

Word Associations

Investigating Links between Words in the Mental Lexicon of Second
Language Learners of English

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1. Introduction

It is an interesting and exciting mystery the way our minds deal with vocabulary. The systems which languages possess seem highly complex. Yet still, our brains are able to cope with all the information. Furthermore, people are capable of not just mastering a first language but also foreign languages. Through various investigations more light has been shed on how we acquire, learn, store, produce and retrieve words. However, there is still more data to be gathered in order to further reveal the intricate ways in which our minds operate.

Nowadays, most researchers agree that our brains must use some kinds of connections between lexical items. It does not seem plausible that our minds can work as dictionaries; it would simply take up too much space and energy. The question is really what links there are and how they work. Furthermore, the connections appear to be more or less strong. Consequently, speculations also arise concerning why some of the links are more significant than others.

A word association test is one method which can be used to explore our minds' vocabulary organization. Through such investigations different kinds of connections have been found. The determined types of associations are accepted by various researchers, although they occasionally use different terms to describe the same phenomena. It is possible to establish strong links in our minds through recognizing patterns and generally common ways to associate in word association tests. Thus, word association tests have laid the basis for models of people's vocabulary networks. Nevertheless, these replicas can perhaps never be regarded as complete and more information would undoubtedly be useful.

Most word association tests have been concerned with how native speakers connect words. Examining how people's first language functions is of course both very important and fascinating. However, in addition to this there is also a need to focus on how second languages work. If information can be gathered on people's second language word stores that knowledge will be highly useful to both learners and teachers of second languages. Moreover, important data concerning similarities and differences in how our brains deal with our first language compared with acquired foreign languages can be collected.

1.1 Aim

The aim of the present investigation is to examine which kinds of word associations second language learners of English might make when they are faced with single words. In addition, a second step will be to look into what similarities and differences there are compared to first language users' word associations based on previous results.

1.2 Material

The primary material consists of a word association test and twenty-six second language learners of English.

1.2.1 Word association test

The test consists of fifty words, where the meanings of most words have been chosen randomly. A random selection of meanings is adequate since the purpose of the study is not to investigate what word associations a specific word triggers, but what kinds of associations are common. Therefore, the vocabulary is aimed to be varied. The selection is, however, not aimlessly picked when it comes to form. Different kinds of word classes and various lengths as well as complexity of words are included. The word classes which are represented in the test are: nouns, adjectives, verbs and adverbs. Some words are selected because they have also been included in preceding word association tests. This will make it straightforward to compare the outcome of this study with previous results. Nevertheless, the words are intended to be easily recognisable by all of the participants since failure to understand the vocabulary will affect the results negatively. Nouns are given in both singular form and plural form. The word association test can be studied further in *Appendix A*.

The choice of word quantity in the test is based on a number which is sufficient to make the outcome trustworthy. A set of fifty words is more than enough to be able to see patterns and draw conclusions. Although a higher number of items would serve the research more evidence, it might also obscure the results and make it impossible to create a reliable analysis in the short amount of time that is set to this investigation.

1.2.2 Participants

The participants in this study are currently attending their final year at upper secondary school. The school is located in a large city in the middle of Sweden. All of the respondents speak Swedish fluently. The students are at least 18 years of age and are consequently qualified to decide for themselves if they want to participate in the research or not. As has been stated before, if the participants are unable to comprehend the given vocabulary the results in the study will suffer. Therefore, the chosen learners have studied English for at least eight years in school and should be able to communicate freely in their second language, according to their course criteria of the preceding year (Skolverket 2000). Consequently, the students have most likely reached a level in their second language where they are able to comprehend and produce numerous words, which is crucial in order for this research to be successfully conducted.

All of the students who are included in the study are anonymous. They are not required nor encouraged to specify their name, gender, age or ethnicity as that has no relevance to the outcome of this survey.

1.3 Method

The word association test is taken by the participants individually, in order for them to not be influenced by each other. They are asked to write the very first word which they come to think of when reading an incentive word. The disadvantage of letting the students read instead of hear the words could be that they have more time to consider and possibly change their minds before they put their pencil to the paper. The advantage of letting the participants read the vocabulary is that they will not be affected by tone of voice, pronunciation and accent. The decision to carry out the entire test in written form is based on the latter argument as well as for practical reasons.

Instructions of how to complete the task are written on the test. There is no focus whatsoever on spelling in this study and this information is also stated on the test, so as not to hinder the participants from writing an association because of fear of a spelling error. As long as the words can be understood without difficulty, spelling is not an issue. There is no time limit for

how long the respondents have to complete the test, although it should not take longer than ten minutes since they are not asked to consider which word to write but only to state the first word which comes into their mind.

The tests are handed out and collected by the students' teacher. The fact that it is the participants' teacher who is responsible for the distributing of the tests will presumably not affect the outcome since the assignment is written and the study is not concerned with observing the respondents.

The word associations given from the students will be counted to see which the most common answers are. Furthermore, this data will be analysed to see what kinds of word associations are made, for instance coordinations and collocations. These expressions will be explained thoroughly along with others in the theoretical background. Although the investigation is not concerned with certain words that are triggered, there is still a need to study the word associations in depth to be able to see general patterns. In addition, consideration is given to how the word associations are connected to the word classes of the incentive words.

Where the participants offer more than one alternative to an incentive word the first association they write is automatically taken as their answer. The reason for this is because it is the partakers' very first word association which is interesting to the results of this survey. An association given in their mother tongue will automatically be seen as no answer. Given that the respondents are asked to give a word association to each word, answers which consist of long explanations will also be seen as no answer. Moreover, when it is impossible or difficult to understand the given association, it will also count as no answer.

The word *stimulus* will be repeatedly used in this essay in connection with word association tests. The word is explained as follows in one dictionary: "A stimulus is something that encourages activity in people or things" (*Collins Cobuild* 2006). In word association tests *stimulus* is used as a term to describe a word which is there to trigger a word association from the participants (Schmitt 2000:38).

2. Theoretical background

2.1 The mental lexicon

Aitchison (2003:5) argues that vocabulary is arranged in some order in our minds, because people have knowledge of a large amount of words and they are able to find them quickly. But, this does not mean that the storage of vocabulary and activation of words is the same thing (Aitchison 2003:10). Ashcraft (1994:290-1) refers to our minds' overall understanding of words, concepts and ideas as semantic memory. More specifically he calls the storeroom and knowledge of words the mental lexicon. In connection, Aitchison gives an in depth definition of the term: "The human word-store is often referred to as the 'mental dictionary' or, perhaps more commonly, as the *mental lexicon*, to use the Greek word for 'dictionary'" (Aitchison 2003:10). The metaphor of a dictionary is, however, misleading. There are rather few similarities between how lexicons and humans store and retrieve words. In dictionaries, the organization is based on alphabetical order, while the mental lexicon's system appears to be far more intricate than that (Aitchison 2003:10-11). Below follows some differences of a lexicon and our human word-store, as they are presented by Aitchison: When human beings recognize and use words they can be affected by their sound structure, stress pattern and stressed vowel(s). Dictionaries, on the other hand, are only concerned with the word's initial letters when it comes to organization. The mental lexicon has the ability to add, change and take away entries; a book-form of a dictionary lacks this capacity. A lexicon deals with words as single units, while our minds compare with other words to create the most meaningful description. People are also able to distinguish between frequently used words and understand different kinds of accents in a language (Aitchison 2003:11-4). Ashcraft says that it is possible that sound features are stored in the mental lexicon, but that it has not been confirmed (1994:291).

McCarthy refers to Channell (1988) who emphasizes the importance of not assuming that the mental lexicon functions exactly the same in a first language as in a second language (McCarthy 1990:34). Biskup touches upon the same issue and points out that some researchers claim that knowing two languages means that one has two separate mental lexicons, whereas other researchers argue that there is one mental lexicon dealing with all languages a person might be familiar with (Biskup 1992:91).

2.1.1 How the mental lexicon works

There are different theories concerning how the mental lexicon actually is built up. Aitchison divides these theories into two major groups: the ‘atomic globule’ theory and the ‘network’ theory (2003:76). This entire investigation is based on the ‘network’ theory, which is why the ‘atomic globule’ theory will not be discussed.

2.1.1.1 Network theory

The network theory is based on the assumption that lexical items create links with each other like a great web (Aitchison 2003:84). Schmitt says that, “[i]t seems logical to assume that these relationships are not just quirks, but reflect some type of underlying mental relationship in the mind” (Schmitt 2000:38). Ashcraft calls the connections between the items semantic relatedness. Two objects are strongly linked in the mental lexicon when the degree of semantic relatedness is high. It takes a short period of time to retrieve a lexical item when the relatedness is high, while it takes a comparatively long time when the relatedness is low (Ashcraft 1994:272-5). Aitchison maintains that both recognition and production of words and meanings in the network are done through activation of several words and meanings. When we want to produce a word we know the meaning and a process starts in the mental lexicon which activates possible word candidates. When we hear a word, we need a meaning and a similar process starts. Depending on if the activated words and meanings have the required characteristics to fit the needed word or meaning they either get chosen or disregarded (Aitchison 2003:224-239).

2.2 Different kinds of associations

Word associations can be organized into categories. Schmitt speaks of three major categories within word associations, namely syntagmatic, paradigmatic and clang associations (2000:39). Another way to approach and analyse word associations can be studied in Aitchison’s *Words in the Mind*. She speaks of four groups which are collocation, coordination, superordination and synonymy (2003:86). Consequently there are two ways in which word associations can be divided. Both approaches have benefits and that is why they are both discussed. Nevertheless, the main focus is on the second method because it is more

detailed when it comes to organizing the word associations. Additionally, Aitchison believes that collocation, coordination, superordination and synonymy are the four most important word association groups, which she bases on replies from word association tests (2003:86). These four terms can, however, be categorised according to the labels of the first method. To get a clear organization of the word associations; collocation, coordination superordination and synonymy are presented under the group which they can be said to belong to.

2.2.1 Syntagmatic associations

Crystal refers to Saussure's findings concerning syntagmatic relationships which show that all sentences are built of sequences of symbols which all add to the meaning of the sentence. The chain of symbols can be seen as a syntagmatic relationship; there are links connecting the words which together create a structure (Crystal 1985:162). Although this study is not concerned with sentence-structure, the syntagmatic relationship ties in with word associations. Connections based on words which are usually linked together, for instance *abandon ship*, are in fact called syntagmatic associations (Schmitt 2000:39). McCarthy explains that syntagmatic associations look at how words come together to create text (1990:159). Consequently, when people give associations syntagmatically they are combining words which, together, create meaning. Syntagmatic relationships are seen as horizontal, since the following words are decided by previous words in the text (Crystal 1985:163 & McCarthy 1990:159).

Syntagmatic associations have a tendency to have a different word class than the stimulus (Schmitt 2000:39). Perhaps this is not strange since in most texts it is common to change word class with every new word. An example of an exception is when we create a compound of two existing words, as in *apple pie*.

The group of word associations referred to as collocations belong to the syntagmatic associations (McCarthy 1990:16). That is evident because, “[s]yntagmatic’ associates are words which frequently collocate with the stimulus item (as in *sell~short*, *red~rose*, *steel~band*, etc.)” (Singleton 1999:135). This can be compared to collocations which act in the same way.

2.2.1.1 Collocation

A collocation is a relationship between words which are associated because they are likely to be found together in context (Aitchison 2003:86). In confirmation of this McCarthy argues that, “[t]he relationship of *collocation* is fundamental in the study of vocabulary; it is a marriage contract between words, and some words are more firmly married to each other than others” (McCarthy 1990:12). This means that some words connect with each other more naturally than others. But the words do not necessarily have to lie just next to each other: “Words that commonly occur with or in the vicinity of a target word (that is, with greater probability than random chance) are called ‘collocates’, and the resulting sequences or sets of words are called ‘collocations’” (Reppen & Simpson 2002:104). This means that deciding whether two words should be labelled collocations or not can be complicated. However, as McCarthy points out, some words are strongly tied together and not hard to distinguish as collocations (1990:12). Carter calls attention to the problem of how to decide what can be called collocation. Any words can in theory come together and collocate. Nevertheless, some words are more likely to co-occur than others. The chances are rather slim of having *guilt* and *mathematics* in connection with each other. On the other hand, the likelihood is great of having *florist* and *flowers* linked with each other in text. A possible approach to solving the problem of which relationships that can be called collocation is to create a set of words which are likely to be found together with a stimulus (Carter 1998:52-3). This will not be done to the fifty stimuli in this investigation, but sometimes a consideration of what is likely to be collocated needs to be done.

McCarthy uses the colour *blond* to illustrate the phenomenon of collocation. *Blond* can almost only be used to describe hair; it is not acceptable to combine *blond* with *car*. Thus, there is a strong bond between *blond* and *hair* and that means that they collocate (McCarthy 1990:12). *Bread* and *butter* are also two words which are often combined; this might lead to the conclusion that they get easily connected because both of the words start with the letter *B* and the phoneme [b]. Nevertheless, words like *knife* and *fork* are just as easily linked, which shows that these items are joined because of their meaning (Ashcraft 1994:291). Aitchison describes some collocation pairs as ‘freezes’ because they have become fixed. She says that *knife* and *fork* is an example of a frozen pair. Idioms and several words combined to expressions are also examples of collocation and tie in with ‘freezes’ since they cannot communicate the meaning without the entire expression (Aitchison 2003:91). Meara and

Nation claim that expressions like *good morning* are so strongly collocated that they are treated like one word by speakers (2002:36). It is therefore no surprise that people often associate such parts of an expression with each other.

Crystal points out that common collocations in languages are often strongly tied to cultural aspects. In for instance English, *green* is connected with *jealousy*. This kind of metaphor cannot be assumed to be found in all languages and cultures. Moreover, other collocations affected by culture are phenomena which actually do exist in reality. One example is how one expresses gone off perishables, *sour* collocates with *milk* but not with *eggs* or *ham* (Crystal 1985:240-1).

2.2.2 Paradigmatic associations

Paradigmatic relationships stand for symbols in a sentence which have links with symbols absent from the sentence but which exist in the given language. This connection means that words in a sentence can be replaced by other words and still keep the same grammatical form (Crystal 1985:162-3). A paradigmatic relationship represents a possibility to choose from more than one word which could be put in the sentence (Crystal 1985:162 & McCarthy 1990:159). The paradigmatic relationship allows the word in the sentence to be substituted in different ways. The most common groups that swap are synonyms, antonyms and hyponyms (McCarthy 1990:16). These terms will be explained in depth further down. Both McCarthy (1990:16) and Crystal (1985:163) display paradigmatic relations as vertical, since there is a choice of swapping a word in a sentence with a not present one. Paradigmatic associations have unlike the syntagmatic associations the same word class as the triggering word, for example *walk-go*. Because the word class is kept the form of the sentence is kept, although the meaning might differ greatly (Schmitt 2000:39-40).

2.2.2.1 Coordination

Coordination is described by Aitchison (2003:86) as words which are linked together because they have the same detail in meaning. Connecting *salt* and *pepper* with each other is an example of coordination as well as linking names of colours together.

Opposites are included in coordination since some opposed words only consist of two components as *left* and *right*. However, there are groups of opposites which have more than one possible opposition. In that case the two most striking opposites can be coordinates like *hot* and *cold* (Aitchison 2003:86). Murphy quotes Lyons (1977) who makes the interesting observation that, “[o]ppositions are drawn along some dimension of similarity” (Murphy 2003:170). This basically means that contrasting words have, as has been noted by Aitchison, the same level in meaning although they are directed in the reverse way.

When investigating oppositions further the term antonymy comes in. Lyons (1981), quoted by Aitchison, defines an antonym as, “a word of opposite meaning” (Aitchison 2003:100). Since there is a degree of likeness in opposition Murphy reasons that, “the line between antonymy and synonymy is a fuzzy, context-sensitive one” (Murphy 2003:168). Thus, it can sometimes be difficult to determine whether a word couple is a demonstration of antonymy or in fact synonymy.

Carter divides antonymic relations into four groups: complementarity, converseness, incompatibility and antonymy. Complementarity means that one word rules out another because the words have no degree, as in *dead* and *alive*. Converseness is a term used for words which correlate with each other, as *buy* and *sell*. The relationship is that if someone buys something then automatically someone else sells something. Incompatibility is when words belonging to the same semantic field exclude each other. Colours and seasons are examples of incompatibility, for instance, if it is July it cannot be August at the same time. The final group is antonymy which can include all of the just mentioned terms or in connection with gradable opposites (Carter 1998:20-21). Lyons (1981), on the other hand, divides antonyms into three groups: Converseness, complementarity (although he uses another term for it) and gradable antonyms (Aitchison 2003:100&263). In this essay Carter’s division of antonyms is used.

2.2.2.2 Superordination

Associations which are put under superordination are connections made by putting words into categories. If *pear* triggers *fruit* it is a connection based on superordination (Aitchison 2003:86). Carter explains superordination in terms of hyponymy. Hyponymy is a bond

between two words where one is specific and the other wide-ranging. A *robin* can be categorised under the general term *bird*. Hyponyms can be said to be unbalanced synonyms, where the organization is hierarchical (Carter 1998:21). Superordinates are sometimes actually called hyperonyms and the items which can be categorised under the superordinate/hyperonym are normally called hyponyms (Aitchison 2003:86-7). The terms superordination and superordinate will be used in this essay. Words can belong to more than one superordination category which means that arranging words in a superordinate way is presumably impulsive (Aitchison 2003:96).

A possibility is that a superordinate triggers words within its category, for instance *pear* given to *fruit*. These items are then called subordinates (Marschark *et al.* 2004:51). This term may be used for any words belonging to a superordinate-group.

There are different views concerning what a relationship of words needs to look like to be considered to have a superordinate bond. According to McCarthy, semanticists only accept a relationship where one item is a kind of representation of the superordinate. In other words a *chair* is a type of *furniture*. The term meronymy is not included in superordination by semanticists (McCarthy 1990:20). Carter includes meronymy under his section designated to superordination (1998:21-2). In contrast Schmitt has a list of sense relations where he includes superordination under hyponymy, but gives meronymy its own heading (2000:26). The expression meronymy, invented by Hasan (1984), refers to part-whole connections, for instance the *clutch* is a part of the *car* (Carter 1998:21-2). It is not always crystal-clear what meronymy actually covers, but the basic assumption is that an item can be divided into smaller parts (Aitchison 2003:106-7). In this essay meronymy is treated as a kind of superordination, because the part-whole relationship can be treated as a hierarchical system.

2.2.2.3 Synonymy

When two words mean exactly the same thing they are called synonyms, as *donkey* and *ass*. However, the term synonymy is used in a wider extent than that because it is not common for two words to mean exactly the same thing. Therefore, words such as *hungry* and *starved* are called synonyms even though the latter term is stronger than the first (Aitchison 2003:94). Carter takes it one step further and says that in reality no absolute synonyms exist; a synonym

always contains a minor difference in meaning compared to its partner/s. This does not mean that synonyms are not exchangeable, but only that replacement of a synonym alters the meaning in a context slightly (Carter 1998:20). Murphy points out that it is common in many cultures to create synonyms for distasteful vocabulary, for instance *bathroom* and *restroom* (2003:40). Thus, the meanings of the synonyms are the same but the formality might alter greatly when choosing one before another.

McCarthy also ponders whether true synonyms really exist. It can be questioned if synonyms always can be put in the same context and produce the same precise meaning (1990:16). Collinson (1939), referred to by McCarthy, gives an example of how the words *start* and *begin* cannot always replace each other: *The baby starts/begins to scream. The car did not begin. Before the world started, everything was black.* In the first sentence both terms can be used, but in the other two we notice that the sentences seem odd because of the choice of the underlined word (McCarthy 1990:16-7). This shows that although words are called synonyms, it is not always certain that it is acceptable to replace them with each other. Murphy explains that there are words frequently referred to as synonyms in dictionaries which are, nonetheless, difficult or impossible to substitute with each other when set in context. Such synonyms are closely connected to some words but not to others. An example of this phenomenon is *heavy traffic* and *thick forest* were *heavy* and *thick* are still to be considered synonyms because of the meaning they transfer (Murphy 2003:156).

A definition of synonyms is given by Schmitt: “*Synonyms* are words that have approximately the same meaning” (Schmitt 2000:1). The word *approximately* is an indication that synonymy does not, in fact, equal mirroring meaning. Murphy notes that similarity is hard to pin down and deciding on words’ correspondence with each other is a continuous process (2003:137). Therefore, many words can be seen as synonyms under the right circumstances.

2.2.3 Clang associations

Clang associations are related to the stimulus when it comes to form but not meaning, for example *save-cave* (Schmitt 2000:39). There are different types of clang associations: Responses which rhyme with the stimulus, have the identical first sound and/or comparable structure of a consonant group are all examples of associations based on clang (Meara

1982:30). McCarthy calls attention to the importance of sound in the recognition of words (1990:35). The beginnings and ends of words seem to be more steadily remembered by our mental lexicon. Especially beginnings of words appear to have a major part when it comes to storing words (Aitchison 2003:138-9).

2.4 Word association tests

Schmitt (2000:38) explains word association tests as a way of looking for respondents' automatic reply to a particular word. This automatically given word is assumed to have the strongest connection with the incentive word in the respondent's mental lexicon. Marschark *et al.* refer to Chaffin (1997) who says that, when subjects are dealing with giving associatives to words presented as single entities the assumption is that frequently given responses have strong connections and familiarity with the triggering word. In addition, words can be called well-known when they generate similar answers from the participants. These kinds of words are also assumed to have organized networks. Replies which are not common are, on the contrary, assumed to have weak links with the stimulus. The reason why these words do not trigger agreeing responses is that the words are not as familiar and do not have well-organized networks. This information about specific words can at least concern the group of people that is being tested (Chaffin (1997) in Marschark *et al.* 2004:53). Schmitt declares that, “[b]y analyzing associations, we can gain clues about the mental relationships between words and thus the organization of the mental lexicon” (Schmitt 2000:38). This means that word association tests can play an important role in research aimed to map the mental lexicon.

2.4.1 Previous results of word association tests

When word association tests were first conducted researchers discovered that there seemed to be recurring words associated to specific stimuli. This information led them to the conclusion that our minds structure vocabulary like a spider's web (Aitchison 2003:84-5). According to Aitchison, early investigators found out three important things about word associations in first languages. Firstly, adults seem to respond with the same form as the stimulus, that is they keep the same word class as the stimulus. Secondly, people seem to prefer to pick a word within the same semantic field as the stimulus: for instance *hammer* is likely to trigger *nail*, *screwdriver* or *saw*. Thirdly, people almost always choose the matching partner to the

stimulus if such one exists: for instance *king* triggers *queen* and *big* triggers *small*. In one early study 1000 people were participating and the results showed that over 75 % of them answered with *girl* to the stimulus *boy* (Aitchison 2003:85).

Schmitt maintains that word association tests have shown that there are patterns and structures as to how people associate. One piece of evidence to this statement is the associations given from 100 British university students to the word *abandon*. If their answers had been randomly picked by their mental lexicons, it is highly likely that there would have been 100 different word associations. Since this was not the case (there were 38 different variations) the conclusion must be that there is a structure in the mental lexicon. As many as 40 % of these native speaking students chose the synonym *leave* to correspond with *abandon*; consequently this cannot be a coincidence (Schmitt 2000:38-9).

In Deese's research (1966) English native speaking students' most frequently given associations were within the superordination group (e.g. *furniture* given to *table*), subordinates (e.g. *table* given to *furniture*) and coordinates (e.g. *bride* given to *groom*). As an overall theme Deese identified how the results were an indication of how people cluster words together logically, in an established manner (Marschark *et al.* 2004:51). Some examples from Deese's findings are *cabbage-vegetable*, *alive-dead* and *accident-car* (Carter 1998:19).

2.4.1.1 Grouping the associations

2.4.1.1.1 Native speakers

Schmitt suggests that the most important result from word association tests is that native speakers seem to go from responding syntagmatically (collocation) to giving more paradigmatic (coordination, superordination and synonymy) responses as their language develops (Schmitt 2000:40). Carter adds that children start the syntagmatic-paradigmatic shift when they are about seven years old (1998:199) In addition, there is a reduction in clang associations as a person gets older (Schmitt 2000:40 & Carter 1998:199). Common to all languages is that adults mostly respond paradigmatically in word association tests (Murphy 2003:40).

According to Aitchison, coordination is the most recurring response in word association tests among first language speakers (2003:86). Further, individuals do not tend to associate according to superordination, because even though the mental lexicon might store words with similar meanings in a group there is not always a name for that cluster. Furthermore, some superordinates have a very formal sense to them and people might consider them unsuitable in certain circumstances, for instance *siblings* used to describe brothers and sisters (Aitchison 2003:96). People do not associate with synonyms very regularly, but they do occur (Aitchison 2003:86). All of the three just stated word associations (coordination, superordination and synonymy) belong, as has been mentioned before, to the paradigmatic word associations. Both Carter and Schmitt say that adults tend to associate paradigmatically (Schmitt 2000:40 & Carter 1998:199). Therefore, if we rely on Aitchison, the most recurrent paradigmatic association is coordination. People also seem to have strong collocational links in the mental lexicon. They are, after coordination, the most frequently used word association. (Aitchison 2008:91).

2.4.1.1.2 Second language learners

There is significantly less information concerning second language learners' tendencies in word association tests compared to first language learners' habits. Although word association tests are useful, startlingly few have been conducted with second language learners. However, studies which have been made show differences in how first language and second language learners associate. Firstly, learners show a greater variety in their answers than native speakers. Secondly, they respond with clang-associations which mostly only native speaking children do. Thirdly and finally, it is common for second language learners to misunderstand stimuli (Meara 1982:30-1). Schmitt refers to Söderman (1993) who investigated tendencies in second language learners of English from Scandinavia. The outcome of that study was in accordance with Meara's findings, namely that learners seem to use clang associations similar to native speaking children. Additionally, the learners appeared to initially respond syntagmatically and as they were more exposed to the target language and/or their knowledge of English progressed they gave more and more paradigmatic associations. This process is similar to the development which native speaking children go through (Schmitt 2000:41).

2.4.1.2 Common word associations

In this section there will be an exploration of some specific stimuli and frequent answers to those. These common word associations are taken from an investigation conducted by Palermo and Jenkins. In their research 1000 college students in the United States were asked to give their initial word associations to 200 words (1964:iii-viii). Furthermore, information presented by Aitchison regarding common word associations will also be included in this section.

The most frequent response to *hungry* was *food* (collocation): over 40 % gave that answer (Palermo & Jenkins 1964:164-5). Aitchison provides the same information, or at least she shows that *food* is the most common response to give to *hungry* (2003:86). Furthermore, the authors give the same information when it comes to pairs. In Palermo and Jenkins' survey can be seen that 65 % of the college students connected *king* with *queen*, which is coordination (1964:179-181). Aitchison writes that results have shown that obvious partners often do get connected with each other in word association tests (2003:85). The colour *red* mostly triggered other colours (coordination) or the actual word *colour* (superordination). *Blood* was the most commonly associated word after the ones just stated (Palermo & Jenkins 1964:242-4); *red-blood* is a collocation. Again, Aitchison shows the same information: *white* comes as the most frequent reply and then *blue*, *black*, *green*, *colour* and in sixth place *blood* (2003:86). To the colour *green*, on the other hand, around 41 % responded with *grass*, which is collocation. In second place, names of colours were represented (coordination) (Palermo & Jenkins 1964:130-2). The adverb *quickly* was mostly met by the synonym *fast*; nearly 42 % of the college students gave that response (Palermo & Jenkins 1964:237-8). One stimulus where Aitchison and Palermo and Jenkins do not show exactly the same results is to the stimulus *butterfly*. Palermo and Jenkins' investigation shows that *moth*, *insect* and *yellow* are in the top three (1964:57-9). However, according to Aitchison, word association tests have shown that the top three associations to *butterfly* are *moth*, *insect* and *wing(s)*. Yet, the word *yellow* is included as the sixth most common reply to *butterfly* (Aitchison 2003:86). These somewhat contradictory results are a demonstration of people's creativeness, which is always a factor present in word association tests. The creativity, which all individuals have, is the reason why not all outcomes show exactly the same information (Schmitt 2000:38).

3. Analysis and Discussion

The results from the word association test will be presented according to the actual number of responses as well as in percent. The total number of participants is twenty-six. The percentage has sometimes been rounded-off to make it more straightforward. At times, results from previous investigations will be included to compare with the outcome from this word association test. Thus, there is an advantage of having the data in percent. To clarify further some results are shown in figures and tables and are then calculated according to the actual number of students, in other words not according to the percentage. In *Appendix B* all of the word associations given to each stimulus can be studied.

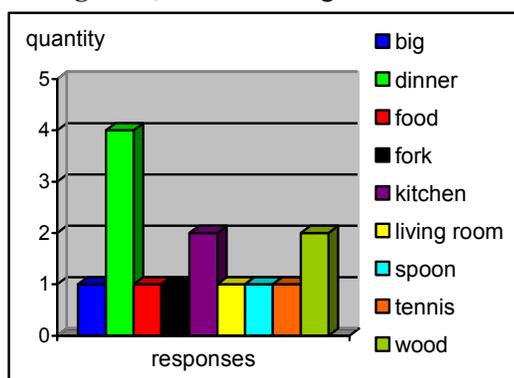
3.1 Syntagmatic associations

Taken as a whole, most of the associations made are syntagmatic associations. As a reminder: syntagmatic associations are based on how words are linked together to create meaning (Crystal 1985:162 & McCarthy 1990:159). One stimulus which triggered plenty of syntagmatic associations is *drive*. Fifteen of the participants, close to 58 %, replied with *car* to *drive*. These two words could for instance create a sentence like: *He drives the car*. This example shows that *drive* is followed by *car* in certain contexts, which means that the two words have a syntagmatic relationship. A syntagmatic relationship is regularly referred to as a horizontal relationship (McCarthy 1990:159). Thus, the syntagmatic connection of *drive* and *car* is an obvious one. In addition, Schmitt maintains that most syntagmatic associations consist of differing word classes, for instance, a verb together with a noun as in *drive-car* (2000:39). Yet, there are an ample amount of syntagmatic associations made in the test which belong to the same word class. For example, the stimulus *cameras* generated participants to answer with *photo*, *photos* and *pictures*. The incentive *cameras* is evidently a noun and the same can be said for the mentioned word associations. Here follows a possible context which the stimulus and the associations could be in: *Cameras can take photos/pictures*. Consequently, the stimulus *cameras* has the same word class as its syntagmatic associations. Thus, it cannot be assumed that all word associations which have the same word class belong to paradigmatic relationships.

3.1.1 Collocation

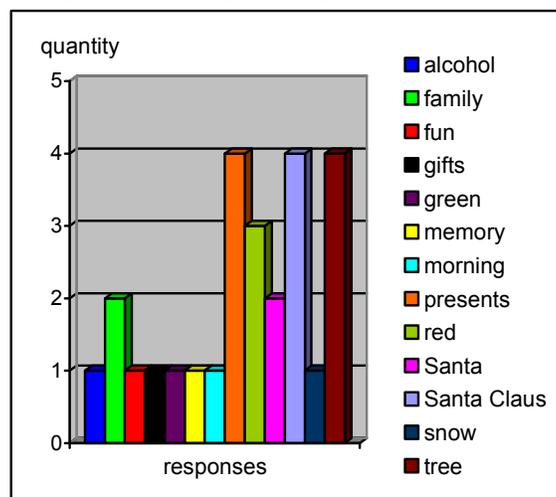
Overall, many of the students have given collocational associations, even though they might not be the same words that are given to the same stimulus. McCarthy deals with this issue: “[P]eople respond in consistent ways, even if the words they respond with are different, in word-association tests” (McCarthy 1990:39). In support of this; in this word association test the word *table* triggered many familiar collocations, but in varying combinations. Four participants wrote *dinner* as in *dinner-table*, two replied with *kitchen* as in *kitchen-table*, two with *wood* presumably as in *wooden-table*, one wrote *living room* as in *living room-table*, one gave *tennis* as in *table-tennis* and finally one person wrote *spoon* as in *table-spoon*. In total, twelve of the participants, circa 46 %, answered with frequently used collocations in everyday speech. That being said, some of the other responses to *table* can also be argued to be collocations. Perhaps they are not as regularly applied in daily conversation as the ones just mentioned, but it is still an indication of collocation having an important role in these second language learners’ mental lexicons. Other associations to *table* which can be argued to be examples of collocation are *fork* and *big*, see *Figure 1*. In total, counting both the very frequently used collocations and the not so common ones, the total collocational responses to *table* were fourteen, close to 54 %.

Figure 1, collocations given to table



An additional example of how the participants in this test tended to create collocations using different kinds of words is to the stimulus *Christmas*. Basically every association given to *Christmas* has to be called collocation. All of those associations can be seen in *Figure 2*.

Figure 2, all responses given to *Christmas*



Perhaps some of the collocations made are more straightforward than others. But when considering all of them in terms of what collocation stands for, the conclusion must be that they all are collocational word associations. As Reppen and Simpson point out, words which occur in the same context as the stimulus with higher likelihood than just by chance can be called collocations (2002:104). Therefore, associations in this situation which might seem far-fetched are more plausible when bearing in mind the circumstances around Christmas. Take the association *alcohol* for instance. At first glance *Christmas* and *alcohol* might not seem very likely to coincide in context. But, the reality is that it is common to drink alcohol during the Christmas holidays, eggnog being one of such alcoholic beverages. Moreover, *family* and *fun* are plausible candidates to co-occur with *Christmas*. The general public spends holidays together with friends and family and presumably enjoy themselves. Thus, *alcohol*, *family* and *fun* are collocations to *Christmas*. Perhaps they are not as clear-cut examples as *Santa Claus* and/or *tree*, but they are not just randomly chosen either. Carter highlights the fact that handling collocations is indeed based on likelihood, which makes many suggestions of collocation complicated and difficult to pin down (1998:52). Hence, based on the reasoning above, in the case of *Christmas* the conclusion is that in this word association test 100 % of the respondents gave a collocation.

Furthermore, there are plenty of examples as well when continuing with stimuli which triggered unanimous collocations. For instance *hungry* was followed by *food* as the first word association from eleven participants, around 42 %. In Palermo and Jenkins' study the same collocation gave almost the same percentage (1964:164-5). Furthermore, in Aitchison's list

over the ten most frequent associations given to *hungry*, *food* is at the top (2003:86). This suggests that, for both native speakers and second language learners, *hungry* and *food* often are strongly connected. In view of the fact that eating is one of humans' basic needs it is perhaps no surprise that *hungry* generates *food*. The reality of having a great deal of identical replies to one stimulus is a sign, according to Chaffin (1997), that *hungry* has a well-established network in the mental lexicon (Marschark *et al.* 2004:53). However, it appears strange that *food* is more tightly bonded to *hungry* than *eat* is. Merely one respondent answered *eat* to *hungry*. However, instead there were a number of partakers who replied with specific kinds of foods such as *hamburgers*, *sandwich* and *pancakes*. The question is then what makes *food* and different types of *food* collocate stronger with *hungry* than *eat* does by these second language learners. Before that issue is handled further another result needs to be introduced.

Connecting with the last paragraph, the subject of *food* related associations continues. To the stimulus *eat* there were eight respondents, nearly 31 %, who replied with the recurring association *food*. Moreover, there were also participants who were precise and gave names to specific kinds of food such as *salad*, *hamburger* and *potatoes*. Altogether there were only two respondents who gave *hungry* in connection with *eat* and one person who wrote *starving*. These two adjectives are synonyms and are therefore in this context treated the same. The stimulus *eat* has, therefore, almost exactly the same kind of consequence as *hungry*. Both of the stimuli produced an abundance of the word *food* and, moreover, particular types of food. Further, neither *hungry* nor *eat* activated especially many associations of each other.

Although, *eat* and *hungry* can be said to belong to the same semantic field they differ in their word class. Yet, since they belong to a specific semantic field they trigger the same types of associations. An early discovery within word association tests is that adults tend to choose an association which belongs to the same semantic field as the stimulus (Aitchison 2003:85). Returning to the question why *hungry* collocates more strongly with *food* and similar than *eat* does, in these learners' mental lexicons, it becomes clear that also the following question needs to be formulated: Why does *eat* collocate more strongly with *food* and similar than it does with *hungry*? It appears as though the most plausible answer and solution to this dilemma is more straightforward than it might seem at first sight. Reconsidering Chaffin's (1997) discussion, of how a stimulus which triggers agreeing word associations from the respondents is a sign of a well-known and well-organized network on behalf of the stimulus,

another conclusion can be drawn (Marschark *et al.* 2004:53): It appears highly likely that when a stimulus produces harmonizing word associations it might not always be because the stimulus has a well-structured network, but because the triggered word association has it. The suggestion is, thus, that in this case it is actually *food* which possesses the familiar and well-organized network in these learners' mental lexicons. This being said, there are of course heaps of cases where it is the stimulus which has the structured network and therefore generates unanimous associations. Yet, it is important to keep in mind that it is also a possibility for the associations to possess well-developed networks.

To the verb and stimulus *spend* fourteen of the students, around 54 %, replied *money*. This is certainly a frequently used collocation in everyday life; therefore, it is not surprising that the participants' mental lexicons chose that word. Yet, another word which can just as easily be connected with *spend* is *time*. But not a single respondent gave that item to correspond with *spend*. Thus, even though there are two natural partners suitable together with *spend* one is totally disregarded. This seems to come into McCarthy's marriage contract theory; some words have a tremendously well-built relationship, which entails them getting very easily connected (1990:12). Consequently, *spend* and *money* have arranged an extremely tight bond with each other in these second language learners' mental lexicons. The reason why *spend* and *time* have not done the same thing will have to remain a mystery.

To the word *accident* exactly half of the students (thirteen) responded *car* (a few of the responses read *car accident* and *car crash*). This is a clear example of a collocated association. Deese's results (1966) also showed that this association is common (Carter 1998:19). This collocation can be analysed in terms of culture. Since the participants in this survey live in a Western-European society they are used to traffic and accidents happening because of it. Car accidents, especially, are common tragedies occurring in traffic. Therefore, it is not surprising that numerous respondents answered with *car* to the stimulus *accident*. As Crystal indicates, things which take place in our surroundings are often mirrored in our collocational associations (1985:241).

Another collocation made, which ties in with culture, is the stimulus *jealous*. As has been put forward by Crystal, some words are strongly collocated in some languages. He mentions the word *jealousy* in English which is steadily connected with the colour *green* (1985:240-1). Three respondents, about 11.5 %, have in fact replied with *green* to *jealous*; however, four

students, almost 15.5 %, have instead written the colour *black*. This might seem strange to a non-Swedish-speaking reader, due to lack of knowledge concerning this language and culture. The colour *green* is connected to *jealousy* in Sweden and Swedish, but so is *black*. There are two possible ways to express *jealousy* in Swedish: *avundsjuka* which is the general term and *svartsjuka* which is used for describing jealousy concerning mainly love-matters. *Svartsjuka* is a word consisting of two parts, where the first part, *svart*, actually is the Swedish equivalent to *black*. Thus, it is not strange that both *green* and *black* were given as associates to *jealous*. This confirms Crystal's belief of how language and culture affect collocation. This is also an indication of how much influence one's first language has on one's second language. Saying that *black* collocates with *jealousy* in English is simply not possible which some of these participants might not be aware of.

Continuing with colour-related associations; in *Figure 3* and *4* can be seen all the word associations based on collocation given to the stimuli *green* and *red*.

Figure 3, collocational responses given to *green*

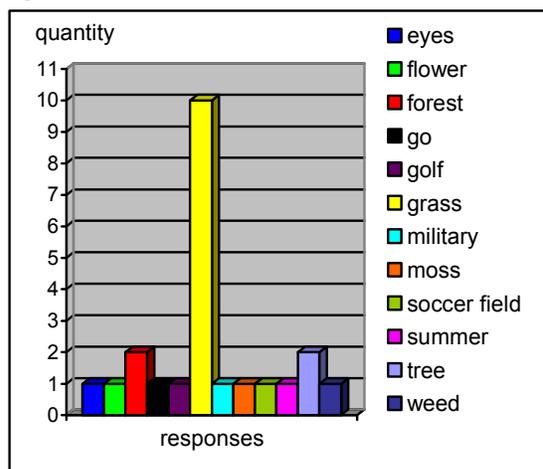
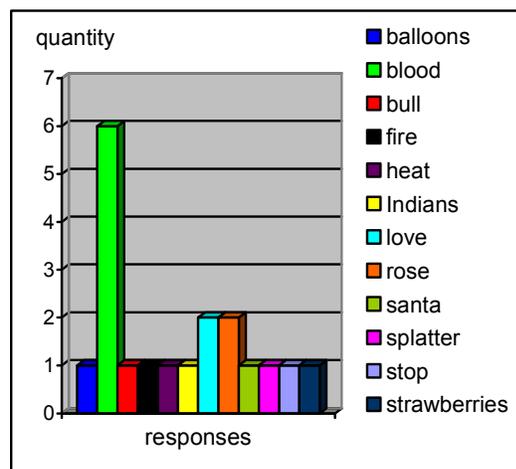


Figure 4, collocational responses given to *red*



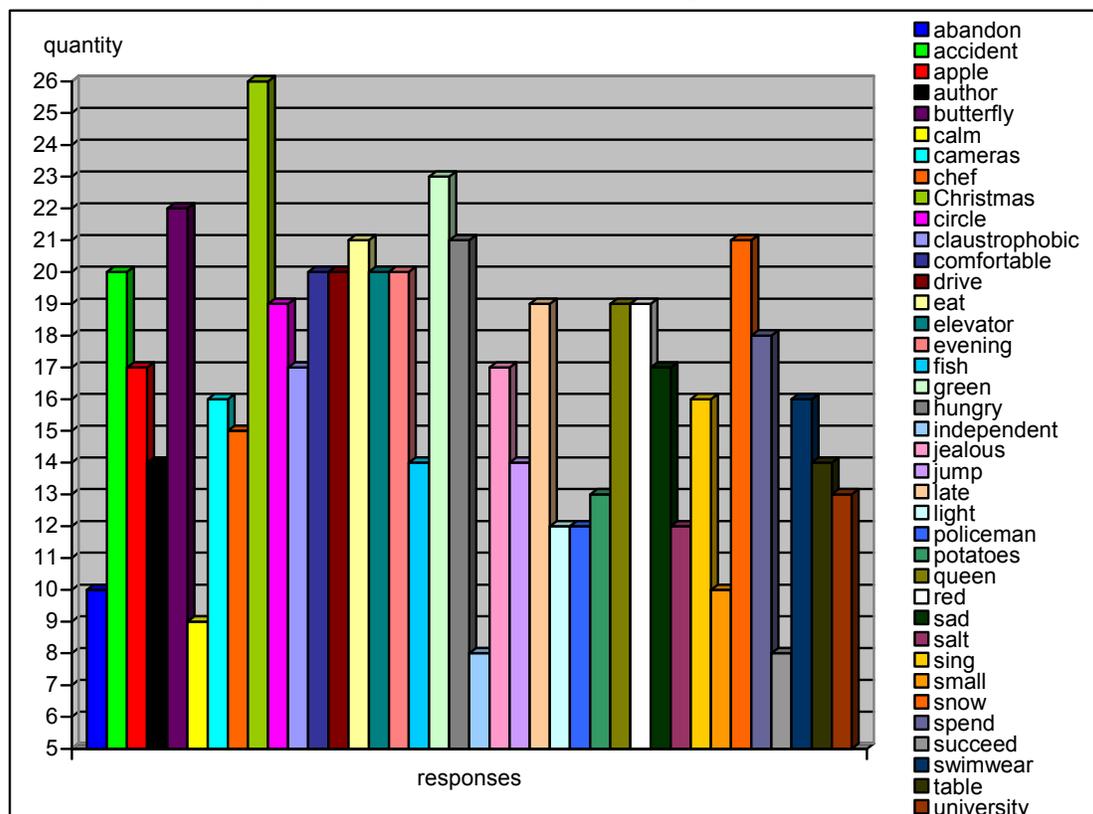
As can be seen in *Figure 3*, to the colour *green* all but three respondents gave a collocation. *Grass* was the most frequently given association, ten participants or circa 38.5 % gave that association. These are similar results to the outcome of Palermo and Jenkins' study where 41 % gave the same collocation (1964:130-2). Examples of other responses in this test to *grass* are *forest*, *tree*, *soccer-field* and *golf*. Altogether this means that a staggering 88.5 % of the partakers gave a collocation to *green*. When comparing this outcome with the associations made to the stimulus *red*, it becomes clear that these learners are inclined to create

collocations when faced with colours. To *red* the word associations based on collocation were in total 73 %, with *blood* being the most frequent one. This contrasts with what both Aitchison (2003:86) and Palermo and Jenkins (1964:242-4) demonstrate; they show that coordination is the most commonly given word association to *red*.

Furthermore, the participants have described stimuli with names of different colours. To the stimulus *policeman* five of the students, around 19 %, responded with the colour *blue*. Again an association is related to cultural aspects; in Sweden the police force have blue uniforms, consequently this has to be the reason why the participants have written *blue*. The noun and stimulus *apple* also aroused specific colours from the participants, namely *green* and *red*. In total 31 % of the replies to *apple* were colour-related. Moreover, the stimulus *butterfly* gave highly interesting results. Five of the students wrote *colour* and four other students responded with names of specific colours, namely *pink*, *blue*, *yellow* and *purple*. This means that nearly 35 % of the students' first connection with *butterfly* had something to do with colour. This outcome is opposed to both Palermo and Jenkins' results and Aitchison's summary of the most frequent responses to *butterfly*. Their findings show that *moth* and *insect* are the two most common associations. In this test merely one person has given *insect* to *butterfly* and not a single one has written *moth*. Thus, these learners seem more inclined than native speakers to associate stimuli with different kinds of colours. All these collocational colour-connected associations are a sign of the second language learners' inventiveness. Meara calls attention to learners' tendency of responding with greater variation compared to native speakers, even though the learners must have a less developed mental lexicon of the specific language (1982:30-1). Consequently, the participants in this investigation describe the stimuli in a way which most native speakers do not seem to do very often.

Finally, the list of associations based on collocation appears to be endless. Hence, in *Figure 5* is demonstrated all stimuli which predominantly produced collocations. On the whole, it is the significantly high number of thirty-eight stimuli (out of fifty) which mainly triggered collocation, which is 76 %. The lowest amount of collocations a stimulus has, which is still enough to dominate above the other word associations, is eight collocations, nearly 31 %, given to *independent*. The stimulus *Christmas*, which was dealt with thoroughly above, has the highest number of collocation responses at twenty-six which evidently is 100 %.

Figure 5, all stimuli which mainly triggered collocations



3.2 Paradigmatic associations

A paradigmatic relationship is a connection between a word in a context and its possible substitutes absent from the context (McCarthy 1990:16). On the whole there were not nearly as many paradigmatic associations as there were syntagmatic associations made in the word association test. This goes in accordance with Söderman's findings and conclusions (1993), namely that learners associate syntagmatically and when their second language is more advanced they start giving more paradigmatic associations (Schmitt 2000:41). Murphy claims that all adult speakers around the world tend to respond with paradigmatic associations in tests (2003:40). The outcome of this survey shows that that statement can only be true for native speakers. Nevertheless, of the produced paradigmatic associations in this test, coordination and synonymy stood out. There were very few cases of superordination made by several participants to the same stimulus and neither were there especially many random examples.

3.2.1 Coordination

Aitchison points out that researchers a long time ago established that people tend to choose a word's natural partner, if one exists (2003:85). In this word association test the participants were faced with the words *queen* and *brother*. The traditional companions to these terms are, of course, *king* and *sister*. These two coordination pairs are examples of complementarity; antonyms which have no degree and are, therefore, clear opposites (Carter 1998:20). For instance, if someone is a sister that ultimately means that she cannot be a brother. The results from this survey shows that 27 % (seven students) replied with *king* to *queen*, while nearly 35 % (nine students) responded with *sister* to *brother*. These responses both represented the largest agreeing answers for these stimuli. However, in Palermo and Jenkins' investigation as much as 65 % of the students gave *queen* to *king* (1964:179-181). Furthermore, the quantity of coordinations given to *queen* in this test is not sufficient enough to exceed the collocational responses to the same stimulus. The conclusion which can be drawn is that there are reasonably strong coordinational links in these students' mental lexicons when it comes to obvious spouses. But still, collocation seems to have a firm grip of the apparent pairs.

Another coordination duo which perhaps is not as evident as the ones just mentioned is *cat* and *dog*. Fourteen of the students, nearly 54 %, wrote *dog* in relation to *cat*. This association is an example of what Carter calls incompatibility, in other words two items which belong to the same semantic field have a bond (1998:20-1). An additional example of incompatibility is that of *salt* and *pepper*. In this word association test eight people, nearly 31 %, replied with *pepper* to *salt*. That was the most unanimous suggestion to *salt*. However, that is still less than all of the collocations made to the same stimulus. Taking into account Lyon's (1977) utterance about opposites being alike on some level (Murphy 2003:170); it becomes evident that even though *cat-dog* and *salt-pepper* are antonymous they still contain a degree of similarity. Both *cat* and *dog* can be put under the superordinate *animal*, which means that they are on the same level in meaning but spreading in different directions. Turning to *salt* and *pepper* it becomes plain that there is not a self-evident candidate to connect the items in shape of a superordinate. However, this does not imply that *salt* and *pepper* cannot be arranged in a group in the same fashion as *cat* and *dog*. The mental lexicon might store semantically related words together, but there is not always a title for that group (Aitchison 2003:96). Consequently *salt* and *pepper* belong to the same bundle, but there is no joint name for the set. Returning to the *cat-dog* association there is a clear indication of how the participants'

mental lexicons have chosen coordination before superordination. The superordinate *animal* can probably not be considered an example of a grandiose uniting word. Aitchison observes that unnecessarily pretentious-sounding superordinates can get disregarded in favour of more informal coordinational pairs (2003:96). Thus, coordination based on incompatibility is chosen in the case of the *cat* stimulus although there is a straightforward and regular superordinate accessible, namely *animal*.

The stimulus *hope* can evidently be understood as either a noun or a verb. It seems as if most of the respondents have interpreted the word as noun and subsequently created coordination with their associations. The coordinations made based on *hope* appear to have *a feeling of* in common. As one might have a feeling of *hope* one can also have a feeling of *joy* and *trust*. These types of coordinations are not apparent opposites. But, they are coordinations in the same way as *salt* and *pepper*. That is to say, they are connected because they have the same detail in meaning (Aitchison 2003:86). Additionally, their detail in meaning is not only due to *a feeling of* but in addition they can all be said to be positive phenomena. The association *dream* is the exception of *a feeling of*, but it is still a coordination to *hope* since they are both positive verbs. In *figure 6* can be seen all the coordinations made to *hope*, where most of them have in common *a feeling of something positive*. The division between coordination and other responses to *hope* is almost 54 %; this is illustrated in *figure 7*.

Figure 6, all coordinational responses given to *hope*

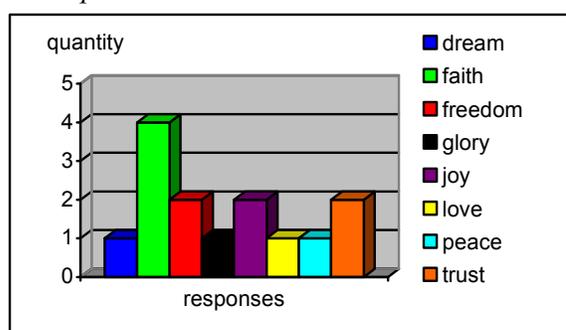
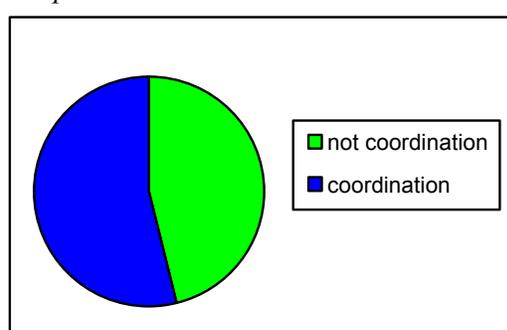


Figure 7, division of responses given to *hope*



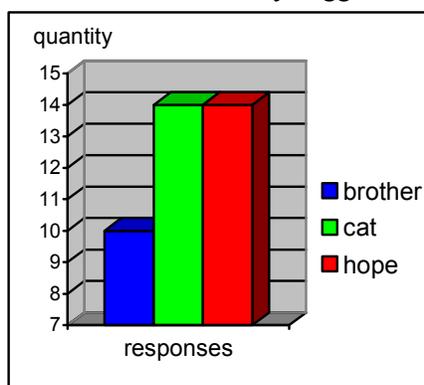
In other word association tests names of specific colours have very often triggered names of other colours. Especially the colour *red* seems liable to produce associations based on coordination in the shape of labels of other colours (Palermo & Jenkins 1964:242-4 & Aitchison 2003:86). As was discussed in section 3.1.1 Collocation, *red* mostly triggered collocations and specifically in the form of *blood* in this word association test. There were

actually only four participants, roughly 15 %, who corresponded with a word for a different colour to *red*. Remarkably, all of them chose the same colour, namely *blue*. Murphy speaks of colours in terms of contrast and points out that some colours are more striking opposites than others. She refers to Ogden (1967) who claims that *red* and *green* are true antonyms because they oppose each other in the so called colour wheel. However, *red* and *green* contrast with other shades of colour as well even though they are not exact opposites (Murphy 2003:191&194). Taking this information into consideration it is fascinating that no one responded with the 'true antonym' (*red* and) *green* to the stimulus *red*. Moreover, the same goes for when *green* was the incentive; nobody responded with *red*. However, two students actually associated yet again with *blue*. Hence, *blue* seems to have established itself as a strong contrast to other colours. Taking into account that coordination, or specifically another colour, was not most of the students' initial association to *red* and *green*, the conclusion must be that the colour coordinations do not seem strong enough to match those of collocation.

Meara emphasizes the fact that native speakers' and second language learners' responses occasionally differ greatly. One reason to this is that learners are prone to misinterpret stimuli (1982:30-1). It is, of course, difficult to verify that strange associations are due to misunderstandings. One case in this test which causes confusion is a response given to the stimulus *chef*. A total of four students gave the word *boss* in reply to *chef*. At first glance, this seems to be a perfect example of coordination. The words link together in that they have the same detail in meaning, but are used in different contexts. However, since the word *chef* in Swedish can be unswervingly translated into English using the word *boss* the case gets complicated. The question is whether the four respondents have understood the meaning of the English word *chef* or if they have understood it in terms of the Swedish word *chef*. One aspect which suggests that they have correctly understood the stimulus is the fact that on Swedish television they are currently airing the television-show Hell's Kitchen. In this programme they consistently call the person in charge of the kitchen *chef*. It is evident that there are those among the participants who are familiar with the programme because of the responses *Hell's Kitchen* and *Gordon* (Gordon Ramsay is the show's main character). Therefore, it seems highly likely that the respondents who wrote *boss* are accustomed to the English meaning of *chef*. Nevertheless, this association shows the occasional complexity of determining the origin of some word associations.

Conclusively, there were solely three stimuli in the whole test which primarily produced associations based on coordination. This result is conflicting with Aitchison’s emphasis of coordination being the most important and recurring type of word association in word association tests (2003:86). However, she does not specify if second language learners are included in that generalization or not. According to the outcome of this test, learners can evidently not be involved in that overview of word association tendencies. In *Figure 8* can be seen the trio of stimuli which mainly triggered coordination. It is clear that these stimuli do not have as strong advantage compared to some of the stimuli which mostly activated collocation.

Figure 8, all stimuli which mainly triggered coordination



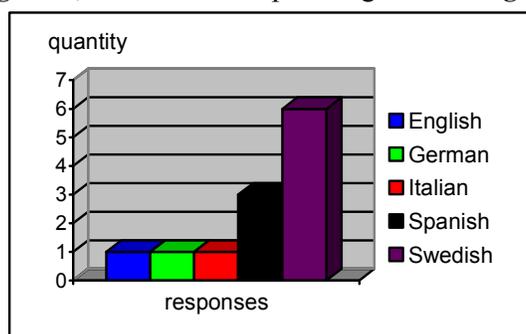
3.2.2 Superordination

Aitchison says that word associations based on superordination are not frequently made in tests. Even though people tend to group semantically related words together there are not always joint names for all of those sets. Naturally there are exceptions to this rule, the superordinate *bird* being one of them. The words *robin*, *blackbird* and *blue tit* can all be fitted under the term *bird* (Aitchison 2003:96). Stimuli in this test which actually have an obvious superordinate gathering a cluster of subordinates together are *apple*, *table*, *green* and *red*. The apparent superordinates are, of course, *fruit*, *furniture* and *colour* respectively. Thus, here is an excellent opportunity to investigate the second language learners’ inclination to associate superordinatively. To *apple* two participants gave *fruit* while no one’s first association with *table* was *furniture*. To the two colours only two participants replied with the superordinate *colour* and both of those responses were given to *red*. Consequently, although there is a collective name for a cluster the respondents in this test do not tend to use it. This is not in

agreement with the students' answers in Deese's investigation (1966). In that test one of the most frequent ways to associate was by giving a superordinate to a stimulus (Marschark *et al.* 2004:51).

Continuing to subordinates; the participants were more willing to give a subordinate to a superordinate than vice versa. To make this clearer, the students were sometimes shown a superordinate and responded with subordinates. Nonetheless, there were not very many examples of those either. Yet, one stimulus which did trigger associations based on superordination was the uniting word *language*. A total of twelve students replied with a specific language to the stimulus. This means that about 46 % of the responses to *language* are subordinates. These word associations can be studied further in *Figure 9*.

Figure 9, subordinate responses given to *language*



Swimwear is another superordinate which activated subordinates. That being said, collocational links were more common to this stimulus, even though superordination presented itself with a high percentage. Two participants replied with *bathing-suit*, five with *bikini* and one respondent wrote *goggles*, which in total is around 31 % of the total responses to *swimwear*.

There is merely one more subordinate given to a superordinate in this test; one participant gave the association *cod* to the stimulus *fish*. A reason why there are few subordinates produced in this test can be due to a lack of superordinates given as stimuli. But, as Aitchison explains, superordination is mostly done spontaneously because items can belong to more than one category (2003:96). Thus, it is next to impossible to predict a potential superordinate which will trigger many subordinates. Therefore, the few examples of subordinations are

probably an indication of the learners' hesitation to predominantly associate in a superordinate manner.

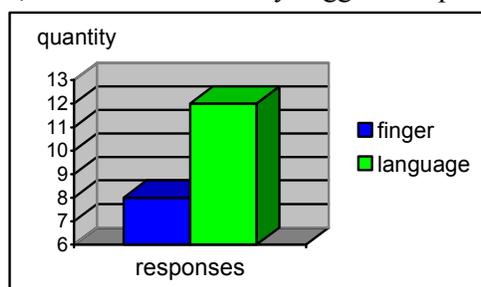
Coming to another aspect of superordination, namely meronymy, another example of subordination arises. Interestingly, the stimulus *finger* caused one participant to write a subordinate and use the stimulus as a meronym. A meronym is in meronymy the equivalent to what a superordinate is in superordination (Schmitt 2000:26). The suggestion was *nail*, which can be said to be a part of a finger. Additionally, a vague example of a subordinate relationship occurred in connection with *finger*. One participant provided *thumb* as an association to *finger*. In one dictionary the definition of *finger* is as follows: "Your **fingers** are the four long thin parts at the end of each hand" (*Collins Cobuild* 2006). The ambiguousness lies in whether the thumb counts as a finger or not: "**finger** [=] each of the four slender jointed parts to either hand (or five, if the thumb is included)" (*Oxford Dictionary of English* 2003). In the latter description of the word *finger* a choice is handed to the reader, which means that there are no strict rules concerning whether *thumb* belongs to *fingers* or not. There is actually one respondent who has associated *ten* in connection to *finger* in this test. But, that still only shows one person's opinion of the thumbs' adherence in the term *fingers*. Consequently, there is no solution to whether in this case the participant has intended the thumb to belong to the fingers or not, but it is an intriguing dilemma. If we assume that the person does not consider the thumb a finger the word association must be regarded to be coordination instead.

Continuing with meronymy, the stimulus *finger* also triggered a superordinate or specifically a meronym. Seven of the respondents, almost 27 %, answered *hand* to *finger*. The word *hand* can definitely be considered to be a uniting term for all the pieces at the end of one's arm, or in other words a part-whole relationship. The stimulus *finger* is in fact the only incentive out of the fifty which chiefly produced a superordinate/meronym. Furthermore, some researchers do not even consider meronymy to be a part of superordination (McCarthy 1990:20). If this investigation would exclude meronymy from superordination that would mean that not a single stimulus achieved mainly a superordinate. Since that is not the case, at least one stimulus showed a superordinate superiority.

Looking at the existing material the only possible hypothesis must be that the second language learners participating in this survey do not to have very strong links between a superordinate and its subordinates, or at least that the links they do have between a

superordinate and its subordinates cannot be compared with other types of connections. Therefore, superordination cannot be the most important tool for these learners to maintain their memory of English vocabulary. Ultimately, no more than two stimuli achieved predominantly associations based on superordination, see *Figure 10*. As was communicated earlier, *language* activated subordinates and *finger* mainly produced the superordinate/meronym *hand*.

Figure 10, stimuli which mainly triggered superordination



3.2.3 Synonymy

Overall, there were not very many synonyms made in this word association test. But, of course there were some made. This goes in accordance with previous word association tests which have shown that individuals do not tend to associate with synonyms very frequently (Aitchison 2003:86). Among the exceptions were three participants who associated *writer* to the stimulus *author*, two partakers responding with *unhappy* to *sad* and another two students who replied with *early* to *late*. These examples of synonymy are not the strongest ones from the test. There were other stimuli which showed a higher frequency of synonymy and they will, therefore, be further investigated now.

The verb *abandon* was included as stimulus in this word association test because the same word was presented in a test conducted with 100 British university students. Among those 100 participants exactly forty, 40 %, responded with the synonym *leave* to *abandon* (Schmitt 2000:38-9). In contrast, there were only five respondents, around 19 %, who gave the same reply in this word association test. This means that synonymy was not the most common response to *abandon*. However, three more participants gave a variation of the synonym *leave*. One person wrote *leave* in the past tense as in *left*, another replied with *left alone* and the third *left out*. These three word associations show the participants' desire to explain

abandon with some kind of description which transfers the same meaning. Yet, if these three learners had instead written the straightforward synonym of *leave*, it still would only mean that circa 31 % of the students in this test would have given a synonymous response to *abandon*. Consequently, it appears as though these second language learners are even less inclined to give synonyms in word association tests than native speakers are.

To the adverb *quickly* ten students, circa 38.5 %, responded with what has to be considered a synonym. The reason why the word *consider* is used is because obviously there is no *ly*-ending in the adverb-form of *fast*. Thus, it is assumed that the students are aware of this and have, in fact, consciously chosen to write an adverb themselves in the shape of *fast*. In Palermo and Jenkins' study approximately 42 % of the students responded with *fast* to *quickly* (1964:237-8). Consequently, that result is very similar to the outcome of this test. In addition, one person in this test wrote *rapidly* as an association to *fast*. This brings the total percentage of students writing a synonym in reply to *quickly* up to just about 42 %, which means that *quickly* primarily triggered synonyms.

Continuing on the same topic, the adjective *sleepy* was also met with predominantly synonyms. Nine of the respondents, approximately 34.5 % or more than a third, corresponded with *tired*. These results indicate that *sleepy* and *tired* are seen as highly similar by these second language learners. Still, in a dictionary the two words are explained rather differently from each other: "If you are **sleepy**, you are very tired and are almost asleep" (Collins Cobuild 2006). Compared to, "If you are **tired**, you feel that you want to rest or sleep" (Collins Cobuild 2006). In addition, in a dictionary stating synonyms *tired* is not even given as a synonym to *sleepy*. Yet, *sleepy* is given as a synonym to *tired* (Synonyms and Antonyms 2004:343&378). Thus, in the participants' mental lexicons *sleepy* and *tired* are connected firmly as having parallel meanings, while the dictionaries do not entirely agree. It is clear from the first dictionary that *sleepy* is a stronger word than *tired*, but that does not mean that they are not synonyms. Synonymy is based on similarity and if two words transfer roughly the same meaning they are to be considered synonyms (Carter 1998:20 & Schmitt 2000:1). The interesting thing about this finding is that the learners might regard and treat *sleepy* and *tired* exactly the same, which perhaps native speakers would not. It is of course not possible to find out if the learners consider the two words differently, but at least the conclusion must be that *sleepy* and *tired* have a strong synonymous bond according to the respondents. However,

there were also exactly nine collocations given to *sleepy* which means that neither synonymy nor collocation can account for activating most associations to this stimulus.

The most frequent response to the adjective *gigantic* was a synonym. The most common synonym was *huge*; this specific synonym is actually mentioned by Schmitt (2000:26). The second most frequent one is ambiguous. The question is whether the word *giant* ought to be considered a noun or an adjective. Clearly if we see it as an adjective *giant* must be considered to be a synonym to *gigantic*. But, if the participants' intentions have rather been to use the stimulus descriptively as in *a gigantic giant*, we are faced with a collocation. As it is not possible to ask the persons in question of their intent a decision has to be made. Taking into account that several other synonyms have been proposed by other participants it seems likely that *giant* is also a demonstration of a synonym. Hence, it is included among the synonyms corresponding to *gigantic* in *Figure 11*. Still, the vagueness of synonymy does not end here; some of the words which have been counted as synonyms together with *gigantic* might seem far-fetched. The word *big* might seem weak in comparison to *gigantic* and perhaps *fat* lacks total correspondence with the stimulus. But, as has been distinguished by several researchers, synonymy has to be measured at a degree of similarity (Aitchison 2003:94, Murphy 2003:137 & Schmitt 2000:1). Consequently, if the words are on the same wavelength and there is a possibility that they can transfer comparable meaning in a context they can be called synonyms. In *Figure 11* the specific synonyms given to *gigantic* can be studied. Moreover, *Figure 12* shows the superiority of synonymous word associations in the case of *gigantic*, which is nearly 54 %.

Figure 11, responses given to *gigantic*

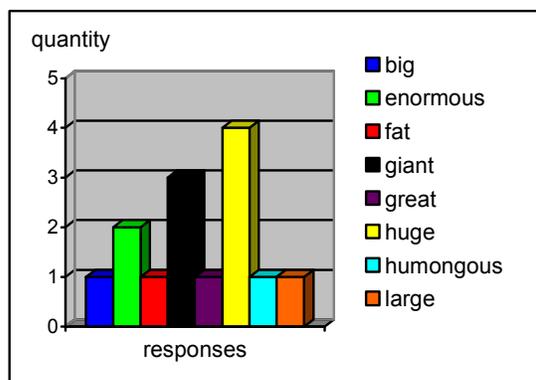
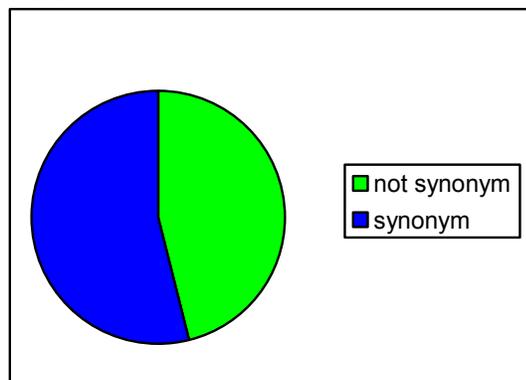
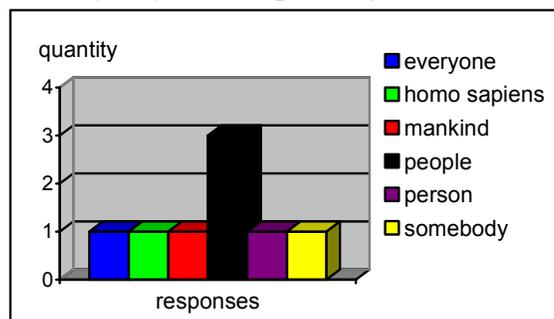


Figure 12, division of responses given to *gigantic*



The final stimulus which seems to have mainly produced synonyms is *human being*. There is a slight uncertainty as to which of the possible candidates that can actually be regarded synonyms to *human being*. The conceivable synonyms to *human being* can be seen in Figure 13.

Figure 13, synonymous responses given to *human being*

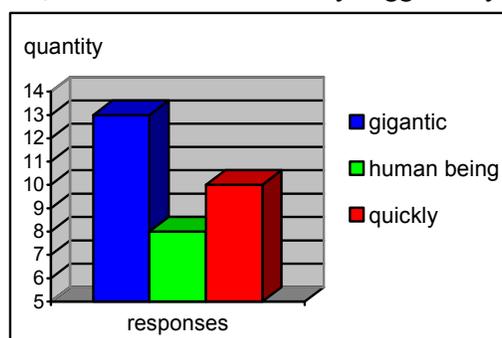


Some of the word associations seen in the figure are perhaps more understandable synonyms to *human being* than others. *Person* is for instance given as a synonym in a dictionary for synonyms to the word *human being* (*Synonyms and Antonyms* 2004:274). *People*, which is the most commonly used plural form of *person* (according to *Collins Cobuild* 2006), is stated to be a synonym to *human beings* (*Synonyms and Antonyms* 2004:272). Evidently, the participants who have responded with *people* have either missed that the stimulus was stated in singular or, possibly, they have not considered the fact that they were giving a reply in plural form. The same can be said for the person who has written *homo sapiens* in connection with *human being*. However, the term *homo sapiens* is a noun which is always in plural form (*Collins Cobuild* 2006). Therefore, the student who chose to give that answer had no other choice than to write it in the plural. With *mankind* there is a similar problem: “You can refer to all human beings as **mankind** when considering them as a group” (*Collins Cobuild* 2006). The term *mankind* is an uncountable noun, as can be observed in the quotation above, which refers to a group of human beings. Thus, *mankind* is a more accurate synonym to the plural form of *human being*. The stimuli *somebody* and *everyone* might be the vaguest candidates to pose as synonyms to *human being*. But, in a way *somebody* is a *person* and a *person* is a *human being* and therefore *somebody* is also a *human being*. Thus, *everyone* is a synonym to the plural form of *human being*. Carter emphasizes the significance of not expecting all synonyms to mean the exact same thing, but to see that their essential meaning is comparable (1998:20). Therefore, there is an awareness of the questionability to *human being*'s potential

synonyms. But, not to forget, there is a chance that the presented words can replace *human being* in a context which creates a synonymous link.

The discussion of the synonyms' extent in this word association test shows that there are not numerous synonyms given by the participants. Moreover, some of the synonyms are uncertain and vague, for instance those given to *gigantic* and particularly the ones given to *human being*. However, disregarding these ambiguities there are in total three stimuli which mainly produced synonyms, which can be seen in *Figure 14*.

Figure 14, all stimuli which mainly triggered synonymy



3.3 Clang Associations

Since the participants in this study are adults they have presumably reached a level in their first language which makes them keep their clang associations to a minimum. As Carter and Schmitt draw attention to, clang associations are mainly produced by children (Carter 1998:199 & Schmitt 2000:40). However, Meara points out that a characteristic of second language learners' language is the way they produce associations similar to that of native speaking children (1982:31). It is thus interesting to see if the respondents in this test tend to associate in their second language according to the rules of clang associations. In all, only thirteen obvious clang associations were found in this test. That constitutes precisely 1 % of the combined associations made by the twenty-six students from the fifty stimuli. Evidently, that is next to nothing and has to be considered an indication of these second language learners' weak links between words' phonological structure. Nevertheless, *weak* is a gradable word and this only means that the connections seem weak in comparison with the paradigmatic and syntagmatic links. This is definitely not a proposal to say that their second language is poorly developed, but on the contrary, it is probably well progressed.

Looking at the few clang associations which came up it can quickly be discovered that most of them are based on rhyming. The first clang association that Meara (1982:30) mentions is rhyming, whether this is an indication or not of that being the most common clang association is not stated. But, in this test it is clear that most of the produced clang associations are based on rhyming, for instance *green-screen*, *sad-bad* and *spend-depend*. All of the clang associations can be studied further in *Table 1*.

Table 1, all clang associations given in the entire test

stimulus	clang association	number of responses
butterfly	butter	1
calm	clam	1
calm	palm	2
green	screen	1
hope	rope	1
jealous	jelly	1
jump	hump	1
potatoes	toes	1
sad	bad	1
sad	mad	1
sing	swing	1
spend	depend	1

3.4 Combining the word associations

This section aims to highlight the most important findings concerning the word associations from the outcome of the conducted word association test.

The most significant discovery from the test is the strong impact which collocation has on the participants. In *Figure 15* can be seen the significant superiority of collocational associations. As was mentioned earlier, as much as 76 % of the stimuli predominantly triggered collocations. This means that coordination and synonymy only achieved 6 % each, superordination 4 % and the undetermined 8 % of the total stimuli. The stimuli which are not put under a category are *sleepy*, *joyfully*, *beautifully* and *thankfully*. The stimulus *sleepy* triggered, as has been settled earlier, just as many synonyms as collocations. Consequently, this means that neither of the categories can account for generating most associations to *sleepy*. The other three stimuli are not determined because of a completely different reason,

which will be discussed further in section 3.5.3 Adverbs. *Figure 16* shows the significance of syntagmatic associations produced in the test which, naturally, have the same great proportion of all the word associations as collocation at 76 %. By putting coordination, superordination and synonymy together the number of stimuli which mainly activated paradigmatic associations is obtained. Consequently, the figure of paradigmatic associations only comes up to 16 %.

Figure 15, division of word associations in the entire test

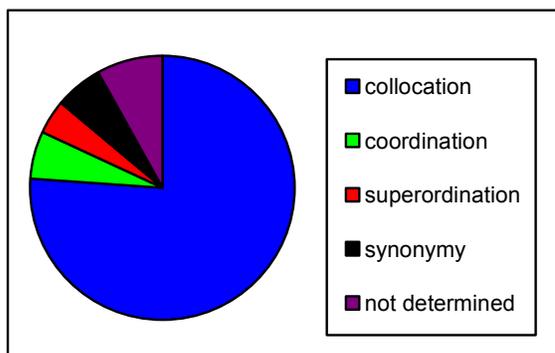
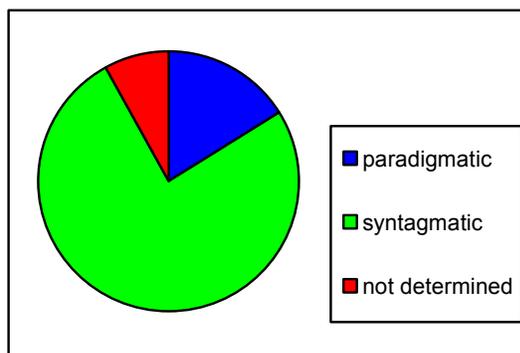


Figure 16, division of word associations in the entire test



It is obvious that the outcome of this investigation differs greatly from surveys conducted with native speakers. The most recurring word association made by native speakers is coordination (Aitchison 2003:86). In this test it is clearly collocation which is the most persistent word association. This finding is again in agreement with Söderman's discovery (1993). She found that second language learners' follow the same path, languagewise, as native speaking children. This means that they give clang associations and also go through a changeover between associating syntagmatically and later paradigmatically (Söderman (1993) in Schmitt 2000:41). Thus, the suggestion is that the second language learners in this study are past the stage of giving clang associations, but have not yet reached the level in their second language when they give predominantly paradigmatic associations. Channell (1988), referred to by McCarthy, asserts that it should not be taken for granted that the mental lexicon treats a first language and a second language the same without any substantiation to it actually being so (McCarthy 1990:34). The outcome of this investigation is a convincing indication of the variety with which our brains can deal with a second language compared to a first language. Specifically, the mental lexicon might deal with first and second languages in the same manner. But, since most people learn a second language after passing childhood, the development in the second language is far behind the progress of the first language. Thus, the

mental lexicon has to deal with the second language differently, until it is on the same level as the first language and for most people that probably never happens. Thus, it is probable that a focus on paradigmatic connections could be beneficial in vocabulary learning for these second language learners, since those links appear to be weaker in their mental lexicons.

3.5 Word Classes

This section deals with how the word associations have altered or not altered from the stimuli according to word class. There will be a look into general patterns by displaying examples of common kinds of word class constellations. Word associations and stimuli which belong to more than one word class will be excluded from the calculations. Since some words belong to more than one word class it is more practical to show the essential findings than going into detail. Therefore, the concluding result given to each word class is calculated after which word class that was mainly given to each stimulus within the specific word classes. Thus, not all of the word associations' word classes are included in those calculations. It should, instead, be considered an estimation based on which word class that has been most frequent to each stimulus.

3.5.1 Nouns

Nouns were the largest group in the word association test when it comes to the stimuli's word classes. This was a conscious decision based on nouns' dominance in languages at large. Totally there were twenty-eight stimuli which can be referred to as nouns. However, as was just mentioned, since some stimuli belong to more than one word class they will have to be excluded from the discussion of word classes. The stimuli which cannot belong to another word class than nouns are in total twenty-one. Amazingly, all of the nouns actually triggered mainly other nouns. All of the twenty-one nouns are presented in *Table 2*. The table shows the quantity of nouns given to each of the noun stimuli. Furthermore, the percentage is also shown to add extra clarity. As can be seen in the table, *swimwear* received the highest quantity of noun replies. These results show that 100 % of the noun stimuli mainly activated nouns. This could be an indication of these stimuli's activation of paradigmatic associations (coordination, superordination and synonymy), since syntagmatic associations (collocation) primarily consist of two words with differing word class (Schmitt 2000:39). But, in this test

there have been a great amount of syntagmatic associations with the same word class. For instance *queen-crown*, *author-books* and *table-dinner* are all syntagmatic relationships even though all of the components belong to nouns. Consequently, although the nouns have produced words from their own word class it is not assumed that most of the created word associations are based on paradigmatic relationships. However, word associations which consist of two nouns, of course, create a possibility of having a paradigmatic association.

Table 2, quantity of nouns given to noun stimuli

noun	noun given as word association	%
swimwear	24	92
queen	23	88.5
author	21	81
Christmas	20	77
finger	20	77
salt	20	77
chef	19	73
table	19	73
accident	18	69
cameras	18	69

cat	18	69
language	17	65.5
evening	16	61.5
potatoes	16	61.5
brother	14	54
human being	14	54
policeman	14	54
apple	13	50
butterfly	13	50
elevator	13	50
university	13	50

3.5.2 Adjectives

In total there were thirteen stimuli which can belong to adjectives: *hungry*, *red*, *calm*, *claustrophobic*, *comfortable*, *sleepy*, *green*, *small*, *jealous*, *sad*, *late*, *gigantic* and *independent*. However, three of the adjectives can belong to other word classes as well depending on what context they are in. For instance, *red* can be a noun in certain circumstances, such as a red wine can be called *a red* (Collins Cobuild 2006). But, because such an interpretation, of the otherwise so commonly accepted adjective *red*, is not very probable the stimulus *red* will still count as an adjective in this test. The stimulus *calm* can be an adjective, noun and a verb depending on the situation. *Calm* is used to describe people when it is an adjective. As a noun *calm* describes a feeling or sense of something. Lastly it can be used as verb when someone *calms* someone else (Collins Cobuild 2006). Since *calm* is commonly used by all of the three presented word classes, the word will be excluded from the discussion of word associations given to verbs in this test. The verb *late* can be used as both an adverb and an adjective. When it is an adverb it concerns the lateness of time, as in *she was*

late. As an adjective it is naturally used to describe lateness of nouns, as in *it is now late spring* (Collins Cobuild 2006). It seems as though *late* is frequently used as both an adverb and a noun, thus, it is not included in this section concerning what word classes adjectives have produced.

To most of the adjectives mainly nouns were given as word associations. In fact, there was only one adjective which did not generate primarily nouns. The stimulus *gigantic* activated fourteen other adjectives, which is slightly less than 54 %. One of the word associations to *gigantic* was *giant* which can obviously both be an adjective as well as a noun. Since *giant* was accepted as a synonym to *gigantic* in section 3.2.3 Synonymy, it is also counted here as an adjective. As has been introduced before, *gigantic* was met by many synonyms. The reason for this is of course that synonymy requires the same word class between the items.

The rest of the adjectives, thus, mainly triggered nouns. The adjective *hungry* actually activated as many as twenty-two noun responses, which is close to 85 % of its replies. The adjectives *comfortable* and *green* both triggered nineteen nouns each which is 73 % of their responses. Further, *red* received fifteen nouns (nearly 58 %), *small* activated thirteen nouns (50 %), *claustrophobic*, *jealous* and *sad* triggered twelve nouns each (around 46 %) and finally *sleepy* and *independent* produced ten nouns each (circa 38.5 %). These figures show the respondents' tendency to associate with a noun to an adjective. Moreover, the strong advantage of nouns given to adjectives suggests that the participants mainly make syntagmatic associations when faced with an adjective. As Schmitt points out, most syntagmatic associations are based on two words with differing word classes (2000:39).

In *Figure 17* can be seen the division of the word classes given to the adjectives in the test.

Figure 17, division of word classes given to adjectives



The figure clearly illustrates the participants' inclination to respond with a noun to an adjective. Crystal points out that a paradigmatic relationship entails the possibility to exchange words in a context with not present words (1985:162). Consequently, to be able to replace a word in a context with another word a demand is, obviously, that the replacement has the same word class as the word that is being substituted. Since the participants have not given many associations with the same word class as the stimuli this must mean that there cannot be many paradigmatic associations based on adjectives.

3.5.3 Adverbs

When investigating the results from the stimuli which belong to adverbs it is plain to see that there is not really a preferred word class which the participants have associated with. In total there were five adverbs given as stimuli: *joyfully*, *beautifully*, *thankfully*, *quickly* and *late*. However, as was discussed in section 3.5.2 Adjectives, *late* can belong to both adverbs and adjectives and therefore that word is not included in this section either.

To *joyfully* eleven students replied *happy*, one *glad* and one student *nice* which in total means that 50 % answered with an adjective. This was the largest agreeing word class given to *joyfully*. It seems as though these participants might have intended to create a synonym to *joyfully* but failed to do so. This is of course only a speculation, but otherwise they have produced word associations which can neither be put under syntagmatic nor paradigmatic connections. It has been established that it is not uncommon for second language learners to misinterpret stimuli and consequently, give odd associations (Meara 1982:31 & Schmitt 2000:41). In this situation this could mean that the students have recognized the word *joyfully* but have not been able to correctly conclude in what kind of grammatical context one might use it. Thus, they have used the knowledge of the stimulus which they actually possess which is the meaning of *joyful* and produced a synonym in accordance with that meaning. However, since this possible synonym is highly uncertain it is not counted as a synonym in the results of the word association test.

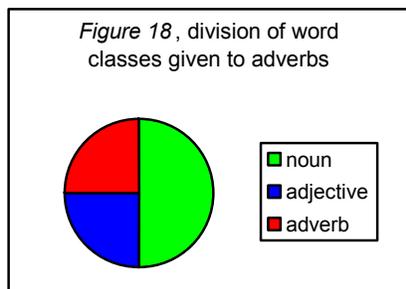
Two of the adverbs, *beautifully* and *thankfully*, activated mostly different kinds of nouns from the respondents. The total number of nouns given to *beautifully* is eighteen and in per cent that is roughly 69 %. To *thankfully* the superiority of nouns is not as large, thirteen

participants or 50 % replied with a noun. In accordance with the replies to *joyfully* it appears as if the respondents have misinterpreted these two stimuli as well. The students might not be sure of adverbs' grammatical behaviour. Adverbs possess, as might be known, the power to describe verbs. They do not, however, have the ability like adjectives to describe nouns. But, there are more nouns than verbs given as word associations to *beautifully* and *thankfully*. For instance, four partakers have replied with *butterfly* to *beautifully*. It is grammatically impossible to use the adverb *beautifully* to describe the noun *butterfly*, as in *a beautifully butterfly*. On the other hand, it is both semantically and grammatically acceptable to use the adjective *beautiful* to describe the noun *butterfly*, as in *a beautiful butterfly*. Therefore, the conclusion which is drawn is that the participants have mistaken the adverbs *beautifully* and *thankfully* for adjectives and responded accordingly. They have, just like with *joyfully*, most likely applied what they do know about the stimuli and consciously or unconsciously ignored the grammatical form of adverbs.

As has been mentioned before, the stimulus *quickly* was met with mostly synonyms, *fast* being the most frequent one. It was earlier concluded that the respondents were aware of producing a synonym, which subsequently means that *fast* can be assumed to here be an *adverb*. Thus, the adverb *quickly* triggered ten adverbs, which is 38.5 %. Moreover, *quickly* is the only adverb in this test where the participants do not appear to have misunderstood the grammatical form. There can be various reasons to why *quickly* is interpreted correctly and the other adverbs are not, especially two factors seem to be involved. Firstly, it is obvious that *quickly* has a different form than the other adverbs in this test because it does not end in *-fully*. Secondly, *quickly* generated many agreeing responses (*fast*), which is, according to Chaffin (1997), an indication of a word's familiarity and well-established organization in the mental lexicon (Marschark *et al.* 2004:53). Yet, *joyfully* also triggered a large amount of concurrent responses. This, however, is probably due to the noun *joy's* well-organized network.

Figure 18 shows the division of the different word classes given to adverbs. Although there were only four clear-cut adverbs included in the test, the results give an indication of how the participants are likely to choose a dissimilar word class to an adverb. In other words, the students tended to not respond with an adverb to an adverb, which, consequently, means that they were not inclined to give paradigmatic associations to the adverbs.

Figure 18, division of word classes given to adverbs



3.5.4 Verbs

In this test there were a total of twelve verbs, however six of those verbs can also be interpreted as nouns. Those six stimuli are *circle*, *fish*, *drive*, *calm*, *snow* and *hope*. Since it is impossible to predict which word class they have been understood as by the respondents, they will not be included in the discussion of associations given to verbs. Thus, word associations given to six verbs are looked at in this section. Those six verbs/stimuli are: *abandon*, *jump*, *succeed*, *eat*, *spend* and *sing*. The general pattern concerning the stimuli which belong to verbs is that they have predominantly triggered nouns from the participants.

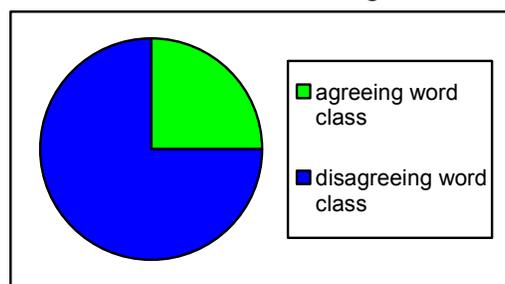
Both *eat* and *spend* produced twenty nouns each, which is close to 77 % of all the responses given to those verbs. Moreover, as has been mentioned earlier, one word in particular to each of these stimuli (*eat* and *spend*) was produced by the participants. Most respondents gave *food* to *eat* and *money* to *spend*.

To the other verbs the superiority of word associations based on nouns was not as huge. *Abandon* produced fourteen nouns, nearly 54 %, *succeed* activated twelve nouns, around 46 %, *sing* also triggered twelve nouns and finally *jump* generated ten nouns, roughly 38 %. On the whole, this means that all of the verbs mainly triggered nouns. Therefore, the verbs, just like the adjectives and adverbs, did not create many paradigmatic associations.

3.5.5 Combining the word classes

This section aims to show the general patterns concerning all of the word classes. In *Figure 19* is illustrated the combined results of how the stimuli generated the same word class or not.

Figure 19, division of word classes given to all stimuli



For the most part, all of the word classes mainly produced nouns in this test. As was mentioned in 3.5.1 Nouns, the majority of the stimuli in this test belong to nouns because it is the largest word class. Thus, the abundance of nouns in languages can be an explanation to why most of the responses in this test are nouns.

One early finding within word associations is that adults tend to reply with the same word class as the stimulus (Aitchison 2003:85). Furthermore, this means that adults primarily respond with paradigmatic associations (Murphy 2003:40). All of the word classes mainly produced nouns. Consequently, adjectives, adverbs and verbs mostly showed signs of having syntagmatic relationships, while, the nouns had the opportunity to generate both paradigmatic and syntagmatic associations. In addition, the figure shows that the respondents in this test produced a dissimilar word class to 75 % of the stimuli. This means that only 25 % of the stimuli can have activated paradigmatic associations; since a paradigmatic association always has the same word class as the stimulus (Schmitt 2000:39). As has been noted before, native speaking adults usually reply in word association tests with mostly paradigmatic associations (Schmitt 2000:40). Clearly, there is a great difference between these second language learners' answers and native speakers' responses regarding word class.

Thus, the results from looking at the word classes and types of associations agree. Mostly, the respondents have given syntagmatic associations with a few rare paradigmatic ones. Or in other words, the results from the test show that the respondents have mainly created collocations with disagreeing word classes. Thus, there are significantly fewer associations made based on coordination, superordination and synonymy.

4. Conclusion

This essay has looked into how our minds deal with vocabulary and especially how a second language seems to be built up. The goal of this investigation has been to explore second language learners' word association patterns. This information was gathered from a word association test conducted with twenty-six second language learners. Additionally, a comparison of these results has been done with previous results from word association tests with first language speakers.

The outcome of the word association test has shown that the second language learners, participating in this investigation, tend to give collocational associations. This means that they mostly gave syntagmatic associations. Thus, only occasional cases of coordination, superordination and synonymy made an appearance in the results. Furthermore, the learners tended to reply with different word classes than the incentive words. The participants' word associations contrast greatly with native speaking adults' way of connecting words in tests. First language users mainly give the same word class as the stimulus, which means that they answer paradigmatically, unlike the respondents in this test. However, the outcome of this test indicates that second language learners go through the same language development as native speakers. Consequently, this means that the partakers in this test give associations similar to native speaking children and as their second language progresses they will presumably start associating more paradigmatically. A focus on paradigmatic associations in learning environments might quicken this development. This is, however, only a speculation; hopefully, future investigations will explore this theory further

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Appendix A

This test must be done individually; otherwise the results will not be reliable. The task in this exercise is to write the first English word which you think about after each given word. In other words do not consider what you write down, but write the very first word which comes to you. Please do not give translations in your mother tongue. If you are not familiar with a word just skip it and move on to the next word. It does not matter if you misspell a word, so please do not hesitate to write a word because you are uncertain of its spelling.

- | | |
|--------------------------|-----------------------|
| 1. abandon _____ | 26. jealous _____ |
| 2. butterfly _____ | 27. university _____ |
| 3. hungry _____ | 28. succeed _____ |
| 4. red _____ | 29. apple _____ |
| 5. salt _____ | 30. thankfully _____ |
| 6. queen _____ | 31. evening _____ |
| 7. beautifully _____ | 32. light _____ |
| 8. circle _____ | 33. accident _____ |
| 9. hope _____ | 34. eat _____ |
| 10. cameras _____ | 35. potatoes _____ |
| 11. calm _____ | 36. sad _____ |
| 12. cat _____ | 37. late _____ |
| 13. snow _____ | 38. gigantic _____ |
| 14. drive _____ | 39. table _____ |
| 15. swimwear _____ | 40. human being _____ |
| 16. chef _____ | 41. spend _____ |
| 17. claustrophobic _____ | 42. author _____ |
| 18. comfortable _____ | 43. Christmas _____ |
| 19. sleepy _____ | 44. brother _____ |
| 20. joyfully _____ | 45. sing _____ |
| 21. jump _____ | 46. language _____ |
| 22. green _____ | 47. independent _____ |
| 23. finger _____ | 48. elevator _____ |
| 24. small _____ | 49. quickly _____ |
| 25. policeman _____ | 50. fish _____ |

Thank you very much for taking time to participate in this study!

Appendix B collo. (collocation), coor. (coordination),
super. (superordination), syno. (synonymy) and n.i. (not identified)

<i>1. abandon</i>		
leave	5	syno.
child	3	collo.
dog	2	collo.
alone	1	collo.
buss	1	n.i.
children	1	collo.
give away	1	n.i.
gone	1	n.i.
hair	1	n.i.
kids	1	collo.
left	1	n.i.
left alone	1	n.i.
left out	1	n.i.
milk	1	n.i.
me	1	n.i.
refuge	1	collo.
ship	1	collo.
no answer	2	n.i.
<i>2. butterfly</i>		
beautiful	4	collo.
colour	2	collo.
colours	2	collo.
flowers	2	collo.
free	2	collo.
animal	1	super.
blue	1	collo.
butter	1	clang
flight	1	collo.
flower	1	collo.
grass	1	collo.
happiness	1	collo.
insect	1	super.
pink	1	collo.
purple	1	collo.
summer	1	collo.
wings	1	collo.
yellow	1	collo.
no answer	1	n.i.
<i>3. hungry</i>		
food	11	collo.
starving	3	syno.
hamburger	2	collo.
dessert	1	collo.
eat	1	collo.
kebab	1	collo.
kids	1	n.i.
mouse	1	n.i.
pancakes	1	collo.

poor	1	collo.
sandwich	1	collo.
street-children	1	collo.
toast	1	collo.
<i>4. red</i>		
blood	6	collo.
blue	4	coor.
colour	2	super.
love	2	collo.
rose	2	collo.
balloons	1	collo.
bull	1	collo.
fire	1	collo.
heat	1	collo.
Indians	1	collo.
Santa	1	collo.
splatter	1	collo.
stop	1	collo.
strawberries	1	collo.
wall	1	n.i.
<i>5. salt</i>		
pepper	8	coor.
ocean	3	collo.
fish	2	collo.
food	2	collo.
sugar	2	coor.
candy	1	collo.
Ghandi	1	n.i.
sea	1	collo.
sour	1	n.i.
spice	1	n.i.
tasty	1	collo.
water	1	collo.
white	1	collo.
no answer	1	n.i.
<i>6. queen</i>		
king	7	coor.
crown	6	collo.
England	4	collo.
band	1	collo.
Bohemian Rhapsody	1	collo.
country	1	collo.
Elizabeth	1	collo.
Freddie	1	collo.
royal	1	collo.
rule	1	collo.

Appendix B collo. (collocation), coor. (coordination),
super. (superordination), syno. (synonymy) and n.i. (not identified)

<i>6. queen continued</i>		
Silvia	1	collo.
strong	1	collo.
<i>7. beautifully</i>		
butterfly	4	n.i.
flower	2	n.i.
air	1	n.i.
amazingly	1	coor.
blonde	1	n.i.
charming	1	n.i.
diamond	1	n.i.
dress	1	n.i.
girl	1	n.i.
hair	1	n.i.
horse	1	n.i.
model	1	n.i.
myself	1	n.i.
neat	1	n.i.
princess	1	n.i.
smile	1	collo.
sun	1	n.i.
television	1	n.i.
ugly	1	n.i.
women	1	n.i.
no answer	2	n.i.
<i>8. circle</i>		
round	6	collo.
ball	5	collo.
square	3	coor.
aerobic	1	collo.
clock	1	collo.
exhausting	1	n.i.
football	1	collo.
graffiti	1	n.i.
maths	1	collo.
money	1	n.i.
lion	1	n.i.
Stonehenge	1	collo.
sun	1	collo.
together	1	collo.
water	1	collo.
<i>9. hope</i>		
faith	4	coor.
joy	2	coor.
freedom	2	coor.
trust	2	coor.
Arnold Schwarzenegger	1	n.i.

chain	1	collo.
dream	1	coor.
glory	1	coor.
jump	1	n.i.
less	1	collo.
light	1	n.i.
love	1	coor.
movies	1	n.i.
necklace	1	collo.
peace	1	coor.
rope	1	clang
sky	1	n.i.
song	1	collo.
yes	1	n.i.
no answer	1	n.i.
<i>10. cameras</i>		
photos	5	collo.
photo	4	collo.
flash	2	collo.
pictures	2	collo.
city life	1	n.i.
diving	1	n.i.
everywhere	1	n.i.
family	1	n.i.
lens	1	collo.
models	1	collo.
silence	1	n.i.
sun	1	n.i.
tv-show	1	collo.
no answer	4	n.i.
<i>11. calm</i>		
easy	2	collo.
palm	2	clang
angry	1	coor.
breath	1	n.i.
clam	1	clang
cold	1	n.i.
happy	1	n.i.
hard	1	n.i.
hurry	1	n.i.
ice	1	n.i.
love	1	n.i.
meditation	1	collo.
mum	1	n.i.
ocean	1	collo.
peace	1	collo.
quiet	1	collo.
relax	1	collo.

Appendix B collo. (collocation), coor. (coordination),
super. (superordination), syno. (synonymy) and n.i. (not identified)

<i>11. calm continued</i>		
sensitive	1	n.i.
sleep	1	collo.
soon	1	n.i.
stress	1	n.i.
submissive	1	n.i.
surrender	1	n.i.
wind	1	collo.
<i>12. cat</i>		
dog	14	coor.
black	3	collo.
friend	2	collo.
black and white	1	collo.
disgusting	1	n.i.
fish	1	collo. or coor.
tail	1	collo.
Whiskas	1	collo.
no answer	2	n.i.
<i>13. snow</i>		
white	10	collo.
cold	5	collo.
snow flake	2	collo.
flakes	1	collo.
fun	1	n.i.
hey	1	n.i.
snowboard	1	collo.
snowman	1	collo.
Snow White	1	collo.
winter	1	super.
yellow	1	n.i.
no answer	1	n.i.
<i>14. drive</i>		
car	15	collo.
fast	2	collo.
car accident	1	collo.
drunk	1	n.i.
handbrake	1	collo.
out	1	n.i.
run	1	coor.
speed	1	collo.
wheel	1	collo.
wheels	1	collo.
no answer	1	n.i.
<i>15. swimwear</i>		
bikini	5	super.
pool	3	collo.
summer	3	collo.

water	3	collo.
bathing-suit	2	super.
adidas	1	collo.
beach	1	collo.
body	1	collo.
colours	1	collo.
dots	1	collo.
goggles	1	super.
swimming pool	1	collo.
swimmer	1	collo.
no answer	2	n.i.
<i>16. chef</i>		
boss	4	coor.
food	4	collo.
restaurant	3	collo.
job	2	super.
Southpark	2	collo.
cook	1	coor. or collo.
flavours	1	collo.
frying pan	1	collo.
Gordon	1	collo.
Hell's Kitchen	1	collo.
idiot	1	n.i.
knife	1	collo.
onion	1	collo.
person	1	n.i.
no answer	2	n.i.
<i>17. claustrophobic</i>		
elevator	4	collo.
box	2	collo.
closet	2	collo.
panic	2	collo.
black	1	collo.
cage	1	collo.
grave	1	collo.
help	1	n.i.
prison	1	collo.
scared	1	collo.
terrible	1	n.i.
trapped	1	collo.
wardrobe	1	collo.
no answer	7	n.i.
<i>18. comfortable</i>		
couch	4	collo.
sofa	4	collo.
bed	3	collo.
chair	3	collo.

Appendix B collo. (collocation), coor. (coordination),
super. (superordination), syno. (synonymy) and n.i. (not identified)

<i>18. comfortable continued</i>		
pillow	3	collo.
nice	2	coor.
cold	1	coor.
cosy	1	syno.
lazy	1	coor.
pyjamas	1	collo.
sleep	1	collo.
wheel-chair	1	collo.
no answer	1	n.i.
<i>19. sleepy</i>		
tired	9	syno.
bed	3	collo.
pillow	3	collo.
always	1	n.i.
dreams	1	collo.
gasp	1	n.i.
headache	1	n.i.
insomnia	1	collo.
me	1	n.i.
nauseous	1	coor.
nice	1	n.i.
Sleeping Beauty	1	collo.
no answer	2	n.i.
<i>20. joyfully</i>		
happy	11	n.i.
smile	2	collo.
angels	1	n.i.
children	1	n.i.
Ferris Wheel	1	n.i.
flower	1	n.i.
glad	1	n.i.
happiness	1	n.i.
joystick	1	clang
laughter	1	n.i.
nice	1	n.i.
Santa	1	n.i.
smiling	1	collo.
no answer	2	n.i.
<i>21. jump</i>		
up	4	collo.
high	3	collo.
bridge	2	collo.
happy	2	n.i.
work-out	2	collo.
bicycle	1	n.i.
bouncing	1	n.i.
boxers	1	n.i.

bungee	1	collo.
bungee-jump	1	collo.
fall	1	coor.
Florida	1	n.i.
hump	1	clang
run	1	coor.
shoes	1	n.i.
summer-breeze	1	n.i.
trampoline	1	collo.
no answer	1	n.i.
<i>22. green</i>		
grass	10	collo.
blue	2	coor.
forest	2	collo.
tree	2	collo.
eyes	1	collo.
flower	1	collo.
go	1	collo.
golf	1	collo.
military	1	collo.
moss	1	collo.
screen	1	clang
soccer-field	1	collo.
summer	1	collo.
weed	1	collo.
<i>23. finger</i>		
hand	7	super.
ring	5	collo.
foot	2	collo.
nail	1	super.
nail polish	1	collo.
ouch	1	n.i.
pain	1	n.i.
pen	1	collo.
red	1	n.i.
tan	1	n.i.
ten	1	collo.
thumb	1	super. or coor.
toe	1	coor.
toes	1	n.i.
no answer	1	n.i.
<i>24. small</i>		
big	4	coor.
baby	2	collo.
dwarf	2	collo.
children	2	collo.
fat	2	coor.

Appendix B collo. (collocation), coor. (coordination),
super. (superordination), syno. (synonymy) and n.i. (not identified)

<i>24. small continued</i>		
penis	2	n.i.
anorexia	1	collo.
box	1	n.i.
dog	1	collo.
good	1	n.i.
large	1	coor.
leprechaun	1	collo.
little	1	syno.
not	1	n.i.
rabbit	1	collo.
short	1	syno.
thin	1	syno.
tiny	1	syno.
<i>25. policeman</i>		
blue	5	collo.
jerk	2	n.i.
authority	1	syno. or collo.
baton	1	collo.
cop	1	syno.
gun	1	collo.
fireman	1	coor.
hats	1	collo.
helpful	1	collo.
important	1	collo.
law	1	collo.
me	1	n.i.
officer	1	syno.
pose	1	n.i.
safe	1	n.i.
she	1	n.i.
soccer game	1	n.i.
Spiderman	1	n.i.
trunk	1	n.i.
Village People	1	collo.
no answer	1	n.i.
<i>26. jealous</i>		
black	4	collo.
green	3	collo.
girls	2	collo.
guy	2	collo.
boyfriend	1	collo.
couple	1	collo.
envious	1	syno.
envy	1	n.i.
girlfriend	1	collo.
guys	1	collo.

humiliated	1	coor.
immature	1	coor.
jelly	1	clang.
love affair	1	collo.
me	1	n.i.
relationships	1	collo.
scream	1	n.i.
sometimes	1	n.i.
no answer	1	n.i.
<i>27. university</i>		
study	5	collo.
studies	3	collo.
hard	2	n.i.
school	2	coor. or super. or syno.
books	1	collo.
breathe	1	n.i.
college	1	coor. or syno.
dorm	1	collo.
education	1	collo.
future	1	collo.
happy	1	n.i.
high school	1	coor.
manor	1	coor.
painful	1	n.i.
smart	1	n.i.
students	1	collo.
no answer	2	n.i.
<i>28. succeed</i>		
happy	6	n.i.
goal	2	collo.
accomplish	1	syno.
failure	1	n.i.
goals	1	collo.
good	1	n.i.
graduation	1	collo.
money	1	collo.
nothing	1	n.i.
police	1	n.i.
smile	1	n.i.
star	1	collo.
success	1	collo.
translate	1	n.i.
will	1	collo.
win	1	syno.
no answer	4	n.i.

Appendix B collo. (collocation), coor. (coordination),
super. (superordination), syno. (synonymy) and n.i. (not identified)

<i>29. apple</i>		
green	7	collo.
tree	4	collo.
pear	3	coor.
fruit	2	super.
banana	1	coor.
bowl	1	collo.
computer	1	collo.
crunchy	1	collo.
eat	1	collo.
fresh	1	collo.
head	1	n.i.
orange	1	coor.
red	1	collo.
salt	1	n.i.
<i>30. thankfully</i>		
Thanksgiving	3	collo.
Christmas	2	collo.
God	2	collo.
grateful	2	n.i.
turkey	2	collo.
cake	1	n.i.
cheerful	1	n.i.
family	1	collo.
give	1	collo.
great	1	n.i.
happy	1	n.i.
ironic	1	n.i.
kind	1	n.i.
living	1	collo.
mom	1	collo.
open	1	n.i.
satisfied	1	collo.
yes	1	n.i.
no answer	2	n.i.
<i>31. evening</i>		
night	3	coor. or syno
dark	2	collo.
dress	2	collo.
morning	2	coor.
party	2	collo.
beer	1	collo.
calming	1	collo.
cosy	1	collo.
darkness	1	collo.
event	1	collo.
food	1	collo.

home	1	collo.
late	1	collo.
moon	1	collo.
sleep	1	collo.
sleepy	1	collo.
star	1	collo.
stars	1	collo.
sunset	1	collo.
no answer	1	n.i.
<i>32. light</i>		
lamp	3	collo. or syno.
dark	3	coor.
cola	2	collo.
sun	2	collo.
bright	1	syno.
candles	1	collo.
darkness	1	coor.
dawn	1	collo.
disgusting	1	n.i.
flash	1	collo.
globe	1	n.i.
morning	1	collo.
party	1	n.i.
shine	1	collo.
somewhere	1	n.i.
star	1	collo.
street lights	1	collo.
yellow	1	collo.
no answer	2	n.i.
<i>33. accident</i>		
car	7	collo.
car accident	3	collo.
car crash	3	collo.
happens	2	collo.
blood	1	collo.
death	1	collo.
friend	1	n.i.
funny	1	n.i.
misery	1	collo.
ops	1	n.i.
sadness	1	collo.
toy	1	n.i.
unfortunate	1	collo.
no answer	2	n.i.
<i>34. eat</i>		
food	8	collo.
hungry	2	collo.

Appendix B collo. (collocation), coor. (coordination),
super. (superordination), syno. (synonymy) and n.i. (not identified)

<i>34. eat continued</i>		
mouse	2	n.i.
breakfast	1	collo.
candy	1	collo.
cat	1	n.i.
cookie	1	collo.
cookies	1	collo.
hamburger	1	collo.
have to	1	collo.
me	1	n.i.
meat	1	collo.
potatoes	1	collo.
salad	1	collo.
starving	1	collo.
tasty	1	collo.
no answer	1	n.i.
<i>35. potatoes</i>		
chips	2	collo. or super.
earth	2	collo.
mashed	2	collo.
round	2	collo.
school	2	n.i.
brown	1	collo.
custard	1	n.i.
eat	1	collo.
food	1	super.
french fries	1	collo. or super.
fries	1	collo. or super.
good	1	n.i.
gravy	1	collo.
McDonalds	1	collo.
meat	1	collo.
potato	1	n.i.
toes	1	clang
tomatoes	1	collo.
yellow	1	collo.
no answer	2	n.i.
<i>36. sad</i>		
tears	7	collo.
cry	5	collo.
girl	2	collo.
happy	2	coor.
unhappy	2	syno.
bad	1	clang
grin	1	n.i.
heart	1	collo.

hurt	1	collo.
mad	1	clang
man	1	n.i.
panda	1	n.i.
terrible	1	collo.
<i>37. late</i>		
night	3	collo.
dark	2	collo.
early	2	coor.
school	2	collo.
annoyed	1	collo.
boy	1	n.i.
city	1	collo.
clock	1	collo.
dinner	1	collo.
headache	1	n.i.
hurry	1	collo.
hurrying	1	collo.
The Tonight show with Conan O'Brian	1	collo.
mistake	1	collo.
morning	1	collo.
mornings	1	collo.
myself	1	n.i.
shoes	1	n.i.
sleep	1	collo.
work	1	collo.
no answer	1	n.i.
<i>38. gigantic</i>		
huge	4	syno.
giant	3	syno.
enormous	2	syno.
big	1	syno.
elephant	1	collo.
fat	1	syno.
funny	1	n.i.
great	1	syno.
house	1	collo.
humongous	1	syno.
King Kong	1	collo.
large	1	syno.
nose	1	n.i.
overwhelming	1	coor.
penis	1	n.i.
ship	1	n.i.
world	1	collo.
no answer	3	n.i.

Appendix B collo. (collocation), coor. (coordination),
super. (superordination), syno. (synonymy) and n.i. (not identified)

<i>39. table</i>		
dinner	4	collo.
chair	3	coor.
kitchen	2	collo.
wood	2	collo.
big	1	collo.
closet	1	coor.
cool	1	n.i.
flower	1	n.i.
food	1	collo.
fork	1	collo.
living room	1	collo.
pill	1	n.i.
spoon	1	collo.
tennis	1	collo.
together	1	n.i.
ugly	1	n.i.
no answer	3	n.i.
<i>40. human being</i>		
people	3	syno.
body	2	collo.
monkey	2	coor.
alien	1	coor.
animal	1	coor.
everyone	1	syno.
face	1	n.i.
friend	1	n.i.
homo sapiens	1	syno.
humanity	1	syno. or collo.
life	1	collo.
mankind	1	syno.
many	1	n.i.
person	1	syno.
reasonable	1	collo.
selfish	1	collo.
somebody	1	syno.
us	1	n.i.
vulnerable	1	collo.
no answer	3	n.i.
<i>41. spend</i>		
money	14	collo.
clothes	4	collo.
buy	2	syno.
depend	1	clang
dress	1	n.i.
please	1	n.i.
use	1	n.i.

no answer	2	n.i.
<i>42. author</i>		
book	9	collo.
writer	3	syno.
books	2	collo.
Astrid Lindgren	1	collo.
boring	1	n.i.
feather pen	1	collo.
hour	1	n.i.
maker	1	syno.
me	1	n.i.
movie	1	n.i.
tv	1	n.i.
Romeo and Juliet	1	collo.
no answer	3	n.i.
<i>43. Christmas</i>		
presents	4	collo.
Santa Claus	4	collo.
tree	4	collo.
red	3	collo.
family	2	collo.
Santa	2	collo.
alcohol	1	collo.
fun	1	collo.
gifts	1	collo.
green	1	collo.
memory	1	collo.
morning	1	collo.
snow	1	collo.
<i>44. brother</i>		
sister	9	coor.
big brother	1	collo.
bother	1	n.i.
church	1	collo.
family	1	super.
liquid	1	n.i.
loyal	1	collo.
mother	1	coor.
ok	1	n.i.
punishments	1	n.i.
stupid	1	n.i.
tall	1	n.i.
no answer	6	n.i.
<i>45. sing</i>		
laugh	2	coor.
loud	2	collo.
music	2	collo.
song	2	collo.

Appendix B collo. (collocation), coor. (coordination),
super. (superordination), syno. (synonymy) and n.i. (not identified)

<i>45. sing continued</i>		
along	1	collo.
bad	1	collo.
Britney Spears	1	collo.
fun	1	collo.
happiness	1	collo.
happy	1	collo.
karaoke	1	collo.
message	1	n.i.
microphone	1	collo.
no	1	n.i.
note	1	collo.
swing	1	clang
voice	1	collo.
warm	1	n.i.
yes	1	n.i.
no answer	3	n.i.
<i>46. language</i>		
Swedish	6	super.
Spanish	3	super.
speak	2	collo.
talk	2	collo.
China	1	collo.
communication	1	collo.
countries	1	collo.
different	1	collo.
easy	1	n.i.
English	1	super.
German	1	super.
grudge	1	n.i.
hard	1	n.i.
Italian	1	super.
many	1	n.i.
the world	1	collo.
no answer	1	n.i.
<i>47. independent</i>		
woman	4	collo.
women	2	collo.
bed	1	n.i.
believe	1	n.i.
cool	1	n.i.
free	1	syno.
freedom	1	collo.
good	1	n.i.
hard	1	n.i.
Independence Day	1	n.i.
lonely	1	coor.

one	1	n.i.
righteous	1	coor.
self-esteem	1	collo.
self-confident	1	coor.
soul	1	n.i.
stand	1	n.i.
no answer	5	n.i.
<i>48. elevator</i>		
scary	4	collo.
electricity	2	collo.
up	2	collo.
accident	1	n.i.
button	1	collo.
buttons	1	collo.
claustrophobic	1	collo.
cubical	1	collo.
fear	1	collo.
Florida	1	n.i.
lights	1	n.i.
no	1	n.i.
room	1	collo. or coor.
scale	1	collo.
scared	1	collo.
shaft	1	collo.
small	1	collo.
song	1	collo.
stuck	1	collo.
warm	1	collo.
no answer	1	n.i.
<i>49. quickly</i>		
fast	9	syno.
run	3	collo.
now	2	n.i.
bunny	1	n.i.
everything	1	n.i.
hurry	1	collo.
rapidly	1	syno.
rush	1	collo.
sex	1	n.i.
speed	1	collo.
stressed	1	n.i.
stressful	1	n.i.
sweaty	1	n.i.
no answer	2	n.i.
<i>50. fish</i>		
water	7	collo.
bad	1	n.i.

Appendix B collo. (collocation), coor. (coordination),
super. (superordination), syno. (synonymy) and n.i. (not identified)

<i>50. fish continued</i>		
bowl	1	collo.
bubbles	1	collo.
cod	1	super.
cute	1	n.i.
disgusting	1	n.i.
Greece	1	collo.
healthy	1	n.i.
Japan	1	collo.
meat	1	coor.
ocean	1	collo.
smart	1	n.i.
sport	1	collo.
swim	1	collo.
vagina	1	n.i.
white	1	n.i.
work	1	n.i.
no answer	2	n.i.