Friends
Gift	Friends
Gift	Fun
Gift	Gift
Gifts	Gift
Gifts	Gift
Grades	Gifts
Happiness	Gifts
Happiness	Glow
Happiness	Grades
Happiness	Happiness
Happiness	Happiness
Happiness	Happiness
Holiday	Happiness
Holidays	Holiday
Laughter	Joy
Life	Joy
Life	Joy
Location	Lights
Love	Mark

Money	Member
News	Money
Notifications	Party
Panic	Party
Parties	Party
Party	Party
Party	Party
Party	Party
Party	Party
Party	Party
Party	Party
Party	Party
Party	Party
Party	Party
Party	Party
Party	Party
Party	Party
Party	Party
Plan	Party
Plot twist	Party
Present	Places
Present	Prank
Present	Prank
Present	Present
Present	Present
Present	Present
Present	Present
Present	Present
Present	Present
Present	Present
Present	Present
Present	Present
Present	Present
Present	Present
Present	Present
Presents	Present
Presents	Present
Presents	Present
Presents	Present
Presents	Presents
Scare	Presents
Secret	Presents
Smiley	Presents
Sorrow	Presents
Vacation	Presents
Wish	Presents

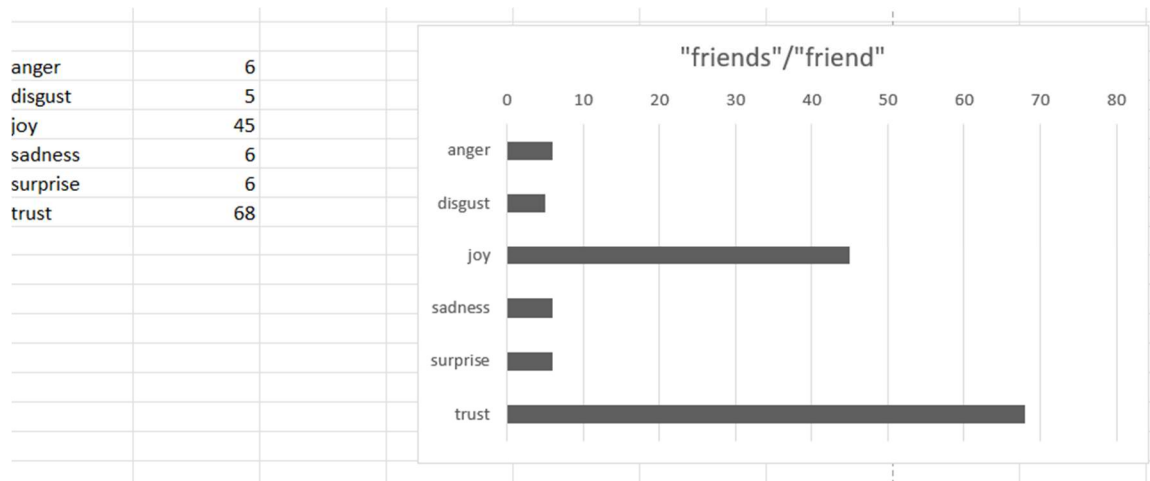
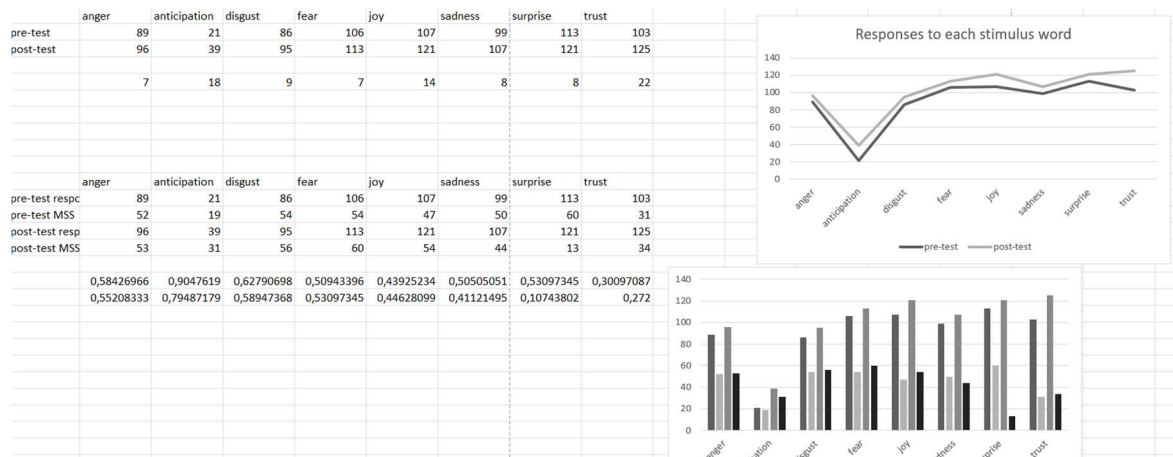
Mother	Home
Parents	Honesty
Parents	Honesty
Parents	Hope
Parents	Hug
Passion	Issues
People	Joke
People	Life
Person	Love
Phone	Lover
Relationship	Mother
School	Mother
Secret	Mother
Secrets	Mother
Secrets	Parents
Self	Parents
Self	Parents
Self	Partner
Siblings	People
Siblings	People
	Pets
	Place
	Problems
	Relationship
	Relationship
	Relationship
	Relationship
	Relationship
	Reliability
	School
	Secret
	Secrets
	Secrets
	Secrets
	Secrets
	Self
	Self
	Self
	Siblings
	Siblings
	Siblings
	Sister

Appendix D – Data analyses

Number of responses



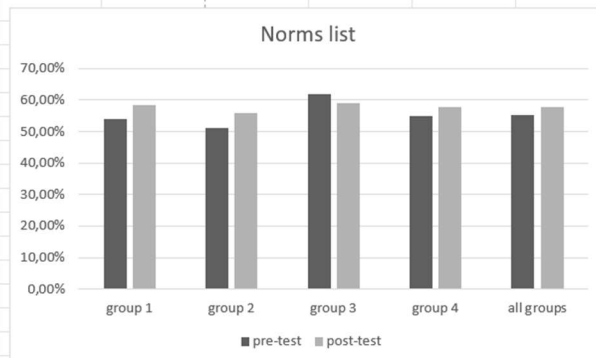
Associated words



Norms list comparison

% on norms list	pre-test	post-test	
group 1	54,01%	58,28%	4,26%
group 2	51,11%	55,79%	4,68%
group 3	61,87%	59,16%	-2,71%
group 4	54,85%	57,89%	3,04%
all groups	55,11%	57,77%	2,66%

	pre	post
anger	11,7647059	19,6078431
anticipation	3,92156863	9,80392157
disgust	17,6470588	13,7254902
fear	29,4117647	33,3333333
joy	43,1372549	45,0980392
sadness	29,4117647	31,372549
surprise	43,1372549	56,8627451
trust	58,8235294	74,5098039



Types of association

		erratic	paradigmatic	syntagmatic	erratic			paradigmatic	syntagmatic	erratic			paradigmatic	syntagmatic	erratic
pre		7	122	595		pre-test		16,85	82,18	0,97		post-test	14,93	83,97	1,10
post		9	122	686								overall	15,833874	83,127839	1,0382868

		erratic	paradigmatic	syntagmatic	paradigmatic	syntagmatic	erratic
anger	pre	3	38	48	42,70	53,93	3,37
anger	post	1	43	52	44,79	54,17	1,04
anticipation	pre	0	6	15	28,57	71,43	0,00
anticipation	post	5	14	20	35,90	51,28	13,82
disgust	pre	0	3	83	3,49	96,51	0,00
disgust	post	1	2	92	2,11	96,84	1,05
fear	pre	0	12	94	11,32	88,68	0,00
fear	post	0	8	105	7,08	92,92	0,00
joy	pre	1	15	91	14,02	85,05	0,93
joy	post	0	12	109	9,92	90,08	0,00
sadness	pre	2	25	72	25,25	72,73	2,02
sadness	post	1	22	84	20,56	78,50	0,93
surprise	pre	1	14	98	12,39	86,73	0,88
surprise	post	1	12	108	9,92	89,26	0,83
trust	pre	0	9	94	8,74	91,26	0,00
trust	post	0	9	116	7,20	92,80	0,00

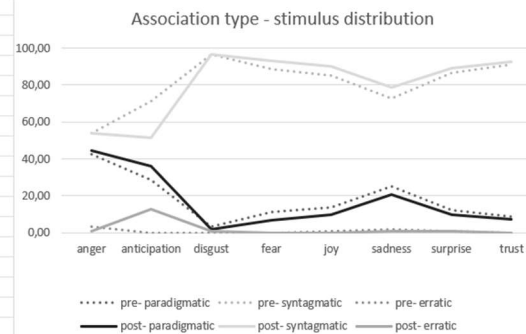
Association types - pre-test

Association type	Percentage
syntagmatic	82%
paradigmatic	17%
erratic	1%

Association types - post-test

Association type	Percentage
syntagmatic	84%
paradigmatic	15%
erratic	1%

	pre-erratic	pre-syntagm	pre-erratic	post-erratic	post-syntagm	post-erratic
anger	42,70	53,93	3,37	44,79	54,17	1,04
anticipation	28,57	71,43	0,00	35,90	51,28	12,82
disgust	3,49	96,51	0,00	2,11	96,84	1,05
fear	11,32	88,68	0,00	7,08	92,92	0,00
joy	14,02	85,05	0,93	9,92	90,08	0,00
sadness	25,25	72,73	2,02	20,56	78,50	0,93
surprise	12,39	86,73	0,88	9,92	89,26	0,83
trust	8,74	91,26	0,00	7,20	92,80	0,00



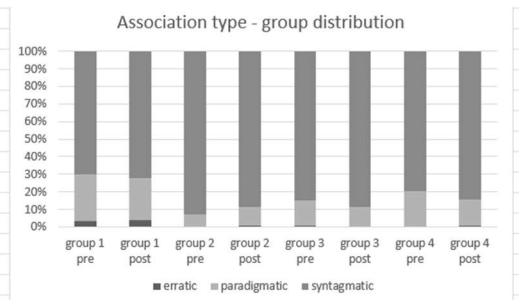
	erratic	paradigmatic	syntagmatic	% para	% syn
4	81	100	43,783784	54,054054	
5	20	35	33,333333	58,333333	
1	5	175	2,7624309	96,685083	
0	20	199	9,1324201	90,86758	
1	27	200	11,842105	87,719298	
3	47	156	22,815534	75,728155	
2	26	206	11,111111	88,034188	
0	18	210	7,8947368	92,105263	

	erratic	paradigmatic	syntagmatic	erratic	paradigmatic	syntagmatic
group 1 - pre	5	36	96	3,65	26,28	70,07
group 1 - pos	6	36	109	3,97	23,84	72,19
group 2 - pre	0	13	167	0,00	7,22	92,78
group 2 - pos	1	21	168	0,53	11,05	88,42
group 3 - pre	1	20	118	0,72	14,39	84,89
group 3 - pos	0	22	169	0,00	11,52	88,48

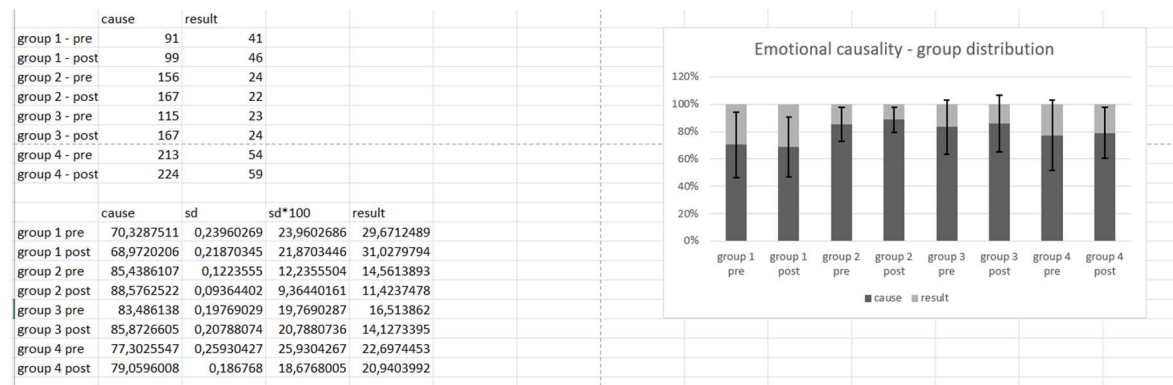
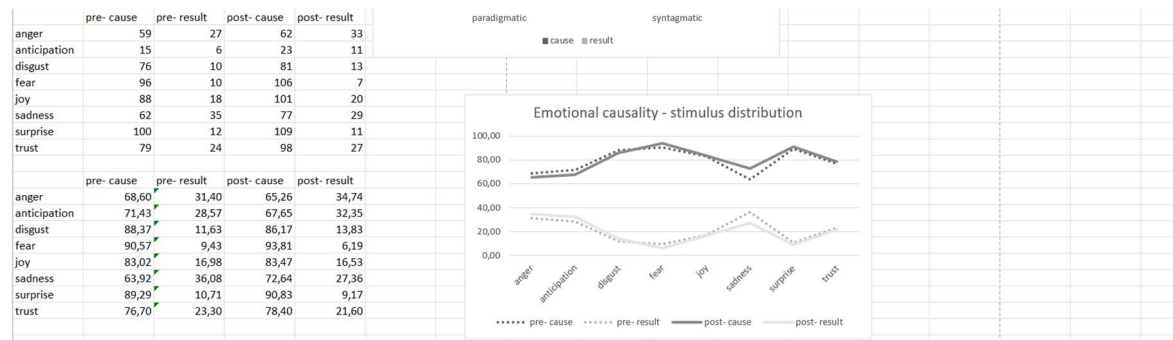
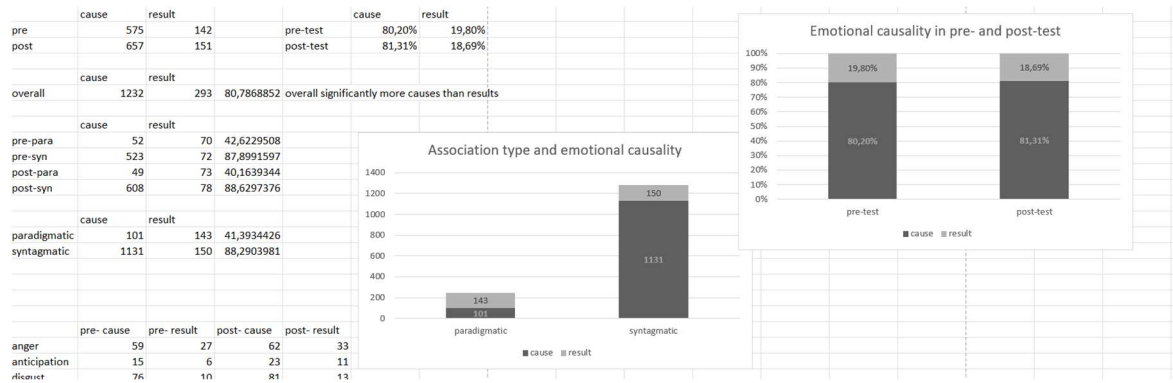
10 erratic responses were given by one participant from group 1

	erratic	paradigmatic	syntagmatic
group 1 pre	3,65	26,28	70,07
group 1 post	3,97	23,84	72,19
group 2 pre	0,00	7,22	92,78
group 2 post	0,53	11,05	88,42
group 3 pre	0,72	14,39	84,89
group 3 post	0,00	11,52	88,48
group 4 pre	0,37	19,78	79,85
group 4 post	0,70	15,09	84,21

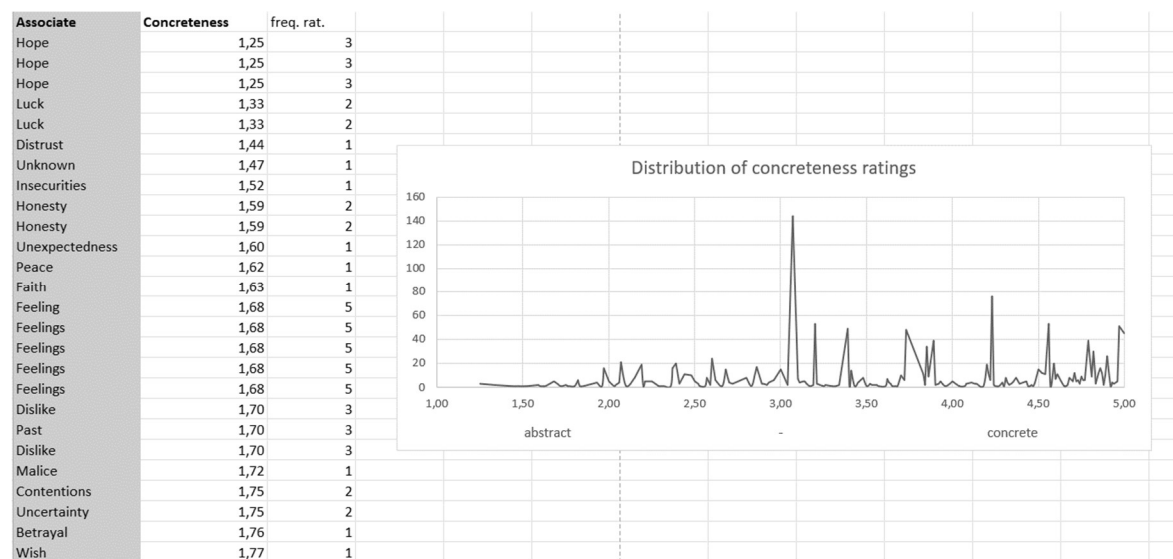
group changes:

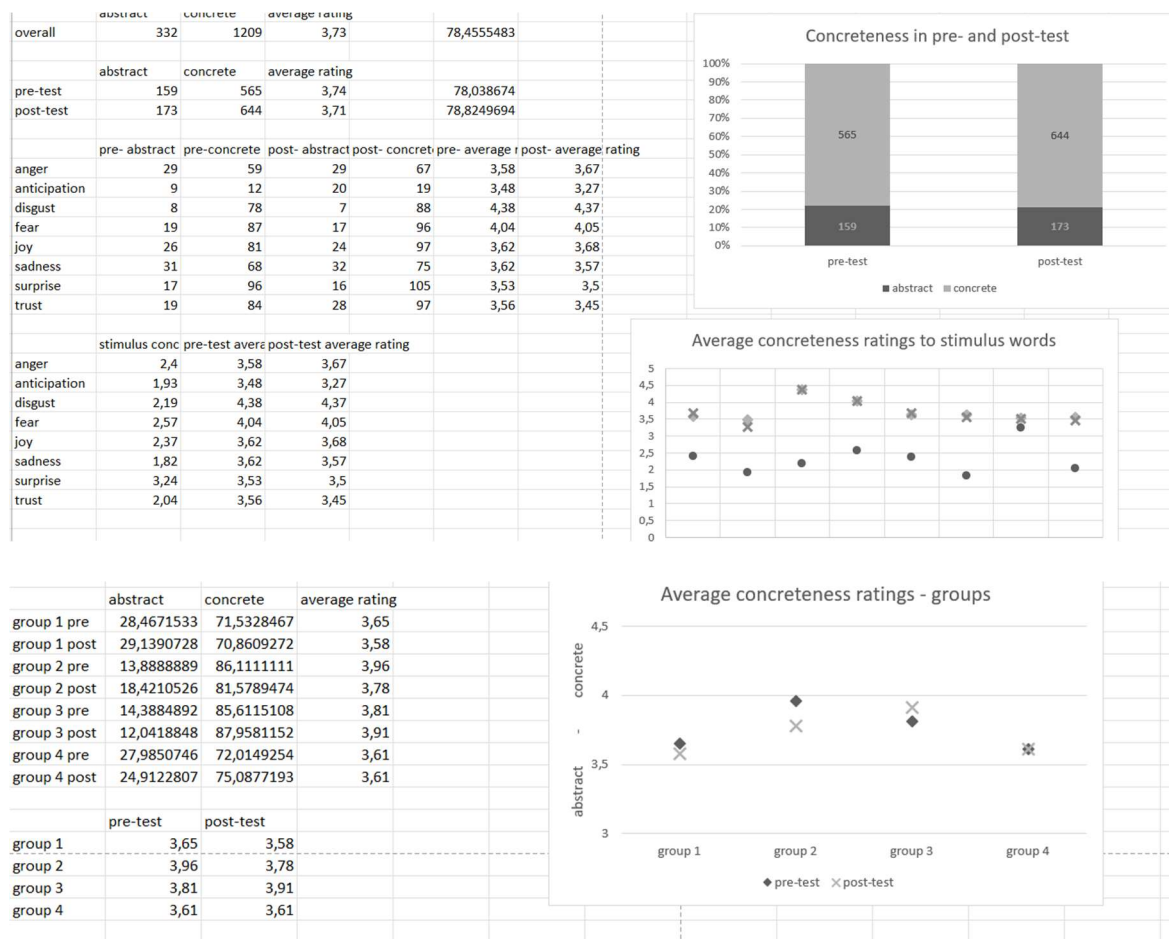


Emotional causality



Concreteness





Appendix E – Abstracts

English

The aim of this master's thesis is to examine the effect of three different vocabulary teaching interventions on ESL learners' word association behaviour. Vocabulary, as an integral part of most second language courses, includes the knowledge of and about words and phrases and their usage in context. For a person to be able to associate words with a cue, it is necessary for them to know more about the relevant words than simply translating them.

In the course of this research project, vocabulary teaching interventions are implemented in between two word association tests with stimulus words from the semantic field of emotions in order to find out in what way they affect, and possibly improve, the participants' word association behaviour in terms of their language proficiency. Ninth- and tenth-year ESL learners at a vocational upper secondary school in Lower Austria took part in this study. The teaching interventions include explicit vocabulary instruction, creating vocabulary portfolios, and watching and discussing a film about emotions.

The main finding of the study is that all three teaching interventions positively affected the learners' ability to think of more associates than before, which shows that repetition is a crucial vocabulary teaching principle.

Deutsch

Das Ziel der vorliegenden Masterarbeit ist es, die Auswirkungen dreier Unterrichtsinterventionen im Bereich des Vokabellernens auf das Wortassoziations-Verhalten von Englisch als Zweitsprache-Lernenden zu untersuchen. Wortschatzarbeit ist ein wesentlicher Bestandteil jedes Zweitsprachenunterrichts und beinhaltet das Wissen von und über Wörter und Wortgruppen und auch deren Gebrauch. Um Wörter zu Reizwörtern assoziieren zu können, ist es notwendig, diese besser zu kennen als nur ihre Übersetzung.

Im Zuge dieses Forschungsprojektes werden zwei Wortassoziations-Tests mit Reizwörtern aus dem Wortfeld Emotionen jeweils vor und nach Unterrichtsinterventionen im Bereich des Vokabellernens durchgeführt, um herauszufinden, wie diese das Wortassoziations-Verhalten der Teilnehmenden in Hinblick auf ihre Sprachkompetenz verändern, oder sogar verbessern. Lernende der neunten und zehnten Schulstufe einer berufsbildenden höheren Schule in Niederösterreich nahmen an dieser Studie teil. Die Unterrichtsinterventionen inkludieren explizite Vokabelinstruktion, das Erstellen von Vokabelportfolios und das Ansehen und Besprechen eines Films über Emotionen.

Die wichtigste Erkenntnis der Studie ist, dass alle drei Unterrichtsinterventionen positiv dazu beitrugen, dass den Teilnehmenden mehr assoziierte Wörter einfielen als zuvor, was zeigt, dass die Wiederholung ein sinnvolles Prinzip der Wortschatzarbeit ist.