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an analysis of Austrian grade 12 learners“

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Andrea Kugler

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To all those who supported me,

thank you!

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List of abbreviations

ANOVA	analysis of variance
AWL	Academic Word List
CEFR	Common European Framework of Reference
CLT	Communicative Language Teaching
COBUILD	Collins-Birmingham University International Language Database
DELT	Database of English Learner Texts
EFL	English as a Foreign language
ESL	English as a Second Language
FCE	First Certificate of English
L1	first language
L2	second language
L3	third language
LFP	Lexical Frequency Profile
TOEFL	Test of English as a Foreign Language
TTR	type-token ratio
UWL	University Word List
VKS	Vocabulary Knowledge Scale

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1. Introduction

"Words make a language" states Clark (1993: 1). "[W]ithout grammar very little can be conveyed, without vocabulary *nothing* can be conveyed" says Wilkins (1972: 111). These are just two examples of researchers who argue for the importance of vocabulary. Given this importance, it is surprising to discover that vocabulary has long been neglected in research. Only in the last few decades it has received increased interest. Still, there are aspects that are not fully understood or have simply not been given a lot of attention. One of these is lexical proficiency and productive language use. Only a few studies have been published in this area of research. The present study attempts to fill a void and investigates lexical proficiency in writing in a foreign language in the context of an Austrian upper-secondary school. The aim is to discover how lexically proficient Austrian grade 12 learners are who received six or eight years of English instruction. The first group learned English as their second foreign language or L3, while for those who learned English for eight years, it is their first foreign language or L2. Two text types, an argumentative essay and a letter written by the students are compared in order to determine which lexical characteristics the learner texts show and how both groups differ in lexical proficiency.

Defining lexical proficiency is not as straightforward as it might seem. Vocabulary knowledge is complex and involves various aspects such as knowledge of the form of a word, its meaning and how it can be used (cf. Nation 2001). Word knowledge alone, however, does not guarantee lexical proficiency. One also has to be able to quickly access this information in the mental lexicon. This is related to fluency and procedural knowledge (cf. Read 2004). Thus, it can be said that lexical proficiency involves both procedural knowledge, e.g. fluency, and declarative knowledge, e.g. knowing how a word is spelled.

The present study examines lexical proficiency and writing in a foreign language. Before the study will be presented, several questions will be addressed in order to gain a better understanding of lexical proficiency and vocabulary in general. These questions center on declarative knowledge, e.g. what is involved in knowing a word and how vocabulary is acquired, and procedural knowledge, e.g. what is involved in the writing process and how it is related to vocabulary. After considering theoretical perspectives, we will have a look at the Austrian curriculum and the Common European Framework of Reference (CEFR). The aim is to examine what Austrian students are expected to know concerning vocabulary when they graduate from upper-secondary school. Only then the findings of the study will be presented and discussed in detail.

2. Vocabulary: a long neglected area of research?

For a long time research areas such as grammar were in the main focus of researchers and English as a Foreign Language (EFL) methodologists, whereas vocabulary has long occupied an only secondary place. Zimmerman (1997), for example, provides an overview of the role of vocabulary in teaching methods throughout history. She comes to the conclusion that "although the lexicon is arguably central to language acquisition and use, vocabulary instruction has not been a priority in second language acquisition research or methodology" (Zimmerman 1997: 17). Often the role of grammar was in the foreground. During medieval times, for example, grammar received priority in learning Latin. The emphasis on grammar continued through the Renaissance, the Age of Reason and lasted until the late 20th century (Schmitt 2000: 10-14). Even in Communicative Language Teaching (CLT) vocabulary was initially neglected (Schmitt 2000; Zimmerman 1997). In this approach not grammar is central but communicative competence. The focus shifted to fluency, to functional aspects and to discourse, but vocabulary was still only of secondary importance (Schmitt 2000: 14). However, now vocabulary is also receiving some attention and "current best practice includes both a principled selection of vocabulary, often according to frequency lists, and an instruction methodology that encourages meaningful engagement with words over a number of recyclings" (Schmitt 2000: 14).

In research in general, vocabulary has only received increased attention in the last few decades (Henriksen 1999; Nation 2011). One possible explanation for this increased attention is that technological advances allowed to compile large corpora and thus, facilitated studying actual language use (O'Dell 1997: 261). Zimmerman (1997: 16) claims that in the 80s "more accurate language description" was needed and that corpora such as COBUILD (Collins-Birmingham University International Language Database) facilitated language description. Consequently, these new ways of analyzing language use resulted in a rethinking of the importance of vocabulary (Zimmerman 1997: 16).

Nation (2011: 530) claims that this increased interest in vocabulary can also be seen when considering that "over 30 % of the research on L1 and L2 vocabulary learning in the last 120 years occurr[ed] in the last 12 years [1999-2011]". Meara (2002) even argues that we are now in a phase of "rediscovery" of vocabulary. In the 1920s, for example, there was some research on vocabulary, but only recently researchers became interested in vocabulary again (Meara 2002: 406). Daller, Milton and Treffers-Daller (2007: 1) claim that over the past two decades vocabulary has developed from being a "Cinderella subject" to having a salient place in research. They describe the current position of vocabulary in research in the following way:

> Vocabulary is a lively and vital area of innovation in academic approach and research. The penalty we pay for working in so vital a subject area is that even recent, and excellent, surveys of the field are rapidly overtaken by new ideas, fresh insights in modelling and testing, a healthy re-evaluation of the principles we work under, and an ever-growing body of empirical research. (Daller, Milton & Treffers-Daller 2007: 1)

This highlights the fascination of studying vocabulary and the difficulties at the same time. There are constantly new insights and various studies are published. This makes it difficult to keep an overview. Although working in such a vital field presents some challenges, it also offers benefits. One of the most striking advantages is that there is still a lot to explore and to discover. This is one of the reasons why the present study focuses on lexical proficiency and writing.

In order to investigate lexical proficiency it is necessary to understand what is involved in knowing a word. The following chapter will describe the various approaches to defining vocabulary knowledge and its dimensions.

3. Dimensions of vocabulary knowledge

Knowing a word is not as simple as it might appear at first sight. Those who have tried to learn a foreign language would say that learning a word involves knowing the translation to the native language or L1. However, there is far more to know about a word. Aspects such as spelling, pronunciation, correct use or relation to other words also need to be considered. This suggests that learning a word is more complex than one would assume. Many researchers generally agree on the complexity of vocabulary knowledge (Daller, Milton & Treffers-Daller 2007; Milton & Fitzpatrick 2014; Nation 2001; Read 2004; Schmitt 2010). What it means to know a word cannot be easily described in theory, because there are just too many aspects to be considered. Read (2004: 224), for example, argues that researchers who work with vocabulary "are setting out to describe something that is inherently ill-defined, multidimensional, variable and thus resistant to neat classification." This underlines the multidimensional and variable nature of vocabulary knowledge. It might be one of the reasons why there are several distinct approaches to characterizing vocabulary knowledge.

In order to get a general overview, Milton and Fitzpatrick's (2014) overall categorization will be used here. They distinguish between component approaches, developmental approaches and metaphorical approaches. Component approaches provide lists of aspects that are related to word knowledge, developmental approaches describe how certain aspects develop throughout the process of vocabulary acquisition, while the third approach tries to grasp the complexity of vocabulary knowledge by illustrating it with a metaphor

(Milton & Fitzpatrick 2014: 1). Each of these approaches will be discussed in more detail below.

3.1. Component approaches

3.1.1. Word knowledge defined by Aristotle

Milton and Fitzpatrick (2014: 1) claim that Aristotle was one of the first who tried to identify characteristics of word knowledge. According to them, Aristotle focused on how reality and thought, normally expressed by words, are related. He distinguished between concept and form and identified four aspects of what it means to know a word:

- real world things
- impressions (perhaps the idea or concept of those things)
- spoken signs, and
- written signs
  (Milton & Fitzpatrick 2014: 2)

According to this, word knowledge includes both knowledge of word form in speech and writing, as well as the concept or meaning a word refers to and the thing that exists in reality.

3.1.2. Receptive and productive word knowledge

Centuries later, in the 20th century, researchers again dedicated attention to word knowledge. Palmer (1921), for example, suggested a distinction between receptive and productive knowledge. Receptive word knowledge involves understanding a word and is usually related to reading or listening, while productive word knowledge is associated with using words in writing and speaking (Schmitt 2000:4) The distinction between passive and receptive knowledge, or sometimes referred to as active or passive vocabulary knowledge, is widely accepted (Henriksen 1999: 306). Furthermore, it is generally assumed that learners acquire receptive before productive vocabulary knowledge (Schmitt 2000: 4). Henriksen (1999: 313), for example, suggests that "lexical items initially enter the learner's receptive vocabulary and may only subsequently become available for productive use."

Nevertheless, Schmitt (2000: 4) claims that it is not always true that reception precedes production. Learners can use words productively, for example, in speech, although they might not be able to recognize its written form in a reading passage. This has led researchers to think of the distinction between receptive and productive knowledge as a continuum. Melka (1997: 101) emphasizes that the idea of a continuum better describes the relationship between

receptive and productive vocabulary than a dichotomy. This is supported by considering that "some aspects may have become productive, while others remain at the receptive level" (Melka 1997: 87). This suggests that there is not a dichotomy of knowing a word either receptively or productively, but that it is rather a continuum along which aspects of knowledge are acquired. Melka (1997:85) thus refers to "degrees of knowledge". Similarly, Webb (2008: 90) argues that productive knowledge can be acquired partially before knowledge of certain receptive vocabulary features is gained and gives the following example:

> Advanced learners are likely to gain productive knowledge of form and partial productive knowledge of grammatical functions from seeing or hearing the form of an unknown word. This might occur before they gain receptive knowledge of its meaning.

According to this, in certain cases some aspects of productive vocabulary knowledge can be acquired before receptive knowledge. Overall, Webb (2008) and Melka (1997) agree that vocabulary knowledge can be acquired partially, but both also accept the basic assumption that reception precedes production.

In the present study the focus lies on the productive use of vocabulary in writing. In order to gain an even more detailed picture of vocabulary knowledge, let us now consider various lists that outline aspects of vocabulary knowledge.

3.1.3. Richards' and Nation's lists of word knowledge

Several researchers have attempted to capture the complexity of word knowledge by formulating a list of aspects that are needed for knowing a word. One of them is Richards (1976). He compiled a list of the following eight assumptions:

1. The native speaker of a language continues to expand his vocabulary in adulthood, whereas there is comparatively little development of syntax in adult life.
2. Knowing a word means knowing the degree of probability of encountering that word in speech or print. For many words we also know the sort of words most likely to be found associated with the word.
3. Knowing a word implies knowing the limitations imposed on the use of the word according to variations of function and situation.
4. Knowing a word means knowing the syntactic behavior associated with the word.
5. Knowing a word entails knowledge of the underlying form of a word and the derivations that can be made from it.
6. Knowing a word entails knowledge of the network of associations between that word and other words in the language.
7. Knowing a word means knowing the semantic value of a word.
8. Knowing a word means knowing many of the different meanings associated with a word. (Richards 1976: 83)

This list sheds some light on what is involved in knowing a word. For example, it acknowledges that word knowledge is connected to a variety of aspects such as syntax, semantic relations to other words, limitations concerning use, possible different meanings or morphological considerations. Furthermore, Richards (1976) emphasizes that vocabulary acquisition is a life-long process and does not stop once a person reaches adulthood. This assumption is quite different from the others on his list. It refers to vocabulary development, while the others are directly related to word knowledge.

A more recent approach to listing the components of word knowledge has been presented by Nation (2001). He developed one of the most well-known lists. Milton and Fitzpatrick (2014: 4) suggest that this is "the latest and, to date, most comprehensive version of this type of analysis." It also includes several of Richards' (1976) ideas, but provides a more comprehensive overview. Nation's (2001) list can be seen in table 1.

Table 1: What is involved in knowing a word (from Nation 2001: 27)

Form	spoken	R	What does the word sound like?
		P	How is the word pronounced?
	written	R	What does the word look like?
		P	How is the word written and spelled?
	word parts	R	What parts are recognizable in this word?
		P	What word parts are needed to express the meaning?
Meaning	form and meaning	R	What meaning does this word form signal?
		P	What word form can be used to express this meaning?
	concept and referents	R	What is included in the concept?
		P	What items can the concept refer to?
	associations	R	What other words does this make us think of?
		P	What other words could we use instead of this one?
Use	grammatical functions	R	In what patterns does the word occur?
		P	In what patterns must we use the word?
	collocations	R	What words or types of words occur with this one?
		P	What words or types of words must we use with this one?
	constraints on use (register, frequency, …)	R	Where, when, and how often would we expect to meet this word?
		P	Where, when, and how often can we use this word?

Nation (2001) basically distinguishes between form, meaning and use and incorporates the levels of reception and production. Each category also includes subcategories. Knowledge of form, for example, involves knowing the written and spoken form of a word and its word parts. Knowing meaning requires considering how form and meaning, concept and referents

are related and how words are associated with each other. The aspect of use relates to grammatical functions, collocations and constraints on use, such as register constraints.

In order to illustrate how this framework can be applied, Nation (2001) gives an example. He summarizes what one needs to know about the word *underdeveloped* in order to use it productively:

- being able to say it with correct pronunciation including stress
- being able to write it with correct spelling
- being able to construct it using the right word parts in their appropriate forms
- being able to produce the word to express the meaning 'underdeveloped'
- being able to produce the word in different contexts to express the range of meanings of *underdeveloped*
- being able to produce synonyms and opposites for *underdeveloped*
- being able to use the word correctly in an original sentence
- being able to produce words that commonly occur with it
- being able to decide to use or not use the word to suit the degree of formality of the situation (At present *developing* is more acceptable than *underdeveloped* which carries a slightly negative meaning.)
  (Nation 2001: 28)

This serves as a clear example. It shows how complex word knowledge is and what it might involve. Knowing the word *underdeveloped* basically requires knowledge of its form, its meaning and its use.

In order to gain a deeper insight, let us now consider the individual aspects of knowing a word in more detail. The emphasis here will lie on productive knowledge, since this is the focus of the present study.

3.1.3.1. Form

A rather obvious aspect of word knowledge is form. One needs to know the form of a word in order to use it in production or to recognize it in reading or listening. Schmitt (2000: 45) argues that both the written and spoken form occupy a central place among the types of word knowledge due to the fact that "without the ability to recognize or produce a word, any other kind of knowledge is virtually useless."

Spoken form

Knowledge of the spoken form refers to how a word is pronounced. Using words in speaking involves phonological knowledge. This refers to the clear pronunciation of words so that the interlocutor can understand individual words that form part of a sequence (Schmitt 2000: 53).

In order to pronounce a word clearly, a speaker has to know the distinct phonemes of a word, as well as how these are combined into a certain word (Schmitt 2000: 53). In addition to knowledge of phonemes, it is also necessary to have an understanding of the syllables a word contains, since this is important for distinguishing between stressed and unstressed syllables (Schmitt 2000: 53). In English words that consist of various syllables require putting an emphasis on one or more syllables (Schmitt 2000: 53). These aspects of phonological knowledge account for the spoken form of a word, but what about the written form?

Written form

Concerning the written form of a word, Nation (2001: 27) presents a brief summary by asking "how is the word written and spelled?" This suggests that spelling and orthographical knowledge are essential for this aspect of word knowledge. Learners need to memorize how letters are combined into words. In general, spelling depends on the learners representation of how a language is phonologically structured (Nation 2001: 45). Learners can access these representations in two basic ways: One is based on the relation between symbols and sounds, while the other relates to words being represented as a whole (Nation 2001: 45). Nevertheless, Nation (2001: 45) claims that this would be too easy, since the two affect one another and choosing one of them is determined by "the type of processing demands." Thus, it can be said that there are two basic ways of how representations of phonological structure are accessed and these are interconnected.

For foreign language learners, mastering the spelling system seems to be especially challenging. They have to learn how sounds and symbols correspond (Schmitt 2000: 52). Sometimes there are irregularities in spelling. In these cases also visual information in addition to phonological information is of importance for orthographic knowledge (Schmitt 2000: 48). Schmitt (2000: 65) argues the following: "Productively, learners need to develop 'visual images' of words that are exceptions to spelling rules in addition to their knowledge of sound-symbol correspondences." This suggests that memorizing how irregular words are spelled can be facilitated by creating a "visual image" of the whole word and by developing a sense of when a word looks correct.

Summarizing the information on written form, it can be said that language users need to learn how sounds and symbols correspond and ideally, they develop "visual images" to memorize the spelling of a word. This is especially important in cases where spelling is not regular. In addition to how words are spelled in writing or pronounced in speech, knowledge of word parts is also an essential aspect of form.

Word parts

Knowing the form of a word involves knowing the parts it contains and these basically fall into two categories: stems and affixes (Nation 2001: 46). This aspect of word knowledge is concerned with morphology and how affixes are added to a stem (Schmitt 2000: 61). One can distinguish between inflection and derivation. Inflection results in "alternative grammatical forms of words" that do not change the lexical item but rather are variants of one word (Jackson & Amvela 2000: 70). For example, adding the inflectional plural morpheme to *cat* results in the word form *cats*. Both words still are nouns and represent basically the same. Whereas derivation leads to the creation of different lexical items and involves changing the word class (Carter 2012: 25). For example, adding the suffix *–ible* to the noun *access* changes the word class and results in the adjective *accessible*.

According to which type affixes belong, the words are even processed differently in the mental lexicon (Schmitt 2000: 62): derivational forms are stored as one unit (e.g. *resentful*) that can be evaluated in terms of their word parts (e.g. *resent* and *ful*) if needed, whereas for inflectional forms, the stems are stored as one unit and the inflectional affixes are then added in production. For example, the verb *give* is stored as one lexical item in the mental lexicon. Only when the speaker uses the word in speech the necessary inflectional affix is added to the stem, e.g. *gives*.

Knowing the parts of a word and its spelling or pronunciation is of great importance, but this knowledge alone would not be very useful without knowing the meaning of a word.

3.1.3.2. Meaning

The component of meaning involves three major aspects: form and meaning, concept and referents, and associations. These categories can also be seen in Aitchison's (2012: 211) description of how children acquire word meaning. There are basically three tasks: (a) Labeling: Children learn that a certain combination of sounds refers to a certain thing or entity. Clark (1993: 14) calls this mapping. (b) Packaging: They discover what can be meant with one label or, as Aitchison (2012: 211) puts it, "they must find out which things can be packaged together under one label". (c) Network building: This involves developing an understanding of how the different words are related to each other. Aitchison's (2012) description highlights that learners need to know the underlying concepts and referents in order to connect the meaning of a word to its form. Additionally, words are related to others in the mental lexicon. There is a whole network of various relations among them, such as

sense relations. This basically summarizes Nation's (2001) category of knowledge of meaning. Children connect form and meaning, they identify the referents or concepts and then they develop networks and relations among words in the mental lexicon. Let us now have a look at each of Nation's (2001) categories.

Form and Meaning

Knowing a word requires knowing both the form and the meaning of a word. Nation (2001: 47-48) suggests that these two elements have to be connected to each other. Sometimes, however, learners struggle with this. They might know the form of a word, but might not understand its meaning. The other way round is also possible: Learners have an understanding of the meaning or the concept, but do not know the form to express it. In these cases form and meaning are not connected to each other. Nation (2001: 48) illustrates this by the example of the word *brunch*: A person who learns English as an L2 may know the form of this word, but possibly not its meaning. The learner could also have an idea of the concept of a meal that combines lunch and breakfast, but might not know the form of the word *brunch*. It is even possible that a learner has knowledge of the form and the meaning, but has not connected them. Knowing a word, however, exactly asks for this connection between form and meaning. One has to know that *brunch* refers to a meal that is a combination of lunch and breakfast.

A strong form-meaning connection allows for fluency in productive language use as well as in listening or reading, since it influences how quickly one can access information in the mental lexicon (Nation 2001: 48). When we read a text and know the word forms and quickly connect them to their meanings, we can read quickly. The same is true for productive skills. The faster we can access the word forms that are connected to the meaning we would like to convey, the more fluently we can speak or write.

Sometimes, however, the relation between form and meaning is not that clear. There are word forms that have various meanings. This phenomenon is referred to as polysemy. Polysemous words have one form but several meanings (Jackson & Amvela 2000: 58). For example, the word form *bank* can refer to the piece of furniture one can sit on, but also to the financial institution where people can put their savings or take out loans.

Aitchison (2012: 174) suggests that polysemy is characterized by "coexistence" and "replacement". New meanings of words might develop and occur alongside the original meaning of an existing word. These different meanings can persist over centuries. One day a sense can even get lost again. According to this, polysemy seems to be a result of language change. Meaning can change over time and this might result in polysemous words. Also

McCarthy, O'Keeffe and Walsh (2010: 17) refer to this phenomenon. They argue that "changes in society bring about changes in meanings" and they illustrate this by the example of *mouse* (McCarthy, O'Keeffe & Walsh 2010: 17). The word *mouse* now refers to the animal as well as the input device used for computers.

Another aspect that is related to various meanings is homonymy. Homonymy refers to words with the same form but different meanings due to etymological reasons (Jackson & Amvela 2000: 61). One can distinguish between homophones, i.e. words with the same pronunciation (e.g *buy* and *by*), and homographs, i.e. words that are spelled the same (e.g. *off*) (Carter 2012: 27). Language users need to be aware of these differences in meaning.

As can be seen here, meaning and form need to be connected in order to use language fluently. Additionally, language users need to know that there are words that look or sound the same but differ in meaning. The question arises of what meaning actually implies. Schmitt (2000: 23) offers a basic definition: "[M]eaning consists of the relationship between a word and its *referent* (the person, thing, action, condition, or case it refers to in the real or an imagined world)."

Concept and referents

Words usually refer to something that exists in reality or in imagination. The relation between a word form and its referent determines meaning. This relation, however, is arbitrary and "not inherent" (Schmitt 2000: 23). Only when speakers of a language agree on a certain word for a specific referent, this word receives a meaning (Schmitt 2000: 23). Although this might sound simple, it is in fact not. Schmitt (2000: 23) summarizes the complexity of this issue:

> Unfortunately, the relationship between a word and its referent is not usually a tidy and direct one. In some cases, the referent is a single, unique entity that the word can precisely represent, usually as a 'proper noun' (*Abraham Lincoln, Eiffel Tower, Brazil*). But more often, it is really a class or category such as *cat*, *love* or *uniform*. There are many different kinds of uniforms, and so the single word *uniform* cannot exactly describe each one. Rather, it represents our *concept* of what a uniform generally is like. We know that it is a standardized form of dress, but would be quite open to differences in color and insignia, for example. In fact, our concept of a uniform depends to a large extent on our exposure to uniforms of various types.

This suggests that we should consider the idea of concept instead of referent, since there is not always a one to one correspondence between a word and a single referent. Often a word rather refers to a category. Everyone has a different image or concept that we associate with a particular word form and this is mainly based on personal experience. For example, the word *bicycle* refers to a concept and not a single referent. One person might think of a blue

mountain bike, while others would imagine it to be a red city bike. Apart from this personal aspect, meaning is also based on shared assumptions with other language users. The word *bicycle* is used by speakers of English to refer to a vehicle with two wheels that requires pedaling.

Considering that meaning involves both what society agrees on and personal experience, some linguists have proposed a distinction between core meaning, i.e. "essential meaning", and encyclopedic knowledge, i.e. added information that does not change the essential meaning (Aitchison 2012: 58). Schmitt (2000: 27) suggests that core meaning can be seen "as the common meaning shared by members of a society", while encyclopedic knowledge "is idiosyncratic to each individual person". It is based on what people believe and what they have experienced.

The question arises of how the core meaning of a word can be described. Schmitt (2000: 23) states that according to a "traditional view", defining a word is based on the sum of all the essential characteristics of a certain concept. He gives the example of the word *cat*: A cat can be described as having four legs, whiskers, being furry, meowing and drinking milk (Schmitt 2000: 24-25). However, this would be too simplistic. Schmitt (2000: 24) argues that there might be exceptions and gives the example of a cat with only three legs or a cat that is not able to meow. He concludes that deciding on the essential semantic characteristics is challenging both because of considering what to count as essential and which features to include or not (Schmitt 2000: 24).

Similarly, Aitchison (2012) criticizes the idea of meaning as being something fixed. She claims that only a small number of words are clearly characterized by essential features (Aitchison 2012: 57). She further summarizes the main issues:

> The majority of words […] suffer from one or more of the following problems. First, it may be difficult to specify a hard core of meaning at all. Second, it may be impossible to tell where 'true meaning' ends and encyclopedic knowledge begins. Third, the words may have 'fuzzy boundaries,' in that there may be no clear point at which meaning of one word ends and another begins. Fourth, a single word may apply to a 'family' of items which all overlap in meaning but do not share any one common characteristic. (Aitchison 2012: 63)

According to this, it is difficult to define essential characteristics that belong to the core meaning of a word. It is not clear where the boundaries between core meaning and encyclopedic knowledge are. The boundaries rather allow for some degree of overlap. Similarly, the meanings of different words can also overlap. From this, Aitchison (2012: 63) concludes that for most words there are no fixed but rather "fuzzy" meanings.

So if meaning is fuzzy, how do speakers cope with this issue? In order to address this issue of fuzziness, prototype theory can be considered (Schmitt 2000: 24-25). One of the most influential studies on prototypes was conducted by Rosch (1975). She addressed the question of what people consider to be prototypical within a category. It has to be noted here that according to Rosch (1975: 199) "no claim is made that the internal structure of semantic categories should be universal for all cultural groups." This seems to suggest that prototypes are culturally determined. The participants of her study were college students who were native speakers of English. Thus, her results show what native speakers of English consider to be prototypical within a category. Among the categories she examined were birds and vegetables. Rosch (1975) found that a robin was considered the best example of a bird and peas were seen as prototypical vegetables. Overall, Rosch's (1975) findings suggest that language users have an idea of a prototype and its ideal characteristics. When they decide whether a word falls into a certain category or not, they compare its characteristics to the prototype. These only have to overlap to a certain degree. If we go back to the example of the cat, we can see that the theory of prototypes allows a cat with only three legs to form part of the concept of a cat (Schmitt 2000: 25). It still shows enough similar features compared to the prototypical cat. For example, it is furry and has whiskers.

This allows for dealing with the fuzziness of word meaning within a category, but what about other words? Schmitt (2000: 25) suggests that comparing words to other words and their concepts is a useful way for handling fuzzy meanings. This refers to sense relations and how words are associated with each other.

Word associations

Words should not be considered in isolation, but as being associated with other words, since words form part of a whole network that is stored in the mental lexicon. In the mental lexicon words are linked to each other in several ways. In order to gain a better understanding of how words are connected to each other, there has been some research on word associations. Schmitt (2000: 39) states that there are basically three major categories: syntagmatic associations, i.e. words that can occur next to each other in a sequence, paradigmatic associations, i.e. words that are related to each other on a semantic level and usually belong to identical word classes, and clang associations, i.e. words with comparable forms. He then summarizes the main findings of association studies and concludes that "responses tend to shift from being predominantly syntagmatic to being predominantly paradigmatic as a person's language matures", while the number of clang associations declines (Schmitt 2000:

40). This suggests that learners move from syntagmatic associations such as collocations to paradigmatic associations, e.g. sense relations. Learners, thus, shift to a more meaning oriented organization of the lexicon and rely less on syntagmatic considerations and phonological information.

This is even confirmed by association studies concerning the L2 mental lexicon. Some rather recent studies investigated association patterns in the L1 and L2 mental lexicon. For example, Zareva (2007) found that both native and non-native speakers show mostly paradigmatic connections in their responses to the association test and a smaller number of syntagmatic associations. Similarly, Wolter (2001) has discovered that there are similarities between the L1 and L2 mental lexicon: Both show a shift from phonological rather than semantic connections to syntagmatic and paradigmatic connections. This does not mean that old connections are replaced, it rather suggests that "later connections become dominant" (Wolter 2001: 66). All in all, one can say that as the mental lexicon develops, phonological information seems to get less relevant, whereas syntagmatic and mainly paradigmatic connections get stronger.

Let us now consider some of the paradigmatic relations in more detail. One way of classifying paradigmatic relations is concerned with sense relations. These include, for example, hyponomy, antonymy and synonymy. Hyponomy refers to the fact that there are words characterized by a high degree of specificity while others are more general (Carter & McCarthy 1988: 25). Words are related in terms of a hierarchy. A distinction can be made between hypernyms, i.e. the superordinated words, and hyponyms, i.e. the subordinated words. For example, *bird* is a hypernym in relation to *robin*, which is a hyponym. Carter and McCarthy (1988: 25) state that the semantic relation between a hypernym and a hyponym is "unilateral". A *robin* is a *bird*, but a *bird* does not automatically have to be a *robin*. The reason for this is that there are various types of birds. There are, for example, *owls*, *doves* or *sparrows*. These are so-called co-hyponyms of *robins*. Overall, the relation between hypernyms and hyponyms can be represented by tree-diagrams. An example is presented in figure 1.

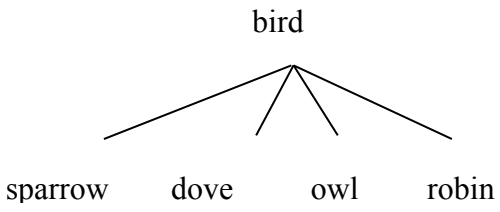

Figure 1: Example of hypernymy

Figure 1 illustrates that *sparrow*, *dove*, *owl* and *robin* are subordinated to the more general term *bird*. Thus, they are organized in terms of hierarchical relations.

Apart from this type of semantic relations, there are also several other types, for example synonymy and antonymy. Antonymy refers to oppositeness of meaning. There are two basic types: graded and ungraded antonymy. Ungraded antonomy refers to "exclusive oppositeness", e.g. *alive*/*dead* or *pass*/*fail* (Schmitt 2000: 26). One either passes or fails, there is nothing in between. Whereas graded antonyms can be part of a continuum (Schmitt 2000: 26). For example, *cool* is somewhere between *cold* and *warm*. In contrast to antonymy, synonymy is associated with similarity of meanings. If two or more word forms have the same meaning, they are synonyms. An example is *almost* and *nearly*. These two different word forms have the same meaning. However, it has been argued that meaning rarely overlaps completely (Aitchison 2012: 106). For example, the words *begin* and *start* are considered synonyms, but they cannot be used with the same collocates in some contexts: One can *start a car*, but not **begin a car* (Carter & McCarthy 1988: 29). Instead of the idea of perfect synonymy, Carter and McCarthy (1988: 29) suggest to consider "local synonymy". Certain contexts allow for interchangeability of words. For example, *begin* and *start* can be used interchangeably in some contexts. One can say *begin to read* and also *start to read*.

Apart from these sense relations, the mental lexicon is also organized in terms of semantic fields. Jackson and Amvela (2000: 92) define semantic fields as consisting of "words that belong to a defined area of meaning". An example would be *schooling* (Clark 1993: 9). Words such as *teacher*, *teach*, *student*, *learn* or *school* belong to this semantic field. As can be seen, these words are clearly related to the meaning of *schooling* and thus, can be said to form part of a semantic field.

So far we have considered the aspects of meaning and form, let us now have a look at the third major part of word knowledge.

3.1.3.3. Use

In order to know how to use a word, one needs to have an understanding of grammatical functions, collocations and constraints on use.

Grammatical functions

Grammatical functions are an essential part of word knowledge. Nation (2001: 55) explains the importance of knowing grammatical functions in the following way: "In order to use a

word it is necessary to know what part of speech it is and what grammatical patterns it can fit into". This suggests that grammar and vocabulary should be seen as interconnected. Grammar plays an important role in relation to vocabulary. Part of speech or word class "describes the category of grammatical behavior of a word" (Schmitt 2000: 59) and thus, provides information on how words can be used.

Additionally, knowledge of grammatical functions is also related to syntax. Entries in the mental lexicon contain syntactic information (Clark 1993: 4). An example would be verbs. Syntactic information of a certain verb contains the type of syntactic category, i.e. verb, and how many arguments there are (Clark 1993: 4). Transitive verbs, for example, can have two arguments, a subject and a direct object, while for intransitive verbs there is only one argument (Clark 1993: 4). Syntactic information also includes the role of the argument, e.g. agent, theme or location (Clark 1993: 4). This can be illustrated by the following examples:

> So an intransitive verb like *run* would list a single argument (subject) in the syntactic portion of its entry, with the role of agent, as in *The boy runs*; transitive *read* would list two arguments, subject and direct object, with the roles of agent and theme respectively, as in *The child read the book*; and transitive *put* would list three arguments (subject, object, and oblique) with the roles agent, theme, and location, as in *The woman put the flowers on the table*. (Clark 1993: 4)

As can be seen here, syntactic information of a verb does not only contain information on the number of arguments but also on the role of these arguments. All in all, syntactic information allows speakers to use words correctly in sentences.

Interestingly, Schmitt (2000: 60) argues that for native speakers to be able to use a word in a grammatically correct way, explicit knowledge of its word class is not necessary. This suggests that speakers only need to know the grammatical functions of words implicitly, so that they can use them correctly in speech or writing. They do not need to be able to describe this on a meta-level, as long as they can apply it in practice.

To summarize, knowledge of grammatical functions is closely linked to word knowledge and is an essential aspect of being able to use a word. A language user needs to know how words behave grammatically and how they are influenced by possible syntactic considerations. Still another factor that has an impact on the level of use is collocation.

Collocations

When we use a word, we need to know what word can occur before and after it. The way words can be used together in a sequence is called collocation. One can distinguish between two basic types of collocations: lexical collocations and grammatical collocations (Benson

1985). Grammatical collocations include grammatical words. Normally they contain a preposition after a noun, adjective or verb (Benson 1985: 61). An example is *account for*. It contains a verb and a grammatical word, a preposition. In contrast to this, lexical collocations involve combinations of words that are "equal" and do not imply subordination (Benson 1985: 62). These include combinations such as verbs and nouns (e.g. *spend money*), adjectives and nouns (e.g. *strong coffee*), or nouns and verbs (e.g. *dogs bark*). Apart from these basic types of collocations, there are also collocations that do not fall into these two categories. These include, for example, prepositions used in time expressions (e.g. *on Tuesday*, *at five o'clock*), since these are based on arbitrariness rather than on logic (Allerton 1984, referred to in Schmitt 2000: 77).

Although it is possible to classify collocations, it has to be noted that there is a great variety of different collocations. Nation (2001: 56) suggests that collocations can vary, for example, in terms of range or size. Some words might collocate with various others, e.g. *commit a crime* or *commit suicide*, while other collocations might be more restricted. Concerning size, it can be said that there are differences in how many words belong to a collocation. Not only do collocations differ in size or range, but also in how close collocates are. Nation (2001: 56) gives the following example: "*expressed* their own honest *opinion*". In this case there are several words between the two collocates. As can be seen, words can be combined in various ways.

Given the great variety of how words can be combined, acquiring knowledge of collocations seems to be challenging and can therefore be difficult for language learners. They need to learn how certain words appear together, while other combinations are not possible. Fortunately, there are also a number of fixed expressions in a language that one can learn. These are sometimes referred to as chunks. Schmitt (2000: 101) suggests that chunks "act as prefabricated language units that can be used as wholes, rather than being composed through vocabulary + syntax." Thus, it can be assumed that these chunks can be stored as one entry in the mental lexicon and are easier to process. In general, chunks can help learners to use language fluently (Schmitt 2000: 127).

As can be seen here, collocational knowledge and knowledge of chunks is another important part of word knowledge.

Constraints on use

There are several factors that can affect or limit the use of words. One of the most striking is concerned with register. Register "describes the stylistic variations that make each word more

or less appropriate for certain language situations or language purposes" (Schmitt 2000: 31). This means that a word or expression might be appropriate in a specific situation, while it might not be suitable in another one.

Halliday (1979) discusses three aspects that determine register: Field, tenor and mode. Field refers to the "social action in which the text is embedded" (Halliday 1979: 110), e.g. what is intended to achieve with a certain message. Tenor describes the roles and relations between those who communicate with each other. This determines, for example, how formal a conversation is. Mode refers to "the channel or wavelength selected" (Halliday 1979: 110). This includes, for example, whether it involves written or spoken interaction. Halliday (1979: 122-123) argues that these three aspects "act collectively as determinants of the text through their specification of the register." Thus, it can be concluded that linguistic and lexical choices in speaking or writing are determined by field, tenor and mode. One chooses words according to what one would like to achieve with a certain message. Whether it is written or spoken language also influences linguistic choices. For example, in a formal letter one might not use colloquial expressions that are common in oral language. Additionally, the relation between the interlocutors may have an impact on how a person expresses a message. Having a conversation with one's boss differs from talking to friends or family members. These two conversations usually involve different lexical choices. This suggests that a variety of situations and contexts require different stylistic decisions. Register might pose constraints on the use of certain words. Language users need to be aware of register restrictions in order to use words appropriately.

Overall, Nation's (2001) list of what is involved in knowing a word provides a useful framework for characterizing vocabulary knowledge, since it acknowledges both item and system knowledge. Nation (2001:58) says that when considering the various aspects of word knowledge, there is a choice "between attention given to the systems which lie behind vocabulary (the affixation system, the sound system, the spelling system, collocation, the grammatical system, lexical sets) and the unique behaviour of each word." Thus, knowing a word involves having an understanding of form, meaning and use of an individual word as well as how it is related to other words and the underlying system. This seems to reflect the organization of the mental lexicon. Learners store information about single items and how they are connected to others in the mental lexicon.

So far we have considered various component approaches among which Nation's (2001) list is the most detailed one. Milton and Fitzpatrick (2014: 6) state that in parallel to the development of such detailed lists, there were also several attempts to find simpler models

with fewer dimensions of vocabulary knowledge. One approach was to distinguish between depth and breadth of vocabulary knowledge. This was later incorporated into the lexical space metaphor.

3.2. Metaphorical approaches

Several approaches aim at illustrating word knowledge by using a metaphor. One of the most prominent metaphors is the lexical space (Daller, Milton & Treffers-Daller 2007). The lexical space consists of three dimensions: breadth, depth and fluency. For illustration, figure 2 shows how these dimensions can be represented:

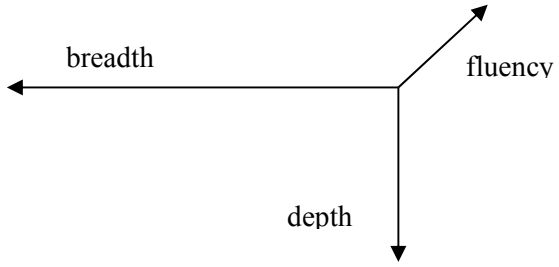

Figure 2: The lexical space (from Daller, Milton & Treffers-Daller 2007: 8)

The distinction between breadth and depth was originally introduced by Anderson and Freebody (1981), only later was the third dimension of fluency added. They define breadth and depth of vocabulary knowledge in the following way:

> It is useful to distinguish between two aspects of an individual's vocabulary knowledge. The first may be called 'breadth' of knowledge, by which we mean the number of words for which the person knows at least some of the significant aspects of meaning. […] [There] is a second dimension of vocabulary knowledge, namely the quality or 'depth' of understanding. We shall assume that, for most purposes, a person has a sufficiently deep understanding of a word if it conveys to him or her all of the distinctions that would be understood by an ordinary adult under normal circumstances. (Anderson & Freebody 1981: 92-93)

Breadth is concerned with how many words a learner knows, while depth refers to the quality of vocabulary knowledge and how well a learner knows the various aspects of vocabulary knowledge.

Daller, Milton and Treffers-Daller (2007: 7-8) suggest that the distinction between breadth and depth can even be combined with Nation's (2001) framework: Breadth contains the category of form and the subcategory of form and meaning, while all the other aspects (meaning: concepts and referents, associations; use: grammatical functions, collocations, constraints on use) form part of depth.

In addition to the dimensions of depth and breadth, Meara (1996) suggested a third dimension. This third component is concerned with the degree of automaticity a learner can access words and use them. Daller, Milton and Treffers-Daller (2007) include this aspect in the concept of the lexical space as fluency. Adding the aspect of fluency seems to be an advantage of this approach. Milton and Fitzpatrick (2014) acknowledge that the metaphor of the lexical space allows for distinguishing between declarative and procedural knowledge. The model with three dimensions permits making a distinction between learners who possess a good declarative knowledge, i.e. a large vocabulary size and knowledge about lexical items, but have difficulty with using the words and those who know comparatively fewer words but can access them quickly, i.e. procedural knowledge (Milton & Fitzpatrick 2014: 7).

This illustrates the importance of fluency for productive and receptive use of vocabulary. Successful language users need to have knowledge about words, e.g. their word form, meaning, etc., but also need to be able to access this information quickly. In earlier approaches the focus was mainly on declarative knowledge and what learners need to know about a certain word, but not necessarily on how automatically learners can access words in the mental lexicon. The notion of lexical space now includes both declarative and procedural knowledge and appears to capture the complexity of vocabulary knowledge. This is why the metaphor of the lexical space seems to be useful and thus will be used as a basic framework for the present study. Before actually discussing the study, we will have a look at still another way of conceptualizing vocabulary knowledge. Approaches that fall under this category are concerned with developmental aspects.

3.3. Developmental approaches

Developmental approaches are concerned with how vocabulary knowledge develops. Milton and Fitzpatrick (2014: 8) suggest that some aspects of knowledge are acquired before others and they give the following examples:

- The form of a word is acquired before one learns about its collocations.
- It seems that developing breadth is necessary for depth to grow, because "the possibility of a dense matrix of links between words can only exist once many words have been acquired" (Milton & Fitzpatrick 2014: 8).
- Productive and receptive vocabulary knowledge can be seen as developmental stages, as points of a continuum or as two elements of vocabulary knowledge that differ in

quality. Here they refer to Melka's (1997) suggestion of degrees of knowledge (cf. *3.1.2. Receptive and productive word knowledge*).

One approach that also considers the developmental aspect of depth and the distinction between receptive and productive knowledge is presented by Henriksen (1999). She suggests that there are three dimensions of vocabulary knowledge that can be considered separately, but are still connected to each other. She distinguishes between the partial-precise dimension, the depth of knowledge dimension and the receptive-productive dimension.

Henriksen (1999) sees these three dimensions as continua where vocabulary acquisition takes place. As learners improve their vocabulary knowledge, they move from having only partial knowledge to precise knowledge. Henriksen (1999: 311), for example, argues that at the beginning a learner's understanding of the meaning of a word is vague and only progressively moves to a higher degree of precision. This does not mean that each word will be completely known at a certain point, it rather refers to a continuum with varying degrees of partial knowledge. This first dimension refers to the semantization process and is mainly related to the mapping process (i.e. mapping meaning onto form), while the second dimension, depth of knowledge, is concerned with building networks among words (Henriksen 1999: 312). The aspect of building strong networks is especially important for acquisition, since "rich meaning representation, or deep understanding of the paradigmatic relations, is a crucial factor for developing precise understanding as well as productive control" (Henriksen 1999: 314). In addition to gradually developing more precise knowledge and building strong relations among words, there is a development from receptive to productive vocabulary knowledge. According to Henriksen (1999: 313), words are learned receptively first and only later might be used productively, but still words can also just remain receptively known and might never be used in writing or speech. All in all, Henriksen (1999) provides an overview of how a learner's lexicon can develop along three dimensions: from partial to precise knowledge, building stronger networks at the dimension of depth, and moving along a continuum from receptive to productive vocabulary knowledge.

Another approach to describing the development of word knowledge was developed by Paribakht and Wesche (1993). They designed the Vocabulary Knowledge Scale (VKS) which was originally created to measure intermediate English as a Second Language (ESL) students' development of comprehension (Paribakht & Wesche 1993) and was later also used to investigate how various activities that combine vocabulary and reading influence vocabulary learning (Paribakht & Wesche 1997). The VKS consists of five categories:

1. The word is not familiar.
2. The word is familiar but its meaning is not known.
3. A correct synonym or translation is given.
4. The word is used with semantic appropriateness in a sentence.
5. The word is used with semantic appropriateness and grammatical accuracy in a sentence. (Paribakht & Wesche 1997: 181)

These categories describe developmental stages. Learners move from recognizing the form of a word to understanding its meaning and how it can be used appropriately and in a grammatically correct way. Milton and Fitzpatrick (2014: 9) suggest that this scale can also be related to Nation's (2001) list, since it can be said that "knowledge of form precedes knowledge of meaning, which precedes knowledge of use". In this sense, Nation's (2001) list can also be considered a "developmental sequence" (Milton & Fitzpatrick 2014: 9).

As can be seen here, some aspects of word knowledge are learned before others. This is why vocabulary development can be described as "incremental in nature" (Schmitt 2000; 2010). A learner acquires knowledge about the form of a word, its meaning and use in an incremental way rather than gaining all that information at once or only after encountering a word a few times (Schmitt 2010: 20). This can also be linked to the idea of partial knowledge (Henriksen 1999). Aspects of word knowledge will be known partially first before they are fully mastered.

Although vocabulary acquisition is incremental, it is not necessarily linear. Daller, Turlik and Weir (2013: 213) argue that vocabulary development is not linear, since vocabulary develops quickly at first, but then the learning curve levels out. This is also supported by Fitzpatrick and Milton (2014: 175) who also refer to vocabulary as being dynamic. It can even be said that learning a word can be characterized as "a state of flux" (Schmitt 2010: 23), since some aspects of vocabulary knowledge might only be known partially, while others might even be forgotten (i.e. attrition). This "state of flux" of word knowledge lasts until the word is "fixed" in the mental lexicon (Schmitt 2010: 23).

Now we have already entered the area of vocabulary acquisition by considering some developmental aspects of vocabulary knowledge. In the following chapter vocabulary acquisition will be discussed with a special focus lying on acquiring vocabulary in a foreign language.

4. Vocabulary acquisition

So far it has been discovered what it means to know a word and it has been concluded that vocabulary knowledge is complex and multidimensional. It involves both item knowledge and system knowledge, as well as declarative and procedural knowledge. Acquiring a large vocabulary seems to be challenging. It is even more complicated for non-native speakers who learn a foreign language and who are not constantly surrounded by their target language. Nevertheless, there are numerous learners who reach almost native-like proficiency. Irrespective of whether learners wish to speak like a native speaker or want to communicate successfully with other non-native speakers in an international setting, learners need to acquire a large amount of words. But how do learners deal with this challenge? How many words do learners of English really need to know? How do they acquire vocabulary in a foreign language? And what makes a word easy or difficult to learn? All these questions will be addressed in the following chapters.

4.1. How many words do learners need to know?

Before considering how many words learners need to know, let us first have a look at a native speaker's vocabulary size. Throughout their lives people acquire a large vocabulary. Some researchers presented estimates of a native speaker's vocabulary size. D'Anna, Zechmeister and Hall (1991), for example, estimated that a typical undergraduate student's vocabulary size is 16,785 words. Similarly, Goulden, Nation and Read (1990) discovered that a university graduate's vocabulary contains roughly 17,000 base words. These estimates are a little lower than Nation and Waring's (1997) figures. They suggest that a native speaker knows around 20,000 word families. Although the numbers vary, Schmitt (2010: 6) claims that estimates between 16,000 and 20,000 word families appear to be reasonable.

These numbers seem to be quite high. Is it plausible to set this as a goal for language learners? Schmitt (2000: 4) argues that it might be possible for learners to build a vocabulary similar in size to native speakers, but it would be "ambitious". Similarly, Nation (2001: 9) claims that although it might be possible for non-native speakers to acquire 20,000 word families, it is "way beyond what most learners of English as another language can realistically hope to achieve."

But still there is some hope for language learners: It is not necessary for learners to reach a vocabulary size that is comparable to native speakers if they wish to become proficient speakers of English (Schmitt 2010: 7). For productive language use only several

thousand word families are needed. Nation and Waring (1997: 10), for example, suggest that 2,000 to 3,000 word families are necessary for writing or speaking. Similarly, Nation (2008: 83) claims that numerous ideas can be expressed by only knowing approximately 2,000 to 3,000 words. Furthermore, there are certain words that are "more useful" compared to others (Nation 2001: 9). These are high frequency words. Only the 2,000 most frequent words fall under this category (Nation 2001: 14). Nation (2001: 13) argues for their importance due to the fact that "these words cover a very large proportion of the running words in spoken and written texts and occur in all kinds of uses of the language."

High frequency words cover a large proportion of texts. Milton (2009: 54), for example, claims that when knowing the 2,000 most frequent words, a learner reaches a point at which "gist understanding" is possible. This is further supported by considering text coverage: Milton (2009: 46) summarizes the results of various studies and concludes that by knowing 2,000 words 80 % of a text are covered. This again emphasizes the importance of high frequency words, since only knowing 2,000 words, a small number compared to 16,000 or 20,000 word families, already allows for understanding 80 % of a text. Thus, 2,000 words seem to be a plausible goal for beginning learners. Nation (2001: 16) argues that both learners and teachers should devote a lot of time to high frequency words, since "[t]he time spent on them is well justified by their frequency, coverage and range."

More advanced learners will likely need to understand more than just gist. In order to reach full comprehension knowing at least 95 % of the words in a text is necessary (Milton 2009: 51). Another figure that has sometimes been suggested is 98 %. Hu and Nation (2000: 422) found that a coverage of 98 % is necessary "to gain adequate unassisted comprehension" when reading a fictional text. Either way, Schmitt (2010: 7) states that for a coverage of 95 % 2,000 to 3,000 word families are needed, while 6,000 to 7,000 word families are required for a coverage of 98 %. Nation (2006) found that these 6,000 to 7,000 word families are needed for understanding spoken language, while 8,000 to 9,000 word families are necessary for a coverage of 98 % in written texts. Although researchers propose different numbers concerning vocabulary size, it can be said that several thousand word families seem to be necessary to acquire. Milton (2009: 64) supports this and argues that "[b]uilding a large vocabulary of several thousand words appears to be an absolute condition of being able to function well in a foreign language."

In order to find out what learners really achieve, Milton (2009: 79-82) examines at which rate vocabulary develops in L2 learners of English and how vocabulary size is linked to the language levels defined in the CEFR. He compares two studies involving learners on their

way to B2 and their vocabulary size. One of the schools is located in Greece, while the other one is in Hungary. Over the course of seven years he examined how the learners' vocabulary size developed at a school in Greece and concluded that they added approximately 500 words to their lexicon every year. At the end of these seven years, when they reached B2 and were ready to take the First Certificate of English (FCE) examination, they had acquired 3,500 words on average. Milton (2009) then compares the results with a study conducted by Orosz (2009) who had a look at two schools in Hungary. Here their vocabulary grew at a rate of 300 to 400 words a year between grade 3 (when they started to learn English) and grade 12 (when they took their Maturity examination at the level B2). The learners also reached a vocabulary size of around 3,500 words. Milton (2009: 82) concludes from this data that vocabulary is acquired at regular rates, but also notes that there is variation among individuals.

As can be seen here, vocabulary develops at a regular rate over the course of years and this allows for building a vocabulary size of several thousand words, which should be a good basis for successful communication in English. Now the question remains of how these words are best acquired.

4.2. How is vocabulary acquired?

Let us first consider how acquiring one's mother tongue and a foreign language differ. Schmitt (2000: 18-19), for example, provides an overview. He argues that there are some findings from research on L1 acquisition that can also be applied to L2 acquisition. These include aspects such as the silent period or fixed expressions. Children have a phase where they simply listen and only later they begin to speak. This is called the silent period. Schmitt (2000: 18) suggests that teachers should acknowledge this and give their students time to just listen to the L2. Another finding is that there are so-called chunks in a language. Schmitt (2000: 18) says that it can be expected that there are also chunks in L2 acquisition. He gives the example of beginners who can say "How do you do?", although they are otherwise not able to combine two words in English (Schmitt 2000: 18). This suggests that there are some similarities between acquiring one's native language and a foreign language.

However, L1 and L2 acquisition also differ considerably. According to Schmitt (2000: 19), the main differences are that L2 learners are older, they have already acquired a prior language, their L1, and they are "more cognitively mature". This has an impact on vocabulary acquisition, since L2 learners already know the concepts that words refer to. Often they just have to map new forms, L2 forms, onto the concepts they already know. For example, a learner of English whose L1 is German learns the word *tree*. He or she already knows that

Baum in German refers to a certain type of plant usually found in forests, now only the L2 word form is connected to the already existing concept in the mental lexicon. This is a process of "relabeling" as Schmitt (2000) calls it. Already knowing the concepts and being cognitively more mature are advantages of learning a foreign language in comparison to one's mother tongue. Still, acquiring vocabulary remains a challenging task for foreign language learners.

One of the main and most obvious challenges is that L2 learners do not have access to the same amount of language input. Typically, learners receive several hours of instruction per week. In the case of English, they might be in contact with the language outside the classroom, since English is present in the media. For example, many popular radio stations in Austria play English songs. This is certainly an advantage compared to other foreign languages that are often taught at Austrian schools, such as French or Spanish. Nevertheless, the amount of input still remains rather small compared to a child who is surrounded by the language all the time. Given this drawback, how is vocabulary best acquired in a foreign language setting?

When talking about vocabulary acquisition one can basically distinguish between explicit and implicit learning. Explicit learning involves studying vocabulary explicitly, e.g. using word cards that include L1 translations. Schmitt (2000: 116) defines this type as "focused study of words", whereas incidental learning occurs through exposure to language. One way of incidental learning is through extensive reading (Schmitt 2000: 121). Comparing the two approaches, it can be said that incidental learning is relatively slow. It is necessary to encounter a word around eight to ten times in reading to gain a first understanding of receptive vocabulary knowledge and exposure alone does not necessarily result in being able to use a word productively (Schmitt 2010: 31). Incidental learning appears to be more effective to "enhanc[e] knowledge of words which have already been met" (Schmitt 2010: 31). In contrast to this, learning words explicitly can be quite fast. For example, it has been shown that learning with word cards is effective concerning speed and amount of words that are learned (Nation & Waring 1997: 12). Also Nation (2011: 535) concludes that explicit learning is effective and suggests that various studies indicate "very high rates of learning over relatively short periods of time with good long-term retention."

Although the approaches differ considerably in how fast words can be learned, both incidental and explicit learning are valuable for developing a large vocabulary. There is some consensus among researchers that both approaches are useful (Ellis 1994; Nation 2011; Schmitt 2000, 2010; Sökmen 1997). They can be seen as complementing each other. Nation

(2011: 535), for example, suggests that explicit learning involves "more salient aspects of word knowledge" such as the connection between form and meaning of a word, while implicit learning is more useful concerning "contextual aspects" like how words collocate with others.

Schmitt (2000: 137) proposes that explicit learning is especially useful for highly frequent words, while for words that are less frequent an incidental approach should be applied. Schmitt (2000: 120) further argues that for being able to learn vocabulary incidentally from reading, a "threshold" has to be reached through explicit vocabulary learning, since guessing from context is extremely challenging if a learner does not know a very large proportion of the text. This suggests that spending time on explicit learning is worthwhile especially at the beginning until learners reach a certain vocabulary size that allows for successful incidental learning.

Sökmen (1997) offers an overview of how explicit learning can be supported in the language classroom. She provides the following list:

> build a large sight vocabulary, integrate new words with the old, provide a number of encounters with a word, promote a deep level of processing, facilitate imaging and concreteness, use a variety of techniques, and encourage independent learner strategies (Sökmen 1997: 239)

This suggests that vocabulary acquisition in an explicit way requires developing a large number of sight words and encountering words often. A variety of different activities can facilitate processing words at a deep level and various techniques should allow for integrating new words into the mental lexicon. Words need to be connected to others in the mental lexicon in order to memorize them easily. Additionally, imaging and concreteness are useful for better word retention. Material that includes visuals and that is well-organized facilitates creating verbal and non-verbal representations in the learner's memory (Sökmen 1997: 244). Concerning concreteness, Sökmen (1997: 244) also refers to what is "concrete (psychologically 'real') within the conceptual range of the learners" and argues that establishing a link between words and personal experience assists the progress of learning. Furthermore, Sökmen (1997) highlights the importance of learner strategies. For example, she suggests that learners need to discover strategies that match their learning styles in order to become independent language learners (Sökmen 1997: 256).

Similarly, Nation (2001) argues for the significance of learner strategies. He states that strategies should be learned in order to cope with low frequency words and he gives the following examples of strategies: "guessing from context, using word parts to help remember words, using vocabulary cards and dictionaries" (Nation 2001: 20). Learners are then able to deal with unknown words and have strategies at their disposal that can help store new words

in their mental lexicon. Strategies can be seen as tools that allow learners to become independent and responsible for their own learning.

Learners are likely to encounter a large amount of words that can never be taught in school, since classroom time is limited. Acquiring vocabulary should, thus, rather be seen as a life-long process. Schmitt (2000: 4), for example, claims that compared to grammar "vocabulary continues to be learned throughout one's lifetime", since grammar contains "a limited set of rules, but a person is unlikely to ever run out of words to learn." This is not only true for foreign language learners but also for native speakers. Even native speakers continue to develop their vocabulary after childhood (Richards 1976: 78). Adults, for example, encounter new words when they read or they might learn new words in their professional fields (Richards 1976: 78).

To briefly summarize this, it can be seen that vocabulary acquisition is complex. Various aspects concerning form, meaning and use of a word have to be acquired. In vocabulary acquisition, an explicit and an incidental approach can be distinguished. Both are useful for building a vocabulary that allows for communicating successfully in a foreign language. It has been argued that the most frequent words should receive special attention and should be learned explicitly, while low frequency words can be acquired incidentally through, for example, reading. In order to aid learners in the complex task of acquiring vocabulary, strategies appear to be valuable. These allow learners to guess from context and deal with unknown words. Strategies are also useful due to the fact that they help students to become independent learners and this certainly provides a foundation for the life-long task of vocabulary acquisition.

So far, we have considered some general aspects of vocabulary acquisition. In reality, there are words that are learned easily, while there are others that seem to be more difficult. What is it that makes some words more difficult to learn than others?

4.3. What affects word learnability?

Word learnability is influenced by various factors. Laufer (1997), for example, provides an overview and discusses the following aspects: pronounceability, orthography, word length, morphology (inflectional and derivational complexity), synformy, parts of speech and semantic features. These can be connected to Nation's (2001) list of word knowledge. Pronounceability, orthography, word length and morphology are clearly linked to knowledge of word form. Parts of speech are related to Nation's (2001) category of use, while semantic features refer to knowledge of meaning. Synformy is related to both form and meaning. Apart

from these aspects also frequency affects word learnability. Let us now have a closer look at each of these aspects.

Pronounceability

Pronounceability has an impact on word learnability. Basically, whether a word is difficult to learn or not is determined by the similarity of L1 and L2 forms (Laufer 1997: 142), e.g. familiar phonemes. If phonemes are similar in a learner's L1, it is easier to perceive the correct pronunciation of an L2 word. If, on the other hand, phonemes are different, a learner might experience difficulty in distinguishing between them and this might result in confusing words (Laufer 1997: 142). An example would be the phonemes at the beginning of *think* and *sink*. Learners whose L1 is German might find it difficult to distinguish between the two words.

Apart from individual phonemes, word learnability is also influenced by the position of certain phonemes in a word (Ellis & Beaton 1995: 110). One example is the phoneme /ŋ/. In English this phoneme occurs in a word final but not in a word initial position, whereas in Eskimo it also appears at the beginning of a word (Ellis & Beaton 1995: 110). If phonotactic patterns differ between one's mother tongue and the foreign language one learns, this might affect word learnability and can cause difficulties (Ellis & Beaton 1995: 111). Overall, it can be summarized that the more phonemes and phonotactic patterns differ in both languages, the more difficult are words to learn.

Orthography

Another aspect that influences word learnability is orthography. Similarly to pronounceability, comparability between the native language and the foreign language is a decisive factor. The type of script is one aspect that can complicate word learning (Ellis & Beaton 1995: 115). If a native speaker of German wants to learn Chinese, he or she has to master how to write Chinese characters. This adds a challenge to learning words in a foreign language. In comparison to this, it is easier to learn a language that has the same script as one's native language. German native speakers who learn English can rely on the Roman alphabet.

Even if the script is the same, learners still need to learn about the orthographic patterns, since languages differ in "sequential letter probabilities" (Ellis & Beaton 1995: 116). The degree of orthographic similarity between one's L1 and the L2 influences word learnability

(Ellis & Beaton 1995: 116). If words are similar in orthographic form in both languages, learning is facilitated. In contrast, if spelling conventions differ, it might lead to difficulties.

Another aspect that is related to orthography is concerned with the degree of spelling-sound correspondence. Acquiring orthographical knowledge of an L2 is easier for learners whose L1 shows similarities to the L2's system (Schmitt 2000: 50). If both languages make use of deep orthography, i.e. weak relation between symbols and sounds, as opposed to shallow orthography, i.e. symbols and sounds are closely related, or vice versa, it might be easier for learners to master the L2's orthographic system (Schmitt 2000: 50). This issue does not only refer to the overall system, but also to the word level. Ellis and Beaton (1995: 117) suggest that the higher the degree of correspondence between graphemes and phonemes in an L1 and L2 word, the more easily the word is learned.

Overall, it can be said that the more similar overall spelling conventions as well as individual word forms are, the easier are words learned. If orthography differs between L1 and L2, learners might encounter difficulties.

Word length

Apart from orthography and pronounceablity, Laufer (1997) also discusses word length and how it is related to word learnability. According to Laufer (1997: 144), one would assume that increased word length might raise the level of difficulty of word learning, since "there is more to learn and to remember". However, this assumption has to be treated with caution. Laufer (1997: 145) suggests that long words usually are characterized by having a transparent morphological structure. Words such as *unavailable* can contain several common morphemes and so it should not be difficult to understand or to memorize these long words (Laufer 1997: 145).

Morphology

Although long words can be morphologically transparent, other aspects that are related to morphology can lead to an increased learning burden. If words, for example, have irregular plural forms, learning them is more difficult due to the fact that there are numerous forms to learn (Laufer 1997: 145). One has to learn two word forms such as *mouse* and *mice*. This is more demanding than just memorizing one word form and adding a regular plural suffix. In terms of derivation, it can also be said that the higher the complexity, the higher is the learning burden. Irregularity of how morphemes can be used to express a certain meaning

might lead to difficulty (Laufer 1997: 146). For example, the prefix *over-* can be used in various words, but does not always mean the same. Laufer (1997: 146) gives the example of *overfly* and *overcook*. In the former *over* signifies *across*, while in the latter it implies that something has been cooked for too long. These differences might lead to confusion. Thus, it can be said that inflectional and derivational complexity can have an impact on word difficulty. Not only prefixes can be confused when they are similar in form and only differ in meaning, but even whole words can lead to confusion. This is related to synformy.

Synforms

Synforms are words that are similar in word form (Laufer 1997: 146). These words may have the same stress pattern, the same number of syllables or belong to the same word class (Laufer 1997: 147). Examples are *effect/affect*, *prize/price*, *economic/economical*, or *comprehensible/ comprehensive*. Similarity in form or sound can be confusing for learners (Laufer 1997: 146) and might result in difficulties. Thus, it can be said that synforms might be challenging for learners.

Polysemy and homonymy

Apart from words that are similar in form, there are words that have the same written or spoken form and only differ in meaning, i.e. polysemes and homonyms. Polysemes and homonyms can cause difficulty for learners. It might be problematic to distinguish between the different meanings of a single form (Laufer 1997: 152). It is easier to remember just one meaning for one form. Thus, it can be said that polysemes and homonyms can be difficult for learners.

Form-meaning connection

Another aspect that concerns the semantic level of word learning is the form-meaning connection. Ellis and Beaton (1995: 112) argue that words are easy to learn if there is a "1:1 mapping of meanings represented by the native and foreign words." If the form-meaning connection differs between one's native language and the foreign language, a word is difficult to learn. In line with this, Milton (2009: 38) suggests that difficulties can arise from varying connotations or associations between L1 and L2. Thus, the more similar native and foreign

words are in terms of their concepts and what is associated with a word form, the more easily are words learned.

Concreteness, abstractness and imagability

Additionally, there are several semantic features that can impact word learnability. These include concreteness, abstractness and imagability. Milton (2009: 36) argues that a word such as *philosophy* is more difficult to learn than *table*, since the latter refers to something one can touch or see. Thus, abstract words might be more difficult to learn than concrete and imagable words. In other words, the more imagable a word is, i.e. "degree to which it arouses a mental image", the higher is the likelihood of retention (Ellis & Beaton 1995: 114). Further support for the argument that imagable words are more easily learned can be found in Sökmen (1997). She suggests that imaging and concreteness can facilitate word retention (cf. *4.2. How is vocabulary acquired?*). Therefore, it can be said that concrete and imagable words are more easily learned than abstract words.

Specificity

Still another semantic feature that affects word learnability is specificity. This is closely related to register. According to Laufer (1997: 151), learners acquire general words that are not restricted concerning register more easily than highly specific words that are restricted to a certain context. A possible explanation is that general words appear in a variety of contexts, whereas more specific expressions are more restricted and "require the learner to familiarize himself or herself with extra-linguistic phenomena, such as the socially-defined relationships between individuals in the language community" (Laufer 1997: 151). Learning about register restrictions is, thus, certainly more challenging than just simply using general words. It can be said that more specific words that are subject to register restrictions are more difficult to learn than more general words.

Part of speech

Still another aspect of word learnability is part of speech. Certain parts of speech are easier to learn than others. Nouns are learned easily, adverbs are the most challenging word class, while verbs and adjectives are somewhere in the middle (Schmitt 2000: 60). Milton (2009: 37) supports this argument by saying that nouns can frequently be illustrated by pictures

compared to other word classes such as adverbs. This facilitates retention and allows memorizing nouns more easily as compared to other word classes such as adverbs or adjectives.

Frequency

Apart from the factors discussed by Laufer (1997), there is another point that needs to be mentioned. Frequency also influences word learnability. Higher frequency words are acquired before lower frequency words (Schmitt 2010: 14). Milton (2009: 25) supports this and states that "there is a strong relationship between a word's frequency and the likelihood that a learner will encounter it and learn it." Learners encounter high frequency words more often and acquire them more easily than words they only encounter infrequently.

It can be seen that learning words in a foreign language is a challenging task that involves various aspects of knowledge. These are basically form, meaning and use. On all three levels different factors can influence whether a word is easy or difficult to learn. It can be said that the less regular phonotactic and orthographic patterns are, the less similarity there is between the native language and the foreign language, the more meanings there are for one form, the less imagable and concrete words are, the more register restrictions there are and the less frequent a word is, the more difficult it is to learn. This again highlights the complexity of vocabulary knowledge. Learners need to master various challenges and learn difficult words to become proficient language users. Since the present study focuses on Austrian grade 12 learners of English, let us now consider the goals for them in terms of lexical proficiency. These are specified in the curriculum and the CEFR.

5. Vocabulary in the Common European Framework of Reference (CEFR) and the Austrian curriculum

The Austrian curriculum that specifies the aims concerning foreign languages is based on the CEFR and its proficiency levels. It includes guidelines for the first and second foreign languages students learn. The current curriculum for "lebende Fremdsprachen" (modern foreign languages) stems from 2004. Since the present study focuses on texts written by 12th grade students, only the curriculum for the upper-secondary levels, i.e. grade 9 to 12, will be discussed.

The curriculum (BMBF 2004) defines the overall goals for language learners. These are based on the proficiency levels of the CEFR. For the first foreign language, the curriculum

defines that learners should reach the level B2 in reading, listening, writing, spoken production and spoken interaction after seven or eight years of instruction (BMBF 2004: 6). That would be at the end of grade 12. An example of how these are defined can be seen below. The CEFR describes the level B2 for writing like this:

> I can write clear, detailed text on a wide range of subjects related to my interests. I can write an essay or report, passing on information or giving reasons in support of or against a particular point of view. I can write letters highlighting the personal significance of events and experiences. (Council of Europe 2001: 27)

This description illustrates what the learners can do at the level B2. They can produce texts on a variety of topics involving various text types, such as essays or letters. They can express their opinion clearly and can provide supporting arguments.

Concerning the objectives for the second foreign language, learners are required to reach the level B2 only in reading, while the aims for the other categories, e.g. writing, is to achieve B1 after five or six years of instruction (BMBF 2004: 6). Again, this refers to learners in grade 12 when they graduate from school. It has to be noted here that these levels only form the basis and should be reached by all the learners of a group (BMBF 2004: 5). This means that it is possible for learners to reach a higher proficiency level than is specified in the curriculum. For example, a learner might reach the level C1 in listening after eight years of English instruction, while the curriculum defines B2 as a minimum goal. Furthermore, it has to be considered that once a certain level is reached, all the levels below are seen as prerequisites (BMBF 2004: 5). For example, if learners are at the level B2 in writing, they have also mastered what is specified at the levels A1, A2 and B1 for writing.

Overall, the main goals are rather broad and skill oriented. The learners are required to reach certain proficiency levels in listening, reading, writing, spoken production and spoken interaction. However, the curriculum does not exactly describe the linguistic knowledge that is required for the individual proficiency levels, such as vocabulary knowledge. Still, there is some general information on vocabulary in the curriculum. Vocabulary is considered as part of the linguistic competences. The curriculum specifies that a learner's vocabulary should be expanded in a systematic way and should be placed within a context or situation (BMBF 2004: 3). This seems to highlight the functional aspect of language use. Vocabulary is a means for communicating in a variety of situations and different contexts. In order to be prepared for the possible communicative situations learners might encounter, vocabulary should be increased in a principled way. Furthermore, the curriculum refers to the distinction between reception and production and highlights that a learner's receptive vocabulary knowledge exceeds productive knowledge (BMBF 2004: 3). In addition, the curriculum

suggests motivating learners to increase their vocabulary through reading in the target language outside school (BMBF 2004: 3). This seems to acknowledge the importance of incidental vocabulary learning through an increased exposure to the target language in the form of reading. Here the curriculum mainly refers to vocabulary size. Additionally, complexity and diversity of linguistic devices, also including grammatical aspects, should be increased throughout the upper secondary grades (BMBF 2004: 3).

The more advanced learners get, the more important are also accuracy and appropriateness. This does not only refer to the use of accurate word forms, e.g. correct spelling, but it also concerns appropriateness as part of pragmatic and sociolinguistic competences. The curriculum specifies that pragmatic competences include the ability to use linguistic means for different purposes or functions and that over time the learners should be able to use these means with increased levels of fluency, coherence, clarity, logic and appropriateness (BMBF 2004: 3). Appropriateness is also related to sociolinguistic competences. According to the curriculum, the learners should become more aware of what is socially appropriate and how register differs between, for example, formal, neutral or informal forms of speech (BMBF 2004: 3).

Overall, the Austrian curriculum highlights the importance of a large vocabulary that can be used in a variety of different communicative situations to express various speech functions. With increased language proficiency, the learners should also develop a more complex and diverse lexical repertoire that can be accessed in reception and production. It can also be seen that accuracy of forms as well as an increased awareness of pragmatic and sociolinguistic aspects such as coherence or register are considered essential parts of language development. Nevertheless, the curriculum only offers rather general descriptions of vocabulary knowledge, it does not define clear goals such as how many words a learner is expected to acquire.

Let us now consider the CEFR and how it refers to vocabulary knowledge. The CEFR (Council of Europe 2001) contains a list of competences a learner needs to develop in order to communicate successfully. Among them there is a category labeled communicative language competences including linguistic, sociolinguistic and pragmatic competences (Council of Europe 2001: 108). Within the section of linguistic competences one can find lexical competence. The CEFR (Council of Europe 2001: 110-111) distinguishes between lexical and grammatical elements: Grammatical elements include, for example, personal pronouns or auxiliary verbs. These form part of closed word classes, whereas lexical elements refer to

fixed expressions or single words that belong to open word classes such as nouns or adjectives.

Furthermore, the CEFR (Council of Europe 2001) distinguishes between vocabulary range and control. For the proficiency levels B1 and B2 the aims concerning vocabulary control are the following:

- B1:
  Shows good control of elementary vocabulary but major errors still occur when expressing more complex thoughts or handling unfamiliar topics and situations.
- B2:
  Lexical accuracy is generally high, though some confusion and incorrect word choice does occur without hindering communication.
  (Council of Europe 2001: 112)

Concerning vocabulary control, it can be noted that at B1 errors are still possible when complex ideas are expressed or topics are unfamiliar. At B2, more accuracy is expected. Choosing wrong words might still occur, but at this level it should not lead to misunderstandings. This aspect of increased accuracy is also mentioned in the Austrian curriculum.

The other lexical aspect that is specified in the CEFR is vocabulary range. For the levels B1 and B2 it is defined like this:

- B1:
  Has a sufficient vocabulary to express him/herself with some circumlocutions on most topics pertinent to his/her everyday life such as family, hobbies and interests, work, travel, and current events.
- B2:
  Has a good range of vocabulary for matters connected to his/her field and most general topics. Can vary formulation to avoid frequent repetition, but lexical gaps can still cause hesitation and circumlocution.
  (Council of Europe 2001: 112)

The scale of vocabulary range suggests that learners at B2 have "a good range of vocabulary" and can use a variety of different formulations. The topics can be related to a learner's life and personal experience or might be more general. Learners at B1, however, are only expected to have a large enough vocabulary size for dealing with topics that are familiar to them.

These seem to be rather broad descriptions with some room for interpretation. For example, what does "general topics" refer to? Which words does a learner need to know in order to talk about hobbies or current events? Milton (2009: 174) argues that this is one of the drawbacks of the CEFR. He claims that descriptions such as "familiar word" can vary between contexts and this complicates comparing teaching materials or tests objectively (Milton 2009: 174). He further criticizes that "[i]t is possible for learners with very different

amounts and different kinds of knowledge, including vocabulary knowledge, to be placed within the same CEFR level" (Milton 2009: 174).

Apart from overall lexical competence, the CEFR also includes semantic, phonological and orthographic competence. Semantic competence refers to how words are related to each other, e.g. hyponymy, and how words are related to the context, e.g. connotations (Council of Europe 2001: 115). Phonological competence involves knowing, for example, phonemes or stress patterns (Council of Europe 2001: 116). Also aspects such as spelling and punctuation form part of linguistic competence and are listed as aspects of orthographic competence (Council of Europe 2001: 117).

Additionally, the CEFR defines sociolinguistic competence. This includes, for example, register (Council of Europe 2001: 120). The CEFR also lists knowledge of linguistic markers of social relations (e.g. greetings), politeness conventions, expressions of folk wisdom (e.g. proverbs or idioms) and dialect and accent as part of sociolinguistic competence (Council of Europe 2001: 118-121). These are mainly concerned with appropriateness.

In terms of fluency, the CEFR (Council of Europe 2001: 128) just gives a brief definition and suggests that it "determine[s] the functional success of the learner/user". Fluency is considered as part of functional competence. Thus, the CEFR sees it as an important aspect of language use.

All in all, it can be seen that both the CEFR and the Austrian curriculum contain information on vocabulary knowledge. This information can be placed within the lexical space and its three dimensions. The objectives and competences described in both documents mainly refer to the dimensions of breadth and depth of vocabulary knowledge. For example, both the CEFR and the curriculum refer to range or size of vocabulary. The CEFR specifies that at the levels B1 and B2, learners are expected to have acquired a range of words in order to express themselves concerning familiar topics. The curriculum is not that explicit, but still refers to vocabulary size and quantity and suggests that it should be expanded both in a systematic way and also through reading outside the classroom. This is related to the dimension of breadth. Also depth of vocabulary knowledge can be found in both documents. The curriculum, for example, refers to quality of vocabulary knowledge and addresses issues such as appropriateness or register restrictions. Here again the CEFR offers more detailed information and describes aspects such as semantic competence or sociolinguistic competence. This suggests that both the CEFR and the curriculum address vocabulary knowledge along the dimensions of breadth and depth. Concerning the third dimension, fluency, both documents only refer to it briefly. Fluency is seen as important for

communicating successfully and being able to use language for a variety of different functional purposes.

As can be seen, the objectives concerning lexical knowledge are defined as open and general. Vocabulary knowledge is seen as a means for reaching communicative competence. In order to communicate in different situations, a large vocabulary size and knowledge about its use, e.g. register, is necessary. The question arises of what it means to have a "good range of vocabulary" or a "sufficient vocabulary" as stated in the CEFR (Council of Europe 2001). An answer to this question seems to be especially important for those who grade essays and have to decide whether a learner makes use of a sufficiently varied and broad vocabulary or not. In the present study lexical proficiency is examined in relation to writing in a foreign language. Therefore, the following chapter will focus on writing and explore how it is related to lexical proficiency.

6. Lexical proficiency and writing

So far I have discussed what is involved in knowing a word, how words are acquired in a foreign language and what the objectives are for Austrian grade 12 learners in terms of vocabulary knowledge. Since this study focuses on lexical proficiency in writing, it is also useful to understand how writing works and how writing and vocabulary are related. Therefore, the following aspects should be considered:

- Which processes are involved in writing?
- Which aspects influence writing?
- What is the role of vocabulary in writing?

These questions serve as guiding questions for the present chapter.

6.1. The writing process

In order to understand how writing in both L1 and L2 works, we will now consider which processes are involved and what kind of knowledge is needed for writing. In general, it can be said that the writing process is complex and involves various processes and different types of knowledge and skills. Overall, the act of writing includes three major parts: planning, formulation (or translating) and revising. In different models, terminology may differ, but essentially they refer to the same processes. In this chapter, only one selected cognitive model is described in order to illustrate the writing process.

Flower and Hayes (1981) developed an influential cognitive process theory of writing. They include three basic elements in their model: the writing process, the task environment and the writer's long-term memory. The writing process consists of planning, translating and reviewing. Each of these also contains various sub-processes. In planning "writers form an internal representation of the knowledge that will be used in writing" (Flower & Hayes 1981: 372) and this involves sub-processes such as generating ideas, organizing or setting goals. In the translating process, the writer transforms ideas or a message into language (Flower & Hayes 1981: 373). This is often called formulation in other theories. The third part, reviewing, consists of two sub-processes, evaluating and revising. These can take place anytime during the writing and can even lead to an interruption of other processes (Flower & Hayes 1981: 374). Still another aspect of the writing process is the monitor. The monitor works "as a writing strategist" that decides on moving from process to process (Flower & Hayes 1981: 374).

Each of these processes "may occur at any time in the composing process" (Flower & Hayes 1981: 367). Flower and Hayes (1981: 380) suggest that knowledge, goals and the text work together flexibly during composing. They argue that the writing process can be interrupted by generating ideas or evaluating processes at any time and that also these two processes can be interrupted by "new knowledge and/or some feature of current text" (Flower & Hayes 1981: 380). Thus, it can be said that the writing process is not linear but flexible.

All of these processes can be influenced by the task environment and the writer's long-term memory. The writer's long-term memory contains information about the audience, the topic and even writing plans (Flower & Hayes 1981: 371). The only problem about long-term memory is to find necessary information and to adapt the information to what the writer needs for the task (Flower & Hayes 1981: 371). Apart from long-term memory, the task environment is also influential in writing. It consists of the rhetorical problem and the text produced so far (Flower & Hayes 1981). The rhetorical problem is the starting point for composing. According to Flower and Hayes (1981: 369), an assignment in school can be seen as a simplified rhetorical problem that includes information on the topic, the audience and the role of the student. The writers then try to provide a response or a solution to this problem and they do so by writing a text. However, writers only attend to "problems they define for themselves" (Flower & Hayes 1981: 369). If the problem is not represented in an accurate or not sufficiently developed way, this can lead to leaving out parts of the rhetorical problem (Flower & Hayes 1981: 369).

As the writing continues, another aspect of the task environment comes into play, namely the text that has been produced so far. Flower and Hayes (1981: 371) claim that "each word in the growing text determines and limits the choices of what can come next." This demands a lot of attention and time and thus, competes with retrieving knowledge out of long-term memory and planning how to solve the rhetorical problem (Flower & Hayes 1981: 371).

Throughout the whole process of writing, language users set goals for themselves. Writers create both process and content goals that "guide the writing process" (Flower & Hayes 1981: 377). Process goals typically involve goals about the writing process itself and include "instructions people give themselves", while content goals refer to what the writer intends to say and they usually concern organizational aspects (Flower & Hayes 1981: 377). In general, goals form part of a hierarchical network. According to Flower and Hayes (1981: 378), "new goals operate as a functional part of the more inclusive goals above them." This suggests that goals also contain sub-goals. Sasaki's (2000) findings support this idea of hierarchical organization of goals. It was found that proficient writers use various subordinated goals to reach an overall goal (Sasaki 2000: 280).

In sum, Flower and Hayes' (1981) model characterizes the writing process as flexible, goal-oriented and as having a hierarchical structure of three basic processes (planning, translating, reviewing) and various sub-processes. Apart from the writing process itself, there are other elements that influence the act of writing: the task environment (the rhetorical problem, the text written so far) and long-term memory (e.g. information about the audience or topic knowledge).

In 1996, Hayes revised the model and added some more details to the model presented in 1981. Hayes' (1996) revised model includes even more aspects that influence writing. He acknowledges the important role of working memory, elements concerning the individual writer (e.g. motivation) and the social aspect of writing. Concerning working memory, he highlights its key role in writing and argues that "all of the processes have access to working memory" (Hayes 1996: 8). Also individual factors such as a person's motivation or attitudes influence the writing process. For example, the writing process might be influenced by a "cost-benefit mechanism" (Hayes 1996: 10). Writers choose ways that are less probable to result in errors. Hayes (1996: 5) further refers to the social aspect of writing and acknowledges that writing is a "social activity" and has a "communicative purpose."

The social aspect is also addressed by Widdowson (1983). Widdowson suggests that writing is a "communicative activity" (1983: 34) and that "written discourse too represents an interactive process of negotiation" (1983: 39). In this interaction the writer must assume the

roles of both the writer and the reader (Widdowson 1983: 39). Perl (1980: 368) also refers to this double role of the writer and claims that "writers need to draw on their capacity to move away from their own words, to decenter from the page, and to project themselves into the role of the reader". This mainly is due to the fact that compared to spoken interaction the reader is not present at the moment of writing und thus, the writer has to assume his or her position. Schoonen et al. (2009: 81) further argue that lacking context and feedback requires the writers to be more explicit than in speaking. In spoken interaction, an interlocutor is present and can give immediate feedback, while in written communication, the writer has to estimate and assume whether the reader follows the text and understands it. This highlights that the concept of the reader is complex.

There is still another aspect that adds to this complexity. A text can be read by a single person or by many, it can be addressed to real or only imagined readers (Silva & Matsuda 2002: 254). Sometimes, when we write a text, we do not exactly know who will read it and make assumptions about the audience. Thus, we deal with an imagined audience. Hyland (2003: 49) claims that more proficient writers "are better able to imagine how their readers will respond to their texts".

As can be seen so far, writing is complex. It involves three major processes (planning, translating or formulation, revision) and various sub-processes (e.g. generating ideas). These can occur at any time and can be used flexibly. The flexible characteristic of writing is further highlighted by the different factors that influence the writing process, such as long-term memory or task environment. Also the social aspect of writing influences decisions made by the writer throughout the act of writing. A message has to be carefully crafted keeping in mind the audience, whether real or only imagined, and the purpose of writing. During the whole process of producing a text, the writers set goals for themselves and they try to respond to a so-called rhetorical problem. The result of this complex process is a written text.

So far, we have seen that there are various aspects that are involved in writing, let us now consider the level of formulation in more detail.

6.2. The formulation process

The importance and complexity of formulation becomes clear when we consider how much time writers both in L1 and L2 writing spend on formulation. Roca, Marín and Murphy (2001: 518) found that formulation plays a "highly dominant role" in the writing process. L1 and L2 writers spend considerable time on formulation. In Roca, Marín and Murphy's (2001: 518) study both native speakers and foreign language learners dedicated about 70 % of the time

spent on the overall writing process to formulating processes. Many researchers agree that formulation or translating is a demanding task. Flower and Hayes (1981: 373), for example, state that "[t]he process of translating requires the writer to juggle all the special demands of written English". Similarly, Schoonen et al. (2009: 80) suggest that the formulating process involves a considerable repertoire of linguistic knowledge.

Schoonen et al. (2009: 79-80) provide an overview of how the formulation process works and the various aspects of linguistic knowledge that are involved. They suggest that "propositions in the preverbal message" activate a process of finding adequate lexical forms (Schoonen et al. 2009: 79). These are selected based on morphosyntactic, grammatical and also stylistic or rhetorical decisions. After selecting appropriate forms, the writer encodes the message grammatically and orthographically, i.e. decides on the correct spelling (Schoonen et al. 2009: 79-80). Then the graphemic representations trigger "motor-muscular actions" such as moving a pen or typing on a keyboard, which leads to the final product, the text (Schoonen et al. 2009: 80). This provides a brief description of what is involved in formulation. There are, however, also several sub-processes such as deciding on a certain word form.

Zimmermann (2000), for example, explores sub-processes that are related to lexical retrieval and gives an overview of how word forms are selected:

1. Tentative forms are evaluated and then accepted.
2. Most of the time there is just a single tentative form that undergoes slight modification and/or repetition and only then it is accepted.
3. In many cases evaluation leads to forms being rejected, in some cases these are simplified or postponed.
4. A tentative form that is simplified is accepted in spite of deficiencies, while rejection results in the appearance of new tentative forms.
5. An L2 tentative formulation may start with tentative formulation in the L1, then the problems in the L2 may be stated and strategies may be activated.

   (Zimmermann 2000: 87)

These findings propose that tentative forms can be accepted or changed slightly. Sometimes they are simplified or modified. They can also be completely rejected. In this case an alternative has to be found. For L2 writers it is even possible to rely on their L1 and use it to find an adequate form in the L2. This suggests that finding appropriate word forms is a complex process.

Ideally, the writer should be able to access linguistic knowledge easily (Schoonen et al. 2009: 80). This is the reason why retrieval processes and access to linguistic structures and

forms need to be automatized. Widdowson (1983: 46) claims that "[e]ffective communication commonly requires the unconscious manipulation of linguistic rules." Schoonen et al. (2003: 169) further argue that automatic grammatical and lexical retrieval allows writers to use their available cognitive capacity efficiently. If retrieval processes are not fluent, this can affect the quality and fluency of writing (Schoonen et al. 2003: 171). Lexical and grammatical retrieval processes can take up a writers' mental capacity and leave no room for "higher-level or strategic aspects of writing", e.g. organizing the content or paying attention to the reader (Schoonen et al. 2003: 171). In the case of L2 writing, this can even impede accessing metacognitive or discourse knowledge that language learners have readily available when writing in their native language (Schoonen et al. 2003: 171). Thus, being able to access linguistic information fluently is important for successful writing.

6.3. Importance of lexical retrieval and vocabulary in writing

Lexical retrieval plays an important role in L1 and L2 writing. Manchón, Murphy and Roca (2007: 150), for example, argue that lexical retrieval is necessary for efficiency and fluency in both L1 and L2 written as well as spoken communication. Furthermore, they suggest that lexical retrieval is fundamental in all three major elements of the writing process: planning, formulation and revision (Manchón, Murphy & Roca 2007: 150). In the planning process, writers do not only attend to planning globally, but they also plan more specifically and decide on words or sentences (Manchón, Murphy & Roca 2007: 150). In formulation, ideas are then converted into language and this requires writers to "have a certain degree of automatic control over their linguistic resources, which includes (automatic) lexical access" (Manchón, Murphy & Roca 2007: 151). Even in revision, the language level and lexical retrieval seem to be important. Manchón, Murphy and Roca (2007: 152) refer, for example, to Whalen and Ménard (1995) who found that most revision takes place at the language level and that the focus lies on the level of words.

The importance of lexical retrieval processes in writing can also be supported by the overall perception of vocabulary as being important for successful writing. Folse (2008: 4), for example, states that vocabulary is crucial for writing successfully. One reason he suggests is that lexical errors in comparison to grammatical ones result in problems that are more global, since they might lead the reader "to use meaning obtained from incorrect vocabulary to decipher subsequent unclear words" (Folse 2008: 4). Readers might misunderstand the meaning of a word. If there are further words that are not clear, the reader might rely on the incorrect meaning of the former word in order to figure out the meaning of the other unclear

words. This might result in misunderstandings. Thus, lexical errors might impede successful communication. Lexical errors can even be considered as "disruptive" (Gass 2008: 450-451). Furthermore, Folse (2008: 4) argues that vocabulary influences how readers perceive the quality of a text and that using simple words might result in ideas to appear simple. This notion is also supported by Nation (2008). Nation (2008: 83) states that lexical richness and quality of writing are related.

As can be seen, lexical aspects form an essential part of writing, both in the writing process itself and also in the readers' perception of text quality. Let us now consider what research tells us about the relation between lexical proficiency and writing.

7. Research on lexical proficiency and writing

Research on lexical proficiency has received increased interest in the last few years. In terms of productive vocabulary use in writing and speaking several measures were developed. These can be distinguished between measures that work with tagging and those that are related to lexical richness.

7.1. Lexical richness

Lexical richness consists of three main measures: lexical density, lexical diversity (or sometimes called lexical variation) and lexical sophistication (Daller, Milton & Treffers-Daller 2007: 13). Lexical density measures the proportion of function and content words in a text (Daller, Milton & Treffers-Daller 2007: 13). It is calculated by dividing the number of content words by the total number of words (Read 2000: 203). The more content words appear in a text, the higher is lexical density. This measure was originally developed by Ure (1971). Ure (1971) found that more than 40 % of a written text consists of content words, while in spoken language lexical density is lower than 40 %. In terms of lexical proficiency, however, this measure does not seem to be conclusive. Wolfe-Quintero, Inagaki and Kim (1998: 112) criticize that it is not clear how lexical density is related to lexical development, since "beginning learners might use fewer grammatical words than higher level learners or native speakers, resulting in a higher ratio for the lowest developmental levels, but little difference at higher levels."

This is also confirmed by Engber (1995) who investigated lexical density in relation to proficiency. Apart from lexical density, Engber (1995) also examined lexical variation and lexical errors. The participants were at intermediate and high-intermediate levels. Their essays

were holistically scored and then compared to the measures of lexical richness. Lexical density did not correlate significantly with essay quality, whereas lexical variation in combination with the percentage of lexical errors significantly accounted for high holistic scores. Thus, Engber (1995: 150) concluded that "the readers gave higher scores to writers who were able to use a variety of lexical resources correctly." This suggests that a combination of accuracy and lexical diversity seems to be an indicator of competence as measured by human ratings. Thus, lexical variation appears to be a better indicator of lexical proficiency than lexical density.

Lexical variation or lexical diversity is basically measured by calculating the type-token ratio (TTR) (Daller, Milton & Trefers-Daller 2007: 13). This indicates how many different words, i.e. types, occur in a text compared to the total number of running words, i.e. tokens. In terms of lexical proficiency, this means that learners who can use a variety of different words are more proficient than learners who produce texts with a lower TTR (Milton 2009: 126). It is assumed that more advanced learners can use more varied words, since they have "a large vocabulary that can be activated and used" as opposed to those learners whose vocabulary is limited and cannot be activated (Milton 2009: 126). Thus, it can be said that the higher the TTR, the more lexically proficient a learner is.

Unfortunately, the TTR has been criticized due to its variability when texts of different length are compared, because with increasing text length the likelihood of new words decreases (Read 2000: 201-202). One way to deal with this issue is to compare texts that have the same text length (Nation 2007: 42). Researchers also developed new measures to address this issue. One of these is Malvern and Richards' (1997) D. This is sometimes also referred to as VOCD, since the program CLAN uses the VOCD command to calculate D (Treffers-Daller 2013: 81). The measure D has been shown to be a useful indicator of lexical diversity (Jarvis 2002: 71). In addition, Tidball and Treffers-Daller (2007), Daller and Xue (2007) and Treffers-Daller (2013) found that the measure D can distinguish between proficiency levels.

Daller and Xue (2007), for example, investigated EFL students of Chinese origin and their oral proficiency. They compared various measures of lexical diversity and concluded that D can distinguish between proficiency levels. Two other studies that show similar results were conducted by Tidball and Treffers-Daller (2007) and Treffers-Daller (2013). Although they focus on learners of French, they show that the measure D indicates differences between learners with varying degrees of language proficiency. Tidball and Treffers-Daller (2007) examined measures of lexical diversity in oral speech. They compared three groups: a native speaker group and two groups of non-native speakers with different language levels. The non-

native speakers were students at a British university who majored in French. The results show that the three groups differ in scores of D. The lower proficiency non-native group has the lowest score, while those learners with higher proficiency show comparatively higher scores of D. The highest score is reached by the native speaker group. Similarly, Treffers-Daller (2013) compared two groups of undergraduates studying French at different proficiency levels and a group of native speakers. She also found that scores of D can account for variance between the three groups in terms of lexical diversity in spoken language. Thus, it can be said that the lexical diversity measure D can indicate differences in proficiency.

The third measure that is associated with lexical richness is lexical sophistication. It investigates the use of low frequency words. Among other methods, the Lexical Frequency Profile (LFP; Laufer & Nation 1995) is useful for measuring lexical sophistication. It provides a profile that gives an overview of how many percent of the total number of words fall into the categories of the first 1,000 most frequent words, the second 1,000 most frequent words, the University Word List (UWL) that includes academic vocabulary and a category of words that do not belong to any of the previously mentioned lists. The LFP allows to distinguish between the percentage of high and low frequency words in a text and thus, can indicate how lexically sophisticated a text is. Nation (2007: 42) suggests that "the more vocabulary a text has from outside the higher frequency levels, the greater the lexical richness rating."

This is also related to lexical proficiency. It can be said that the more infrequent words a learner knows, the higher is lexical proficiency. Laufer and Nation (1995) even claim that the LFP can distinguish between proficiency levels. The underlying assumption that the use of low frequency words is related to a learner's lexical proficiency level is supported by Daller, Turlik and Weir (2013: 193), since they claim the following:

> At the beginning, learners acquire more general basic words that can be useful in a wide range of contexts. Later in the process, more specific infrequent words are acquired which do not contribute towards an increase in proficiency in the same way as the basic words.

This provides a clear overview of the importance of frequency as well as the aspects of specificity and register in various contexts. As learners develop their vocabulary, they move from basic words that appear frequently to more specific words that are more infrequent. With more time spent on learning the L2, also exposure to L2 increases and learners are more likely to come across a variety of lower frequency words. This seems to suggest that the LFP is useful for examining differences between lexical proficiency levels.

Let us now have a look at two selected studies that investigate lexical richness in writing. Laufer and Nation (1995), who developed the LFP, examined texts written by

65 learners of English as a foreign language. The learners came from various L1 backgrounds, e.g. Chinese or Russian. The results show that the LFP is able to distinguish between learners at three different levels of proficiency. The less proficient learners use more frequent words than the other two groups, whereas the most proficient group uses the smallest number of the 1,000 most frequent words. For the second 1,000 most frequent words no significant differences are found between the groups. The categories of sophisticated vocabulary, i.e. UWL and Off-List, again show significant differences: The more proficient the groups, the higher are the percentages of words that are used from these categories. Thus, it can be seen that the LFP distinguishes between different proficiency levels. The higher the level, the more infrequent words (UWL and Off-List) and the less frequent words are used.

Horst and Collins (2006) also used the LFP to analyze learner texts. They investigated the development of ESL learners in Quebec whose L1 was French. The participants were asked to write narrative texts after roughly 100, 200, 300 and 400 hours of instruction. The texts were analyzed by means of Cobb's Vocabprofile program. It has to be noted that Vocabprofile uses slightly different data concerning academic vocabulary. The original University Word List (UWL) used by Laufer and Nation (1995) is replaced by Coxhead's (2000) Academic Word List (AWL). Horst and Collins (2006) found that overall the learners showed profiles that include a large proportion of high frequency words. Additionally, they discovered that the learners did not use an increased number of low frequency words after 400 hours of ESL instruction. This is contrary to what they expected. In order to gain a more detailed picture, they examined the development within the category of the 1,000 most frequent words and discovered that the learners made use of more word families and within these word families they "produced a wider range of inflected and derived forms" (Horst & Collins 2006: 101). This suggests that working with the LFP also requires having a closer look at the individual categories and which words or word families they contain. In general, this study also shows that the LFP is a useful research tool. One just has to focus on the details as well as the overall categories.

It can be seen that some lexical richness measures allow determining lexical proficiency. Among them are lexical diversity and lexical sophistication as measured by the LFP. The more varied and the more low frequency words a learner uses, the higher is lexical proficiency. Apart from lexical richness measures, there is a variety of other indices that can be used for analyzing lexical characteristics of texts. One common approach is to use tagging programs.

7.2. Tagging programs

Several researchers aimed at investigating lexical features by tagging. One well-known researcher who works with tagging is Biber. Biber (1988), for example, investigated how speech and writing vary from each other. He developed a tagger that became known as Biber tagger. This tagger is used in various studies and this approach was also adopted for other research purposes. Ferris (1994), for example, followed Biber's (1988) approach of analyzing various syntactic and lexical features. She investigated the features in relation to ESL writing at different proficiency levels. She discovered that more advanced learners used more conjuncts, more emphatics and more varied cohesive devices. Ferris (1994) also included various grammatical and syntactic features. She found, for example, an increased use of passives, prepositions, nominalizations as well as more complex syntactic features such as relative clauses or participal constructions.

Similarly, Grant and Ginther (2000) analyzed both lexical and grammatical features of L2 learner texts at three different levels. Their results suggest that the higher the proficiency level, the more the learners use emphatics, amplifiers, demonstratives, downtowners and conjuncts. A higher number of conjuncts are used in order to produce better connected texts. Similarly, the use of demonstratives increases and these affect cohesion. Another aspect that increases is related to expressing certainty. As learners become more advanced, they use more emphatics and amplifiers. Furthermore, Grant and Ginther (2000) discovered an increased type-token ratio as well as an increased average word length.

A more recent approach to tagging linguistic features in texts involves the program Coh-Metrix. It was originally designed for investigating cohesion (Graesser, McNamara & Kulikowich 2011: 224). Coh-Metrix provides a number of linguistic measures. These include indices that are related to cohesion, e.g. referential cohesion or connectives, as well as more general descriptive indices, e.g. word length or text length, and syntactic complexity measures. Additionally, there are some indices that are related to vocabulary. Coh-Metrix provides information on lexical diversity, e.g. TTR and VOCD, frequency based on the CELEX database (Baayen, Piepenbrock & Gulikers 1995), part of speech and categories that are based on psychological ratings taken from the MRC Psycholinguistic Database (Coltheart 1981). This database contains linguistic and psycholinguistic information (cf. Coltheart 1981). The psycholinguistic information was obtained by means of word association tests and tests that asked people about what a certain word evokes (Coltheart 1981). Coh-Metrix uses this information and includes, for example, the categories of familiarity, concreteness, imagability and meaningfulness. Familiarity indicates the degree of familiarity an adult associates with a

certain content word. Low ratings reflect that one has never seen a word before, while high ratings indicate that a word is encountered frequently. A high familiarity score in Coh-Metrix, thus, shows that words are frequently encountered and are familiar. Concreteness is also based on psychological ratings. Concrete words are usually related to the human senses of seeing, hearing, touching and tasting. The higher the score, the more concrete are words. Similarly, the index of imagability is based on the MRC database. This aspect refers to mental images. The higher this score, the more easily are mental images called to mind. Another category that is based on human ratings is meaningfulness. Meaningfulness refers to word associations and how closely a certain content word is related to other words. The higher this value, the more associated a word is with others.

Two other lexical indices are polysemy and hypernymy. They are based on information from WordNet (Fellbaum 1998). In terms of polysemy, WordNet identifies various senses of content words and Coh-Metrix uses these to calculate an average value of polysemy. The higher the value, the more polysemous words are in a text. Concerning hypernymy, WordNet includes hierarchical scales. It measures how many words are subordinated and superordinated to a certain word. This is reflected in Coh-Metrix. The higher the value of hypernymy, the more specific are the words. The program includes three hypernymy indices: for verbs, for nouns and for both verbs and nouns. All in all, this program offers a variety of indices that can be used for different research purposes. Let us now consider some studies that used Coh-Metrix.

Since the original purpose of Coh-Metrix was to examine cohesion, Crossley and McNamara (2009) focused on this aspect and compared texts produced by L1 and L2 writers. They found that L2 writers use cohesive devices differently. L2 texts show less lexical overlap, less causal and spatial cohesion. In addition, they examined lexical features. They found that L2 writers are lexically less proficient and that L1 and L2 texts differ in various aspects. L2 writers, for example, use less abstract words, more frequent words and words whose age of acquisition score is higher. In sum, Crossley and McNamara (2009: 132) claim that their findings show crucial differences between L1 and L2.

More attention has been given to the lexicon and its relation to writing quality in the last few years. McNamara, Crossley and McCarthy (2010), for example, investigated the relation between linguistic features and writing quality in argumentative essays written by native speakers of English. They used Coh-Metrix and included a total number of 53 indices. Their results suggest that syntactic complexity, lexical diversity and word frequency based on the CELEX database correlate with essay scores. They conclude that “higher scored essays were

more likely to contain linguistic features associated with text difficulty and sophisticated language" (McNamara, Crossley & McCarthy 2010: 73).

McNamara, Crossley and McCarthy (2010) included a variety of linguistic features and examined their relation to overall writing quality. Later studies mainly focused on lexical characteristics and how these are related to holistic scores. Crossley et al. (2010) aimed at developing a model for predicting lexical proficiency in L2 learner texts. They also used Coh-Metrix and included the following features in their analysis: lexical diversity, lexical frequency, meaningfulness, concreteness, familiarity, imagability, hypernymy and polysemy. The results show that there are three indices that account for 44 % of the variance of the holistic scores of lexical proficiency that the texts received (Crossley et al. 2010: 572). These indices are lexical diversity (D), hypernymy and frequency based on CELEX. They found that lexically more proficient writers use words that are more varied, less specific and less frequent. Crossley et al. (2010: 574) further suggest that those features that did not show high correlations to lexical proficiency are also of interest, since they are related to accessing words in the mental lexicon. They still provide some information on lexical proficiency:

> These indices demonstrated that writing samples scored as more lexically proficient contained less meaningful words, less familiar words, less imagable words, less concrete words, and less semantic co-referentiality. In general, these correlations support the notion that more lexically proficient writers use more sophisticated words that are more abstract, less familiar, less imagable, and have fewer semantic associations with other words. (Crossley et al. 2010: 574)

This suggests that also the indices of meaningfulness, familiarity, imagability and concreteness are related to lexical proficiency. In further research, these findings were confirmed.

Crossley et al. (2011) analyzed lexical proficiency in oral speech of L2 learners. They compared human ratings of lexical proficiency to lexical features. They found that the indices of D (lexical diversity), hypernymy, imagability and familiarity are most predictive of lexical proficiency scores assigned by human raters (Crossley et al. 2011: 190). The findings suggest that more proficient learners use a variety of words and these are less imagable, less familiar and less specific. This confirms the findings of Crossley et al. (2010). It has to be noted here that the studies differ in terms of data: Crossley et al. (2011) examined spoken language, while Crossley et al. (2010) used written texts. Nevertheless, they both provide useful information on lexical proficiency. This even seems to confirm that several Coh-Metrix indices are predictive of lexical proficiency irrespective of mode of expression.

In 2011, Crossley, Salsbury and McNamara again investigated lexical proficiency in learner texts. This time they compared texts written by L2 learners of English at various

proficiency levels. Proficiency levels were based on the learners' test scores on the ACT ESL Compass reading test, the TOEFL (Test of English as a Foreign Language) paper-based and internet-based test. For the analysis, Coh-Metrix was used and indices were included that are related to breadth and depth of vocabulary knowledge and to how accessible core lexical items are. The aim of this study was to identify features that allow for distinguishing between proficiency levels. The results suggest that there are several lexical indices that can predict an L2 learner's level and these are: imagability, lexical diversity and familiarity. More advanced learners use words that are less imagable and familiar. Overall, they use more diverse words. Again these features seem to be significant indicators of lexical proficiency.

As can be seen, there are various studies that focus on lexical proficiency. Two basic lines of research can be distinguished: Those studies that work with lexical richness and those that use tagging programs such as Coh-Metrix. Both aim at investigating lexical proficiency. It can be concluded that lexical proficiency depends on a variety of features, such as frequency, familiarity, imagability, and lexical diversity. These features can be placed within the lexical space. In terms of breadth of knowledge, lexical diversity and frequency indicate lexical proficiency. The more varied and the less frequent words are used, the more proficient a learner is. Concerning depth of knowledge, there are three aspects: hypernymy, polysemy and meaningfulness. Learners who are more proficient use less specific and less meaningful words, but show a higher degree of polysemy. Also indices that are related to accessing lexical items in the mental lexicon or fluency can determine lexical proficiency. These are concreteness, familiarity and imagability. Learners at a higher lexical proficiency level use less concrete, less familiar and less imagable words.

Some of these findings can also be compared to what has been discussed concerning word learnability. It can be assumed that the more advanced learners are, the more difficult words they will learn. This is why some of the factors that have an impact on word difficulty were also found to be indicators of a higher proficiency level. For example, less concrete, less imagable and less frequent words are more difficult to learn. These aspects are also found to indicate lexical proficiency in various studies. Also polysemy is related to word difficulty. If one word form has several different meanings, it is more difficult to learn. In studies that used Coh-Metrix higher scores of polysemy indicate a higher level of lexical proficiency. Thus, it can be said that several factors that are associated with difficulty also correspond with what has been found to determine lexical proficiency. Interestingly, there is one aspect that differs between the studies on lexical proficiency and research on word learnability. It is assumed that words that are more specific are more difficult to learn. It has been found, however, that

more specific words are associated with less lexical proficiency. This suggests that not all aspects of word learnability are related to lexical proficiency, but it can certainly be said that most of them overlap.

It can be summarized that various factors influence lexical proficiency. More proficient learners are characterized by using less imagable, less concrete, less familiar, less specific, less meaningful and less frequent words, whereas they show a higher degree of polysemy and a greater variety of different words. These aspects will be explored in relation to learner texts in the next chapters.

8. Design of the empirical study

This study aims at investigating lexical proficiency and writing in a foreign language. Learner texts from two groups are compared. Both groups consist of grade 12 learners who attended the same school, an upper-secondary school in central Vienna, Austria. Their native language is German. The only difference is that one group learned English as their first foreign language (L2) and received eight years of instruction, while the other group learned it as the second foreign language (L3) and only had six years of English. The main research question is how these two groups differ in lexical proficiency. For this purpose the following research questions are considered:

- What are the differences in terms of lexical proficiency between the two groups?
- What are lexical characteristics of Austrian grade 12 learner texts written by students who learn English as an L2 or an L3?

In order to answer these questions, a combined approach is followed. Lexical richness measures and Coh-Metrix measures that are related to lexical proficiency are used in this study. The aim is to gain a detailed picture of how lexically proficient Austrian grade 12 learners are and how groups with six and eight years of English instruction differ from each other.

8.1. Subjects

In three consecutive years, 2008 to 2010, 12th grade students of an upper-secondary school in central Vienna were asked to take part in a test. All in all, 140 students participated. Of these 95 were taught English for eight years, while the other 45 only received six years of English instruction. Both groups also learned French. For the first group, French was their L3 and they received six years of instruction, whereas the second group started with French before

English. The second group had French for eight years all through lower and upper secondary. To illustrate it more clearly, here is an overview:

- group 1:
  English (L2): 8 years
  French (L3): 6 years
- group 2:
  French (L2): 8 years
  English (L3): 6 years

According to the curriculum (BMBF 2004), these two groups should be at different levels in writing. Group 1 should be at least at the level B2, while the requirement for group 2 is to reach at least B1 (cf. BMBF 2004). Both groups were asked to write two texts as part of a larger test. The test also included reading and listening tasks. For the present study only the two writing tasks are relevant. All the data stems from the Database of English Learner Texts (DELT).

8.2. Data

The learners were asked to write two texts, an argumentative essay and a letter. For more detailed information see the task descriptions in Appendix 1. The argumentative essay required the students to give their opinion on tuition fees at universities. This topic was a matter of public discussion at the time when the essays were collected (2008 to 2010). The students were asked to write between 250 and 300 words. They received a general task description (cf. Appendix 1) and one text that served as input (cf. Appendix 2). This text was already part of a reading task.

The second writing task consisted of a letter to an old friend. The students should write between 150 and 200 words. The task description (cf. Appendix 1) and an additional text (cf. Appendix 3) that also formed part of a reading task provided information on the expected content of the letter. The students were asked to explain that they have met a former school mate who used to be a bully and now is in a wheelchair. The input for this task aimed at providing a context and a sense of audience for the learners. As has been mentioned before (cf. *6.1. The writing process*), writing is a communicative act embedded in a context. In real life people know the person who is addressed. This is why information on the receiver of the letter, i.e. a former class mate, was also provided in the task description.

For the purpose of analysis, the transcripts of the learner texts taken from the DELT database had to be prepared for the two programs that were used for the analysis, Cobb's Vocabprofile and McNamara et al.'s (2005) Coh-Metrix. First, the texts were cut to equal length in order to secure comparability. The argumentative essays were cut to the first 220 tokens. Unfortunately, some students did not write 250 or more words as specified in the task descriptions and thus, 220 tokens was selected as a cut-off point. Concerning the letter, a length of 150 tokens was considered the best length to allow as many texts as possible to form part of the analysis. Those texts that did not include a minimum of 150 tokens (letter) or 220 tokens (argumentative essay) were excluded from the data. From those texts that were long enough, only the first 150 tokens in case of the letter and the first 220 tokens from the argumentative essay formed part of the analysis.

In the next step, a comparable number of texts from group 1 and group 2 were selected. After considering the issue of text length, 33 learners of group 2 were left. To compare the two groups reliably, an equal number of texts was selected from group 1. These were chosen by considering the factor of overall text length. A mixture of texts with varying text lengths was selected in order to cover the spectrum of different learner texts. This left a total number of 66 participants. The numbers vary slightly from year to year. Here is an overview of the participants per year (Table 2):

Table 2: Number of participants per group and year

	group 1	**group 2**
2008	10	10
2009	10	10
2010	13	13

In 2008 and 2009 there were 10 students per group, while in 2010 the number of participants was 13. All the students together wrote a total number of 66 argumentative essays and 66 letters.

After selecting the texts and cutting them to equal length, the texts were prepared for the analysis programs. Several factors had to be considered in order to secure that the programs could process and analyze the learner texts. One aspect was incorrect spelling. Although it is acknowledged that orthographic knowledge is an important aspect of vocabulary knowledge, accuracy is not the main focus here. This would go beyond the scope of the current study. Therefore, a decision was made to correct spelling mistakes when they resulted in word forms the analysis tools would not recognize, e.g. *tuiton* instead of *tuition*. Incorrect use of spaces between words was also corrected in the cases where it led to unrecognizable word forms,

e.g. *eachother* was changed to *each other*. Similarly, grammar mistakes were corrected when they affected word form and spelling as a result of, for example, using an incorrect irregular verb form (e.g. *payed*) or incorrect plural formation (e.g. *problemes*). These were corrected and treated as spelling mistakes, since grammatical knowledge was not in the focus of the study.

Apart from these spelling instances, there were other word forms that the analysis tools could not identify. These were labeled coinages, because they do not exist in English but nevertheless were used by the learners. Some of these words are L1 transfers, e.g. *sympathic* (German: *sympathisch*), inventions such as *malperformance* or a mixture of two existing forms, e.g. *except* and *acceptable* were combined to *exceptable*. It was also decided to count words with wrong prefixes and suffixes, e.g. *ineducated*, as part of this category. All these examples were marked as coinages.

Another issue that arose was how to handle proper nouns and numbers. Daller, Milton and Treffers-Daller (2007: 2-3) argue that "often, numbers, proper nouns and names, and false starts and mistakes are excluded from word counts." Nevertheless, it was decided to leave proper nouns and numbers in the texts. The reason for this was that the texts should resemble their original version with as few changes as possible.

Additionally, some decisions concerning the individual programs had to be made. For Vocabprofile it was decided to create an extra category besides the first and second 1,000 most frequent words, the AWL and the Off-List. The program allows creating a so-called User List or also Technical List. In the present study it includes place names and proper names, as well as coinages and those words that were marked as unclear in the transcripts. Unclear expressions are probably the result of unreadable hand writing in the original learner texts. All in all, the User List has the purpose of separating data that would influence the frequency distribution among categories in a negative way. These words would fall into the category of Off-List and would thus, be treated as low frequency words. However, we are primarily interested in low frequency content and function words that the learners know. By using an extra list it was possible to leave this data in the analysis without it affecting the frequency measures. Once these decisions were made and the texts were prepared, the data was examined in terms of lexical proficiency.

8.3. Data analysis

For the purpose of determining how lexically proficient learners of English as L2 and L3 are, it was decided to use both Coh-Metrix (McNamara et al. 2005) and Cobb's Vocabprofile. This should provide a detailed picture of lexical proficiency. A combined approach of lexical richness measures and measures that are related to vocabulary knowledge are considered as complementing each other. Vocabprofile offers various measures that are related to lexical richness. It calculates, for example, the basic TTR, lexical density and provides information on the frequency profile of a text. Since the TTR has been criticized and lexical density does not seem to indicate lexical proficiency, only the frequency profile associated with lexical sophistication is included in the present study. In addition, several measures from Coh-Metrix also form part of the analysis: lexical diversity (VOCD), hypernymy, polysemy, meaningfulness, concreteness, familiarity and imagability. These measures were selected, since they are associated with vocabulary knowledge and several studies found that they can distinguish between proficiency levels (cf. *7.2. Tagging programs*). Here is an overview of the selected measures and how they can be combined with the lexical space:

- breadth of vocabulary knowledge:
    - lexical diversity: VOCD (Coh-Metrix)
    - lexical sophistication: frequency profile (Vocabprofile)
- depth of vocabulary knowledge:
    - hypernymy (Coh-Metrix)
    - polysemy (Coh-Metrix)
    - meaningfulness (Coh-Metrix)
- accessing core lexical items:
    - concreteness (Coh-Metrix)
    - familiarity (Coh-Metrix)
    - imagability (Coh-Metrix)

This categorization is based on the framework Crossley, Salsbury and McNamara (2011) used in their study on lexical proficiency, except that the frequency profile is added as a breadth of vocabulary knowledge measure. It is assumed that these measures can distinguish between proficiency levels and thus, they are used for comparing two groups who learned English as L2 and L3. The aim is to investigate if there are differences in lexical proficiency and how exactly the groups differ from each other.

9. Findings

The results will be presented according to the framework of the lexical space as can be seen above. First, the results for the argumentative essays will be discussed and then the results concerning the letters will be presented.

9.1. Analysis of argumentative essay

9.1.1. Breadth of vocabulary knowledge

Lexical diversity (VOCD)

Lexical diversity indicates how many different words, i.e. types, a learner uses. It is suggested that the more lexically diverse a text is, the higher is lexical richness and the higher is also lexical proficiency (cf. *7.1.Lexical richness*). How lexically diverse the argumentative essays are can be seen in table 3.

Table 3: Lexical diversity (argumentative essay)

	group 1	group 2
2008	83.887	92.928
SD	17.853	18.586
2009	85.914	79.825
SD	16.542	15.759
2010	89.359	82.623
SD	13.568	14.599
mean	86.657	84.898
SD	15.530	16.650

The figures show some differences between the groups. In 2008 group 2 uses more varied words than group 1, whereas in 2009 and 2010 the score of lexical diversity is higher in group 1's argumentative essays. Overall, the mean values indicate that group 1 shows a slightly higher degree of lexical diversity (86.657) as compared to group 2 (84.898). This suggests that the students who learned English for eight years make use of marginally more varied words in their texts than learners who only received six years of English instruction. However, according to an analysis of variance (ANOVA) the differences between the groups are not significant ($p = 0.66$).

Lexical sophistication: frequency profile

Lexical sophistication measures how sophisticated a text is in terms of word choice. This basically refers to high and low frequency words. One way of investigating this aspect of lexical richness is to draw a frequency profile of the words used in a text. Vocabprofile distinguishes between four main groups: the first 1,000 most frequent words, the second 1,000 most frequent words, an Academic Word List (AWL) and an Off-List that contains all the other words. Additionally one can add a so-called User List. In the present study the User List contains proper names, place names or country names as well as coinages and unclear words. Table 4 shows the average frequency profiles per year and per group as well as the overall mean values.

Table 4: Overview frequency profiles, in percent (argumentative essay)

	K1		K2		AWL		Off-List		User List	
	group. 1	**group 2**	**group 1**	**group 2**	**group 1**	**group 2**	**group 1**	**group 2**	**group 1**	**group 2**
2008	84.64	83.18	4.32	4.27	5.18	5.41	4.09	4.77	1.82	2.36
SD	3.13	3.59	1.93	1.65	2.12	1.64	1.57	2.01	0.64	1.09
2009	83.90	86.64	4.55	3.59	5.09	4.27	4.09	3.64	2.37	1.86
SD	3.49	2.32	1.53	1.12	1.55	1.27	1.78	1.55	0.96	0.69
2010	82.45	85.07	3.81	4.79	6.19	5.14	4.89	3.60	2.66	1.40
SD	1.83	3.98	1.37	1.65	1.38	2.08	1.16	1.28	1.69	1.40
mean	83.55	84.97	4.19	4.27	5.55	4.96	4.41	3.97	2.31	1.83
SD	2.89	3.60	1.58	1.55	5.55	1.75	1.50	1.65	2.31	1.17

The figures reveal that both groups use similar amounts of low and high frequency words. The percentages per category only differ marginally between the groups. In 2008 group 1 uses slightly more high frequency words (K1: 84.64 %, K2: 4.32 %) than group 2 (K1: 83.18 %, K2: 4.27 %). Group 2, on the other hand, shows a moderately higher percentage of low frequency words in their argumentative essays (AWL: 5.41 %, Off-List: 4.77 %) as compared to group 1 (AWL: 5.18 %, Off-List: 4.09 %). Although there are some minor differences, the two groups show an overall trend. Mainly high frequency words are used. These constitute around 88 % to 89 % of the texts as opposed to approximately 10 % of low frequency words.

A similar trend can be seen in 2009 and 2010. The majority of words used in the argumentative essays fall into the first two categories. Contrary to the data from 2008, the essays written in 2009 and 2010 show that group 2 uses more high frequent words than group 1 to a small degree. In 2009, 90.23 % of the words used in group 2's argumentative essays stem from K1 (86.64 %) and K2 (3.59 %). This percentage is only a little higher than group 1's proportion of high frequency words, 88.45 %. Of these, 83.90 % belong to the first

1,000 most frequent words and 4.55 % to the second 1,000 most frequent words. However, it should be noted that group 1 shows a slightly higher proportion of K2 words in their argumentative essays. Concerning low frequency words, the data suggests that group 1 uses slightly more academic words (5.09 %) and Off-List words (4.09 %) than group 2 (AWL: 4.27 %, Off-List: 3.64 %). Likewise, the data from 2010 suggests that group 2 uses marginally more high frequency words (K1: 85.07 %, K2: 4.79 %) as opposed to group 1 (K1: 82.45 %, K2: 3.81), whereas group 1 uses more low frequency words (AWL: 6.19 %, Off-List: 4.89 %) than group 2 (AWL: 5.14 %, Off-List: 3.60 %).

In general, the data reveals that both groups mainly make use of high frequency words. Almost 90 % of the words in the essays stem from the first and second 1,000 most frequent words. While only a little below 10 % of low frequency words are used. On average, around 2 % fall into the category of User List. These contain proper nouns, country names, coinages or unclear expressions. However, these are not of interest here. The focus is on the other four categories and the distribution of high and low frequency words.

For the purpose of illustration, figure 3 shows the mean distribution among the categories for group 1 and group 2 from the data collected between 2008 and 2010.

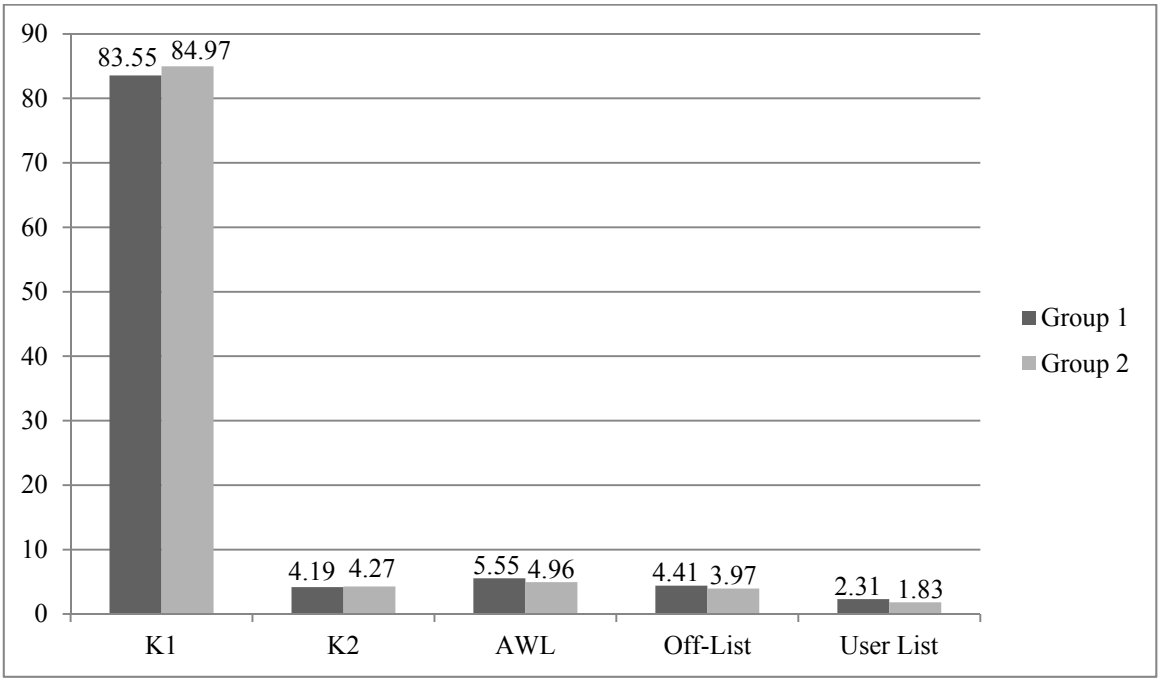

Figure 3: Frequency profile, mean values in percent (argumentative essay)

The figure illustrates that group 2 shows slightly higher percentages of high frequency words (K1, K2), while group 1 uses moderately more low frequency words (AWL, Off-List). Overall, these are only minor differences. The ANOVA confirms that these differences are

not significant. In general, it can be said that low frequency words only constitute a comparatively small proportion of an average essay in this data, roughly 10 %, whereas high frequency words account for almost 90 % of the words used by the learners. For the purpose of a more detailed analysis, the low frequency categories of AWL and Off-List are further examined below.

Academic Word List

The question arises of how the learners differ in terms of academic vocabulary. For each text, Vocabprofile produces a list of words that fall into the various categories, among them is the AWL. It distinguishes between types and tokens. Here the AWL types will be examined in more detail. The focus lies on both groups of learners as a whole. All the learners of group 1 together use 131 different types of academic words in their essays. Group 2 makes use of a comparable number of types, 130, that are related to academic vocabulary. This again does not show any differences between the two groups. However, having a look at how often certain words are used by different learners might reveal some differences. For this purpose a list was compiled that includes the different types used by the learners. The list is ordered according to how many learners within a group used a certain type. Table 5 shows the first 25 most frequent types based on the number of learners who use them in their essays. This frequency list does not include the number of occurrences within a text, but only considers one type per one person who uses this word form in the text. The full list can be found in Appendix 4.

Table 5 reveals that there is some degree of overlap between the two groups, but also some variation. The type *fees*, for example, is used by all the learners of both groups. Similarly, the words *financial, invested, definitely, intelligent* and *positive* are used by the same number of students in both groups. There are also word types that occur in both groups among the most frequent words, but are used by comparatively more learners in one of the groups. For example, the words *job* and *contrast* are used by more learners of group 1. On the other hand, group 2 shows a higher number of occurrences of *furthermore*, *invest*, *topic* and *academic*. Apart from these overlapping word types, there are also several words that only fall under the most frequent types of one of the two groups. These are, for example, *sector* or *access* in group 1. In group 2 words such as *achieve* or *equipment* appear in various essays.

Table 5: Overview of most frequent AWL types (argumentative essay)

	group 1	used by		group 2	used by
1	fees	33	1	fees	33
2	financial	8	2	financial	8
3	job	8	3	academic	6
4	sector	6	4	furthermore	6
5	access	4	5	invest	5
6	contrast	4	6	topic	5
7	fee	4	7	achieve	4
8	funded	4	8	equipment	4
9	furthermore	4	9	invested	4
10	income	4	10	motivate	4
11	invest	4	11	motivated	4
12	invested	4	12	computers	3
13	nevertheless	4	13	contrast	3
14	topic	4	14	criteria	3
15	academic	3	15	definitely	3
16	concentrate	3	16	finance	3
17	definitely	3	17	intelligent	3
18	funding	3	18	job	3
19	intelligent	3	19	media	3
20	major	3	20	negative	3
21	minimum	3	21	positive	3
22	positive	3	22	theme	3
23	alternative	2	23	access	2
24	appreciate	2	24	available	2
25	aspect	2	25	benefit	2

Overall, however, it can be said that there is some degree of overlap between the groups. Highly frequent words used by several learners are those concerned with finances (e.g. *fees*, *financial*, *invest*, *income*, etc.) and those that are related to an educational and professional field (e.g. *academic*, *job*, etc.). These word types are related to the topic of the argumentative essay, i.e. tuition fees, and seem to be highly topic specific. Apart from these specific terms, various learners seem to make use of words that relate to making comparisons and expressing a stance (e.g. *positive*, *negative*, *major*, *minimum*, *contrast*, etc.). It can also be noted that a variety of students of both groups use linking devices. One common linking word is *furthermore*. Several learners of group 1 also apply the word *nevertheless* to link ideas within a text.

All in all, it can be said that both groups of learners display a similar variety of academic words in their argumentative essays. On the one hand, these are related to the topic of tuition fees. On the other hand, some words are also related to the text type of argumentative essay such as linking devices. Well-written essays require a clear outline including logical transitions. Argumentative essays also involve presenting various arguments, making comparisons and presenting one's stance. For this purpose, various learners in the present study use words such as *positive*, *negative* or *major* to present their

arguments. This suggests that in the argumentative essays of the present study there are both topic specific elements as well as more general expressions that are associated with academic writing. Additionally, a great variety of individual word choices can be found in the data. A large number of words that are classified as academic are only used by single students. This suggests that there are various different academic words used by individual learners. At the same time, there are also several frequently used academic words in the essays that overlap between the two groups to some degree. These are either topic specific or text type specific.

OFF-List

The Vocabprofile also offers a list of types for the Off-List category. It produces a list for each learner text. In order to compare the groups, two lists were compiled that include all the types used by the learners of group 1 and those used by group 2. Then the lists were ranked according to how frequently certain words appear within the groups. Again the frequency counts are based on the number of different students who use a certain type. The results are presented in table 6. For the complete list see Appendix 5.

Table 6: Overview of most frequent Off-List types (argumentative essay)

	group 1	used by		group 2	used by
1	tuition	32	1	tuition	33
2	overcrowded	9	2	overcrowded	10
3	European	8	3	dropout	7
4	dropout	6	4	European	6
5	graduate	6	5	graduate	6
6	risen	6	6	deter	4
7	overcrowding	5	7	privilege	4
8	German	4	8	scholarship	4
9	scholarship	4	9	scholarships	4
10	scholarships	4	10	american	3
11	agenda	3	11	professors	3
12	deter	3	12	Austrian	2
13	exams	3	13	British	2
14	Austrian	2	14	budget	2
15	budget	2	15	budgets	2
16	career	2	16	disaster	2
17	crisis	2	17	Dutch	2
18	dutch	2	18	entitled	2
19	elite	2	19	etc	2
20	huge	2	20	German	2
21	outs	2	21	graduates	2
22	semester	2	22	Scandinavian	2

Similarly to the AWL, also the Off-List shows a certain degree of overlap between the two groups. The five most frequently used word types are *tuition*, *overcrowded*, *European*, *dropout* and *graduate*. In both groups a similar number of students use these words. Likewise,

the words *scholarship(s)*, *Austrian*, *Dutch* and *semester* appear in an equal number of different texts. It can also be noted that synonyms occur: One is used by students of group 1 and the other by group 2's learners. For example, *crisis* and *disaster* can be used in some contexts as synonyms. Two learners of group 1 use the word *crisis*, while the same number of students of group 2 uses *disaster* instead. Thus, it can be said that there is some degree of overlap and similarity between the groups, especially among the words that are used most by various learners.

Nevertheless, there are also some differences. Among the most frequent words, group 2 uses, for example, a slightly wider variety of terms to refer to nationalities, e.g. *American*, *British*, or *Scandinavian* in addition to those that are used by both groups, e.g. *Austrian* or *Dutch*. The rest of the words seem to be rather varied. These include words that are related to academia, such as *elite* or *career*, or to education in general, e.g. *exams*.

Overall, there seems to be a great variety between the individual learners, since the majority of word types in the category of Off-List are only used by single students within the groups. Only 22 or 23 types are used by more than one student in group 1 and group 2, respectively. This suggests that the learners vary greatly in their use of low frequency words, i.e. Off-List words. Words range from the field of university studies (e.g. *graduate*, *professor*), finances (e.g. *budget*, *scholarship*), nationalities (e.g. *Italian*, *British*) to expressions related to personal engagement (e.g. *motivation*, *boredom)* and several more semantic fields. These seem to be topic specific, since they are related to the topic of tuition fees. Additionally, the learners use a variety of words to present different points of view. For example, they refer to advantages and disadvantages, e.g. *pro*, *contra* or *counterargument*. The learners also use words that are related to expressing one's opinion, such as *impression*, *viewpoints*, *criticized* or *dismay*. Even evaluative adjectives are used to present one's stance. These include *ridiculous*, *idealistic*, *huge*, *unsupportive* or *unthinkable* among others.

All in all, it can be concluded that both groups show a variety of different word types that can be considered low frequency words. The majority of words in the Off-List category are only used by individual learners. These are related to various semantic fields as well as to argumentative essay writing in general. Concerning the most frequently used words by different learners, it can be seen that the five Off-List word types that are used most frequently overlap in group 1 and group 2. A variety of other words are also used by a similar number of students in both groups. Overall, it can be noted that the most frequent word types in the category of Off-List center on education. For example, they include *tuition*, *graduate*, *scholarship*, or *semester*. This is similar to the AWL. Thus, it can be said that the low

frequency words used by both groups are highly topic specific, but at the same time include some expressions that are related to the text type, i.e. argumentative essay.

9.1.2. Depth of vocabulary knowledge

In addition to breadth of vocabulary knowledge also some measures of depth are included in the analysis and these are the following: hypernymy, polysemy and meaningfulness.

Hypernymy

A measure that is associated with depth of vocabulary knowledge is hypernymy. As has been mentioned before, the hypernymy index in Coh-Metrix is based on human ratings. It has been found that the lower this index, the higher lexical proficiency (cf. *7.2. Tagging programs*). The results of the hypernymy index including nouns and verbs can be seen in table 7.

Table 7: Hypernymy (argumentative essay)

	group 1	group 2
2008	1.860	2.011
SD	0.193	0.248
2009	1.758	1.730
SD	0.283	0.117
2010	1.958	1.851
SD	0.182	0.251
mean	1.868	1.863
SD	0.229	0.239

Table 7 illustrates that there are no major differences between the two groups. Although in 2008 the hypernymy index seems to be lower for group 1, in 2009 and 2010 it is lower in the case of group 2. Overall, the mean values indicate that group 2 has a slightly lower hypernymy score. The ANOVA that was conducted shows that the differences between the mean values of both groups are not significant ($p = 0.94$). Thus, it can be said that both groups use a similar degree of specific words in their texts.

Polysemy

Another aspect that is related to depth of vocabulary knowledge is polysemy. Similar to hypernymy, it has been found that polysemy is related to lexical proficiency (cf. *7.2. Tagging programs*). The higher this score, the higher is lexical proficiency. Here are the results for the argumentative essay (Table 8):

Table 8: Polysemy (argumentative essay)

	group 1	group 2
2008	4.302	4.195
SD	0.452	0.534
2009	4.272	4.350
SD	0.376	0.287
2010	4.158	4.178
SD	0.318	0.314
mean	4.236	4.235
SD	0.373	0.382

The figures reveal that both groups show similar scores of polysemy. In 2008 group 1's scores are higher, whereas in 2009 and 2010 group 2 shows marginally higher scores. All in all, the mean values suggest that both groups are almost identical. The mean polysemy score for group 1 is 4.236, while group 2's score is 4.235. The ANOVA confirms that the differences are not significant ($p = 0.99$). Therefore, also this measure connected to depth of vocabulary knowledge does not show any substantial differences between the two groups.

Meaningfulness

The meaningfulness index is also calculated by Coh-Metrix. Concerning lexical proficiency, it has been discovered that low meaningfulness scores are associated with lexical proficiency (cf. *7.2. Tagging programs*). In table 9 the results are presented.

Table 9: Meaningfulness (argumentative essay)

	group 1	group 2
2008	422.285	426.112
SD	12.762	9.823
2009	427.781	416.151
SD	11.406	9.161
2010	431.568	428.823
SD	9.767	14.152
mean	427.607	423.964
SD	11.550	12.413

It can be seen that the figures differ from year to year. In 2008 group 1 shows slightly lower scores than group 2, while in 2009 and 2010 group 2's texts are related to lower meaningfulness scores than group 1's texts. On average, however, both groups do not differ significantly. Although group 2's average score (423.964) is lower than group 1's score (427.607), the ANOVA indicates that the differences are of no significance ($p = 0.22$).

Summarizing the results concerning depth of vocabulary knowledge, it can be said that the differences between the two groups are not significant. What can be noted is that the groups show highly similar results. This suggests that both groups, those who learn English as L2 and those who learn it as L3, are similarly lexically proficient when considering the level of depth of vocabulary knowledge. Let us now turn to several indices that are related to accessing vocabulary knowledge: familiarity, concreteness and imagability.

9.1.3. Accessing core lexical items

Familiarity

Familiarity is an index that is based on human ratings. It shows how familiar people are with certain content words. The higher the score, the higher is word familiarity. A high degree of familiarity, however, is associated with low lexical proficiency, whereas less familiar words seem to demonstrate a higher level of proficiency (cf. 7.2. *Tagging programs*). The scores of familiarity can be seen below (Table 10):

Table 10: Familiarity (argumentative essay)

	group 1	group 2
2008	582.428	582.474
SD	6.183	5.015
2009	584.491	586.682
SD	3.837	5.034
2010	584.256	585.011
SD	5.399	4.970
mean	583.773	584.749
SD	5.162	5.126

The data indicates that there is a high degree of similarity between the two groups. In 2008, 2009 and 2010 group 1 obtains only marginally lower scores of familiarity. This is reflected by the average scores for all three years. Group 1's scores (583.773) are slightly lower than group 2's scores (584.749). The differences are only minimal. Also the conducted ANOVA indicates that these are not significant ($p = 0.44$). This suggests that both groups use a similar degree of familiar words in their texts and this does not indicate any differences in terms of lexical proficiency.

Concreteness

Another aspect of accessing core lexical items is word concreteness. The less concrete words a text contains, the higher is lexical proficiency (cf. *7.2. Tagging programs*). Here are the results of the concreteness measure provided by Coh-Metrix (Table 11):

Table 11: Concreteness (argumentative essay)

	group 1	group 2
2008	350.884	357.881
SD	11.797	12.393
2009	351.789	346.729
SD	12.309	10.422
2010	361.534	351.007
SD	8.664	11.462
mean	355.354	351.793
SD	11.646	11.952

The concreteness index suggests that both groups have similar scores. In 2008 group 2 shows a slightly higher score than group 1, whereas in 2009 and 2010 group 2's argumentative essays reach a lower score of concreteness than group 1. The mean values also indicate that group 2's scores (351.793) are moderately lower than group 1's scores (355.354). This would suggest that they are slightly more lexically proficient. However, the differences are not significant ($p = 0.22$).

Imagability

The last category that is examined in terms of accessing core lexical items is word imagability. The lower this score is, the higher is lexical proficiency (cf. *7.2. Tagging programs*). Table 12 shows the results concerning imagability.

Table 12: Imagability (argumentative essay)

	group 1	group 2
2008	386.481	396.547
SD	11.052	12.957
2009	389.617	382.110
SD	13.419	8.890
2010	397.859	389.749
SD	11.356	14.835
mean	391.913	389.494
SD	12.593	13.586

In 2008 group 1's scores of imagability are lower than group 2's scores. In contrast, group 2's argumentative essays receive a lower score of imagability in 2009 and 2010. Overall, both groups are rather similar. On average group 2 (389.494) uses marginally less imagable words than group 1 (391.913). The ANOVA suggests that these differences are not significant ($p = 0.46$).

All in all, it can be seen that both groups show great similarities in all measures that have been explored so far. The ANOVA has not revealed any significant differences between the groups concerning the indices used in this study. The question now arises whether this will also be confirmed by the data obtained from the second text type, the letter.

9.2. Analysis of letter

Since the learners were not only asked to write an argumentative essay, lexical proficiency can also be examined in relation to the letters the students wrote. Again breadth and depth of vocabulary knowledge as well as access to core lexical meaning will be explored.

9.2.1. Breadth of vocabulary knowledge

Lexical diversity (VOCD)

The measure of lexical diversity illustrates that both groups show some degree of similarity. The results are presented in table 13. In 2008 and 2009 the figures only differ marginally between the groups. In 2008 lexical diversity is slightly lower in group 1's letters, whereas it is moderately higher in 2009. In 2010 again group 1's letters contain more varied words than group 2's texts.

Table 13: Lexical diversity (letter)

	group 1	group 2
2008	85.575	86.054
SD	14.925	13.368
2009	89.849	88.520
SD	18.619	16.398
2010	96.919	80.245
SD	15.664	14.952
mean	91.339	84.513
SD	16.610	14.929

Having a look at the mean values indicates that group 1's lexical diversity (91.339) is higher than group 2's score (84.513). However, the ANOVA does not indicate significant differences between the groups (p=0.08). This seems to suggest that in terms of lexical diversity both groups show similar degrees of lexical proficiency.

Lexical sophistication: frequency profiles

Lexical diversity has illustrated that there are no significant differences between the two groups. Is this also the case for lexical sophistication? Table 14 shows the distribution among frequency categories including standard deviation and the mean values for all three consecutive years the data was collected.

Table 14: Overview frequency profiles, in percent (letter)

	K1		K2		AWL		Off-List		User List	
	group. 1	**group 2**	**group 1**	**group 2**	**group 1**	**group 2**	**group 1**	**group 2**	**group 1**	**group 2**
2008	85.01	85.13	5.40	5.73	0.60	0.40	4.40	4.53	4.60	4.20
SD	2.78	1,81	1.73	1,51	0.58	0,72	1.34	1,88	1.46	1,91
2009	85.53	85.13	6.14	6.13	0.53	0.47	2.87	3.87	4.93	4.40
SD	2.11	2.88	1.63	1.85	0.53	0.71	1.22	1.93	1.18	1.61
2010	83.54	86.21	5.33	5.03	0.56	0.51	5.33	4.41	5.23	3.85
SD	2.74	2.54	1.56	1.76	0.66	0.62	1.92	1.35	1.84	1.28
mean	84.59	85.56	5.59	5.58	0.57	0.47	4.30	4.28	4.95	4.12
SD	2.65	2.44	1.62	1.73	0.58	0.66	1.84	1.67	1.53	1.56

As can be seen in table 14, the two groups show a certain degree of similarity concerning the frequency profiles. In 2008 the data offers a rather homogenous frequency profile with only minor variance between the groups. For both groups, around 90 % of the words fall into the two categories of the highest frequency levels, K1 and K2, while approximately 5 % are low frequency words (AWL, Off-List). The rest, roughly 4.5 % belong to the User List including, for example, proper names. A similar distribution among categories can be found in the data of 2009. The two groups only differ slightly. Group 1 uses slightly more frequent words (K1: 85.53 %, K2: 6.14 %) than group 2 (K1: 85.13 %, K2: 6.13 %). Concerning low frequency words, no clear tendency can be noted. Group 1 uses academic words slightly more often (0.53 %) than group 2 (0.47 %), whereas the latter group shows a higher proportion of Off-List words (3.87 %) as compared to group 1 (2.87 %). In 2010 the figures again show the same overall distribution. The vast majority of words fall into the high frequency categories, K1 and K2. Only small differences can be found between the groups. Group 2 uses a higher

proportion of highly frequent words (K1: 86.21 %) as compared to group 1 (K1: 83.54 %). By contrast, group 1 uses comparatively more words from all the remaining categories, i.e. K2, AWL, User List and Off-List.

Since the frequency profiles vary between years and do not show clear differences between the groups, let us now consider the mean values. Figure 4 illustrates the average distribution among the frequency levels. Here the differences between the groups appear to be rather small. Both groups' letters contain approximately 90 % of high frequency words. Around 85 % fall into the K1 category and roughly 5 % into the K2 category. Also the low frequency categories, AWL and Off-List, do not indicate any major differences between group 1 and group 2. This is also confirmed by the ANOVA that was conducted. The differences concerning the 1,000 most frequent words ($p = 0.13$), the second 1,000 most frequent words ($p = 0.97$), AWL ($p = 0.79$) and the Off-List ($p = 0.97$) are not significant. Only one category seems to be significant: the User List ($p = 0.03$). This is why we will have a closer look at the words that fall into this category as well as the two lists that are related to low frequency words, AWL and Off-List

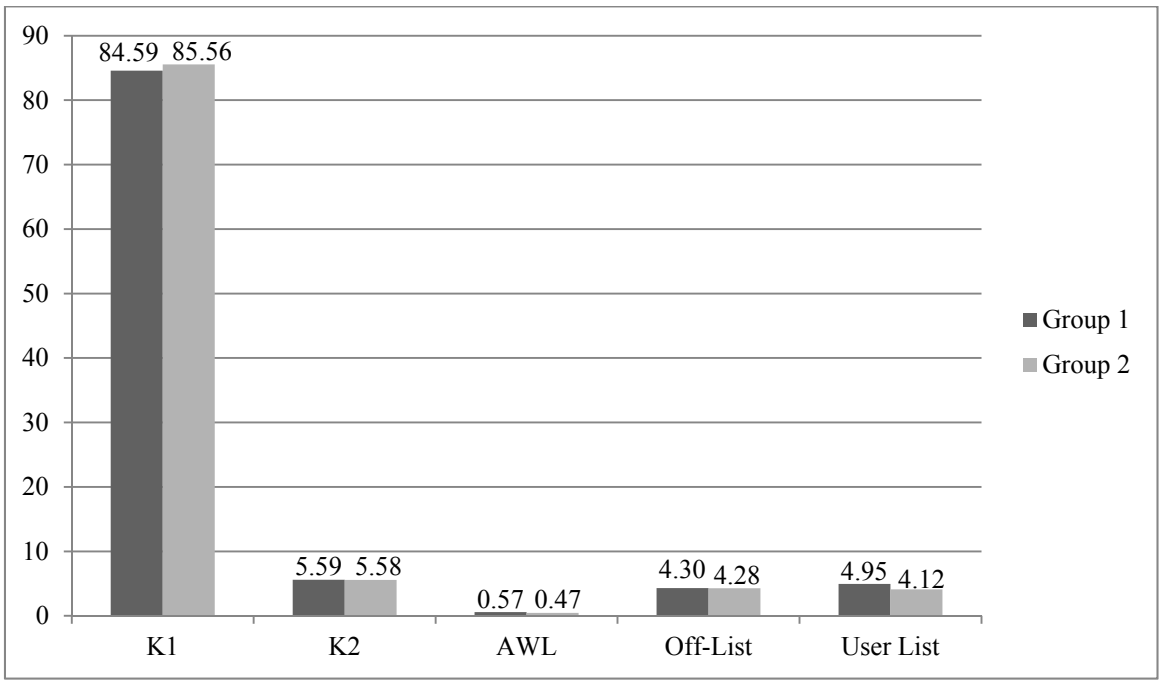

Figure 4: Frequency profile, mean values in percent (letter)

Academic Word List

In comparison to the AWL of the argumentative essays, here the list is rather short. It only includes a total of 16 types in the case of group 1 and 18 types for group 2. Table 15 gives an

overview of the various types ordered according to the number of letters where these types occur. Although the overall number of types is rather small, it is still interesting to consider which academic words are used by the learners. It can be seen that there are several words that are used by both groups: *grade*, *confined*, *couple*, *max*., *obviously*, *physically*, and *reaction*. The word type *grade* is the most frequently used expression in different letters. Some other words are also used by several students per group. In group 1 the words *job* and *nevertheless* are each used by two learners, while in group 2 *apparently*, *assumed* and *insecure* are each used by two students. Overall, it can be said that there is some degree of similarity, but still both groups use several different academic word types.

Table 15: Overview of AWL types (letter)

	group 1	used by		group 2	used by
1	grade	11	1	grade	3
2	job	2	2	apparently	2
3	nevertheless	2	3	assumed	2
4	committed	1	4	insecure	2
5	confined	1	5	achieved	1
6	couple	1	6	coincidence	1
7	definitely	1	7	colleague	1
8	denied	1	8	confined	1
9	encounter	1	9	couple	1
10	finally	1	10	demonstrate	1
11	max	1	11	furthermore	1
12	obviously	1	12	max	1
13	occurred	1	13	obviously	1
14	physically	1	14	period	1
15	reaction	1	15	physically	1
16	response	1	16	random	1
			17	reaction	1
			18	survived	1

Off-List

Apart from the AWL list, also the category of Off-List contains low frequency words. This list consists of words that do not belong to any of the other categories. Overall, group 1's learners use 80 different types, while the learners of group 2 use 83 word types that form part of the Off-List. Table 16 illustrates how many different learners use which word type in each group. The complete list of words in this category ordered by frequency can be found in Appendix 6. Table 16 reveals that the four most frequent word types in both groups are *bull*, *wheelchair*, *guy* and *bully*. Other highly frequent words that can be found in both groups are *slammed*, *geography, orphan* and *orphanage*. Additionally, an equal number of texts in both groups contain the expressions of *hallway*, *guy* and *mate*. Among the first ten words in the

list, eight overlap between the two groups. This suggests that there are certain words that are used by a variety of learners in both groups.

In spite of this, there is also a great variety of other word types that occur in several letters. The learners, for example, use different words to express negativity in relation to bullying. In group 1 several texts contain *humiliated*, *torture* or *bullied*, while group 2's letters include *horrible*, *slam, slamming* or *embarrassing*. Among the most frequent words that appear in various texts, there are also several swear words. In group 1 *ass* and *dumbo* are used by two learners each, whereas the word *hell* is used by two learners of group 2.

Table 16: Overview of most frequent Off-List types (letter)

	group 1	used by		group 2	used by
1	bull	24	1	bull	22
2	wheelchair	18	2	wheelchair	19
3	guy	13	3	guy	15
4	bully	11	4	bully	10
5	lockers	11	5	slammed	6
6	slammed	11	6	geography	5
7	geography	9	7	orphanage	5
8	orphanage	9	8	hallway	4
9	bullied	8	9	horrible	3
10	orphan	5	10	orphan	3
11	hallway	4	11	slam	3
12	ass	2	12	buddy	2
13	classmate	2	13	embarrassing	2
14	dumbo	2	14	guys	2
15	guys	2	15	hell	2
16	handicapped	2	16	impression	2
17	humiliated	2	17	mate	2
18	locker	2	18	menu	2
19	mate	2	19	skinny	2
20	torture	2	20	slamming	2
21	ah	1	21	weird	2
22	alright	1	22	asshole	1
23	ambulance	1	23	awful	1
24	anyways	1	24	bastard	1
25	awful	1	25	beatings	1

Considering the overall list of Off-List word types, it can be noted that there are several semantic fields connected to the topic of the letter. As already mentioned above, there are various words that are associated with negative feelings, e.g. *awful*, *horrible*, *nervous*, etc. Others are related to physical violence, such as *slam*, *punch, smacked*, or *brutal*. These are clearly linked to the topic of bullying. The topic also requires using words such as *bully* or *bullied*. Since bullying is often connected to school environments, words related to this can be found in the letters, e.g. *locker*, *classmate* or *geography*. Another category that can be discovered is one that refers to disability. Words such as *wheelchair* or *handicap* appear in the

texts. These are also related to the topic, since it is assumed that the writer has recently met an old schoolmate who used to bully him or her and this person is now sitting in a wheelchair.

Apart from words that are related to the topic, there are also expressions that can be associated with the text type of a letter. One main difference between the letters and the argumentative essays is that informal letters usually resemble a more oral or spoken style, whereas essays are more formal. In the data examined here, the letters include various expressions that are connected to spoken language. Both groups, for example, use *ha* or *yeah*. In group 1's letters also *ah*, *gosh* or *wanna* can be found, while *wow* and *gonna* appear in group 2's letters. Another example of a more oral and less formal style are swear words. They range from *dumbo* or *idiot* to *fucking* and *bitch*. They appear in both groups. It should be noted that the topic of the letter is highly emotional and personal and this might explain why the learners use swear words. These are mainly used to refer to the bully.

On the whole, these are rather general observations and cannot help to distinguish between the two groups of learners. Both groups show similar patterns when it comes to words that are classified as Off-List by Vocabprofile. Irrespective of whether students learn English as an L2 or L3, the data illustrates that they use vocabulary that is both topic specific as well as text type specific.

User List

So far no major differences between the two groups have been discovered. Only one index of lexical sophistication has indicated a significant difference, namely the User List. Therefore, the User List will be explored here. In group 1, 41 different word types are used by the learners, while in group 2 the number of varying types is 40. Among these, the most frequent ones can be found in table 17. The complete list is presented in Appendix 7.

Table 17 reveals that there is a certain degree of overlap. Among the first ten types in the list, nine occur in both groups. These include *Tony*, *Claxton*, *Brunswick*, *Huddle*, *Roger*, *Barbara*, *Jacksonville* and *Georgia*. This is not surprising, since these mainly are proper nouns referring to people or places that are specified in the task description and the text that serves as input (cf. Appendix 1 & 3). Additionally, unclear words occur in both groups in five different learner texts. Words were tagged as unclear, because they were marked as unclear in the transcripts. These were probably not clearly readable in the original handwritten learner texts. Thus, they are not of importance here.

Table 17: Overview of most frequent User List types (letter)

	group 1	used by		group 2	used by
1	Tony	33	1	Tony	33
2	Claxton	19	2	Roger	13
3	Brunswick	16	3	Claxton	10
4	Huddle	14	4	Brunswick	9
5	Roger	10	5	Barbara	6
6	Barbara	5	6	unclear	5
7	Jacksonville	5	7	Georgia	4
8	Landon	5	8	Huddle	4
9	unclear	5	9	Jacksonville	4
10	Georgia	4	10	Landon	4
11	Peter	4	11	coinage	3
12	Adolf	1	12	Peter	2
13	Anna	1	13	Susan	2
14	Annie	1	14	Alex	1
15	Bethel	1	15	Andy	1

However, what is interesting is the category of coinage. In group 1's letters not a single coinage appears, whereas there are three learners in group 2 who present instances of coinages in their letters. These include *bullier* and *rember*. From context it can be supposed that the first refers to *bully* and the latter to *remember*. One learner has two instances of coinages in the letter: *ai* as a greating (*ai buddy*) and *PH*. The meaning of *PH* is not clear from context. This might suggest that group 2's students experiment with language a bit more than group 1 or simply that they still show some insecurities as opposed to group 1.

Considering the User List in general, it can be said that there is a variety of proper names. These range from very common names such as *Peter*, *John* or *Lisa* to slightly rarer names, e.g. *Quintin*, and to names such as *Seppi*. Also place names form part of this category. These include, for example, *Brunswick*, *Jacksonville*, *Hawaii* or *Florida*. Additionally, *Landon* as part of *Landon High School* and *Huddle* as in *Huddle House*, a restaurant, fall into the category of User List.

Again no clear differences between the two groups can be found. Overall, the learners of both groups use a similar variety of different types in relation to proper names and place names. The only difference can be seen concerning coinages: More learners of group 2 use coinages than in group 1.

9.2.2. Depth of vocabulary knowledge

Hypernymy

An index that is associated with depth of vocabulary knowledge is hypernymy. The results of the hypernymy scores for both nouns and verbs can be seen in table 18.

Table 18: Hypernymy (letter)

	group 1	group 2
2008	1.230	1.213
SD	0.168	0.123
2009	1.214	1.258
SD	0.198	0.076
2010	1.162	1.185
SD	0.144	0.189
mean	1.198	1.216
SD	0.167	0.142

In 2008 group 2 shows slightly lower scores of hypernymy than group 1, while the opposite can be observed in the data from 2009 and 2010. Here group 1's hypernymy score is a little lower than group 2's score. The mean value also indicates that the letters written by group 1 receive a marginally lower score of hypernymy as opposed to those written by group 2. In spite of this, the overall scores seem to be rather similar. This is also confirmed by the ANOVA. The differences between the both groups are not significant ($p = 0.65$).

Polysemy

In addition to hypernymy also polysemy can be associated with the dimension of depth of vocabulary knowledge. The scores of polysemy are presented in table 19.

Table 19: Polysemy (letter)

	group 1	group 2
2008	3.922	3.976
SD	0.382	0.412
2009	3.889	3.946
SD	0.298	0.270
2010	3.907	3.827
SD	0.402	0.444
mean	3.906	3.908
SD	0.356	0.383

In the years 2008 and 2009 the letters written by group 2 receive a moderately higher score in this category, whereas in 2010 they receive a slightly lower score. Overall, it can be said that both groups use a similar degree of polysemous words in their texts. The mean values for group 1 (3.906) and group 2 (3.908) are almost identical. The ANOVA shows non-significant differences between the groups ($p = 0.99$).

Meaningfulness

Another index is related to word meaningfulness. Table 20 shows the results. In 2008 slightly lower scores of word meaningfulness are obtained by group 1, whereas in 2009 and 2010 group 2 demonstrates a marginally lower degree of meaningfulness concerning content words. On average, group 2's scores are moderately lower than those of group 1. Nonetheless, the differences are not significant ($p = 0.45$). This illustrates that here again the two groups do not vary.

Table 20: Meaningfulness (letter)

	group 1	group 2
2008	430.015	436.376
SD	8.028	9.461
2009	430.240	428.194
SD	10.403	7.467
2010	426.840	417.203
SD	12.396	19.611
mean	428.832	426.343
SD	10.433	15.860

9.2.3. Accessing core lexical items

Familiarity

Concerning access to core lexical items in the mental lexicon, one index that can be considered is the familiarity index provided by Coh-Metrix. In table 21 the results are presented. Table 21 indicates that the scores of familiarity vary only to some extent. In 2008 group 2 uses less familiar words than group 1. The contrary is the case in 2009 and 2010: Group 1's texts demonstrate a lower degree of word familiarity. The average scores illustrate that both groups obtain a comparable rate of familiarity (group 1: 587.059; group 2: 587.007). The ANOVA confirms that both groups do not differ significantly ($p = 0.96$).

Table 21: Familiarity (letter)

	group 1	group 2
2008	587.948	585.934
SD	4.395	4.666
2009	587.984	588.490
SD	4.134	3.757
2010	585.665	586.692
SD	5.022	3.669
mean	587.059	587.007
SD	4.583	4.028

Concreteness

How do the letters written by the two groups of learners differ in terms of concreteness? The results are presented in table 22. The scores of concreteness again only show some slight variation. Lower scores of concreteness are obtained by group 1 in 2008, whereas in 2009 and 2010 the participants who learn English as L2, i.e. group 2, display a lower degree of concreteness in their letters. The mean scores also highlight that group 2 (363.197) uses less concrete words than group 1 (366.709). However, the ANOVA reveals that the differences are not significant ($p = 0.48$). This suggests that both groups make use of a similar amount of concrete words.

Table 22: Concreteness (letter)

	group 1	group 2
2008	370.048	372.586
SD	15.838	15.410
2009	368.911	359.272
SD	26.700	7.423
2010	362.446	358.995
SD	16.097	28.774
mean	366.709	363.197
SD	19.509	20.792

Imagability

The last category to be examined is imagability. The scores of imagability are presented in table 23 below. The figures indicate that group 1 uses less imagable words in 2008, while in 2009 and 2010 group 2's texts receive lower scores of imagability. Overall, group 2 (401.402) demonstrates a lower degree of word imagability as opposed to group 1 (405.387). This seems

to suggest that according to this aspect of vocabulary knowledge group 2 displays a slightly higher degree of lexical proficiency, yet the differences between the two groups are found to be not significant (p = 0.39).

Table 23: Imagability (letter)

	group 1	group 2
2008	407.637	412.220
SD	14.649	16.502
2009	406.752	397.228
SD	22.444	6.572
2010	402.607	396.249
SD	16.464	25.806
mean	405.387	401.402
SD	17.578	19.777

9.3. Discussion

All in all, it can be said that both groups show almost identical levels of lexical proficiency in writing. The measures associated with breadth and depth of vocabulary knowledge and access to core lexical meanings do not show significant differences between the two groups as has been confirmed by an ANOVA. Only some minor differences have been found. Table 24 presents an overview of the Coh-Metrix indices. Those figures that indicate higher lexical proficiency are highlighted.

Table 24: Overview of the Coh-Metrix results

	text type	group 1	group 2
breadth			
lexical diversity	argumentative essay	**86.657**	84.898
	letter	**91.339**	84.513
depth			
hypernymy	argumentative essay	1.868	**1.863**
	letter	**1.198**	1.216
polysemy	argumentative essay	**4.236**	4.235
	letter	3.906	**3.908**
meaningfulness	argumentative essay	427.607	**423.964**
	letter	428.832	**426.343**
accessing core lexical items			
concreteness	argumentative essay	355.354	**351.793**
	letter	366.709	**363.197**
familiarity	argumentative essay	**583.773**	584.749
	letter	587.059	**587.007**
imagability	argumentative essay	391.913	**389.494**
	letter	405.387	**401.402**

There are three indices that demonstrate varying results for both text types. These are hypernymy, polysemy and familiarity. For example, the index of hypernymy shows that group 2 uses less specific words in the argumentative essays, while they use more specific words in the letters compared to group 1. This does not allow for distinguishing between the groups. Similarly, the index of familiarity shows ambiguous results. In the case of the argumentative essays, the learners of group 1 use slightly less familiar words, while the contrary is true concerning the letters. Also the index of polysemy shows different results for both text types. Therefore, the indices of hypernymy, polysemy and familiarty only demonstrate mixed results and do not distinguish between the two groups.

Apart from these three indices, however, one can see a slight trend. It seems that the learners who had six years of English in school (group 2) can be considered slightly more lexically proficient in terms of depth of vocabulary knowledge and access to lexical items, because they use slightly less meaningful, less concrete and less imagable words. On the other hand, group 1 seems to be slightly more proficient concerning breadth of knowledge. They use a bit more varied words in their argumentative essays as well as their letters. Similarly, the frequency profiles indicate that group 1 uses slightly more low frequency words than group 2. An overview of the frequency profiles of both text types can be found in table 25.

Table 25: Overview frequency profiles, in percent (argumentative essay and letter)

	K1		K2		AWL		Off-List		User List	
	group. 1	**group 2**	**group 1**	**group 2**	**group 1**	**group 2**	**group 1**	**group 2**	**group 1**	**group 2**
essay	83.55	84.97	4.19	4.27	5.55	4.96	4.41	3.97	2.31	1.83
SD	2.89	3.60	1.58	1.55	5.55	1.75	1.50	1.65	2.31	1.17
letter	84.59	85.56	5.59	5.58	0.57	0.47	4.30	4.28	4.95	4.12
SD	2.65	2.44	1.62	1.73s	0.58	0.66	1.84	1.67	1.53	1.56

Group 1 uses slightly more low frequency words (AWL, Off-List) than group 2. This is the case for both text types. In group 1's argumentative essays 5.55 % are academic words, while in group 2's essays only 4.96 % fall into this category. Concerning the letters, there are slightly more academic words used by the learners of group 1 (0.57 %) as compared to group 2 (0.47 %). Also the Off-List category shows some minor differences. Group 1 uses more words that do not belong to any of the other categories and can be considered low frequency words (4.41 %) as opposed to group 2 (3.97 %). Similarly, group 1 uses marginally more low frequency words in the letters (4.30 %) than group 2 (4.28 %).

Considering these indices, one can see a slight trend. Those learners who received two more years of instruction in English seem to have a slightly more developed breadth of

vocabulary knowledge, while the other learners appear to be moderately more proficient when it comes to depth and accessing lexical items in the mental lexicon. Overall, however, the results suggest that the differences between the two groups are not significant. Also a closer look at the low frequency categories AWL and Off-List does not reveal any major differences. Both groups use a range of topic specific as well as text type specific words. It can be seen that among both groups there is a variety of different word types that fall into the low frequency categories, since a high number of these are only used by individual students. Those types that are used by several students, however, overlap between the two groups to a certain degree. Thus, no significant differences can be found. Although group 2 received two years less of English instruction, it can be concluded that they are at the same lexical proficiency level as their counterparts who learned English for eight years. This raises the question of how it is possible that students who spent less time on learning a language can be at the same level.

One possible explanation lies in the exposure to English outside of school. English compared to other languages offers the advantage that it can be encountered frequently. It is present in the media, in advertisements, in movies or songs. It surrounds the learners all the time and provides language input. Both groups receive the same amount of exposure to English outside of the classroom and thus, it seems likely that those learners whose L3 is English can reach the same lexical proficiency level as those who learned English as L2.

Another explanation can be found in research on third language acquisition. It was found that bilingualism has a positive effect on learning another language (e.g. Cenoz 2003; Lasagabaster 2000; Muñoz 2000; Sanz 2000). One benefit of being multilingual is that it leads to a qualitative change in a learner's linguistic system, since new skills are developed once a person acquires an additional language (Herdina & Jessner 2000: 92). These involve, for example, skills concerning language learning. Already having experience in learning an L2 has been shown to be beneficial for learning a third language (Jessner 1999). Jessner (1999: 207) summarizes how third language acquisition differs from second language acquisition and highlights the changed quality of learning:

> The acquisition of a third language clearly differs from the acquisition of a second language because prior language learning experience changes the quality of language learning. This very often results in differing language strategies which the experienced language learner develops in contrast to the inexperienced one. This development of advanced cognitive skills in language learning can lead to the speeding up of the language learning process.

According to this, experienced learners reach a higher qualitative level of language learning and dispose of various different strategies as well as more developed cognitive skills. This

facilitates language learning and thus, might lead to faster language development. This seems to offer a plausible explanation for the results of the study. Although both groups are basically trilingual and also had French at school, group 1 learned English as L2 and for group 2 it was their L3. This suggests that group 2 had already gained experience in learning French for two years before they started with English. They might, for example, have developed strategies and some kind of metalinguistic awareness. This can possibly explain why they could develop their language skills faster than the other group and in the end could reach an equal level of lexical proficiency.

10. Conclusion

This study has investigated lexical proficiency and writing. Two groups of 12th grade Austrian learners were compared. One group learned English as L2 and had eight years of instruction, while the other group learned English as L3 and received six years of English instruction. Both groups were, in fact, trilingual and also learned French. For the first group French was the L3, whereas for the other group it was their L2. This suggests that both groups are experienced language learners and only differ in which language is their L2 and L3 and the time they spent on learning the two foreign languages. Considering that group 1 learned English for two more years compared to group 2, the results of this study might at first be surprising. Both groups demonstrate almost identical lexical proficiency in writing argumentative essays and letters. Nevertheless, possible explanations can be found when considering the equal amount of exposure to English outside the classroom and research on third language acquisition. It has been confirmed that learners who have prior experience with learning a foreign language can develop language skills in an L3 at a faster pace. This is due to having more developed cognitive skills and different strategies for language learning. Having this in mind, it is not surprising anymore that both groups are equally lexically proficient.

However, it has to be noted that further research is necessary to confirm the findings of the present study. Unfortunately, the argumentative essays and the letters written by the learners are rather short. Collecting longer text samples as well as longitudinal studies are needed to shed more light on lexical proficiency. It would be interesting to follow the development of L2 and L3 learners of English over the course of several years in order to determine how lexical proficiency develops and how exactly acquiring an L3 benefits from prior experience in terms of vocabulary knowledge.

The present study has shown that L3 learners of English can develop their lexical skills at a faster rate and thus, can reach the same level of lexical proficiency as L2 learners with two more years of learning English. This suggests that Austrian grade 12 learners reach the same level of lexical proficiency when they graduate from school irrespective of whether English is learned as L2 or L3.

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12. Appendix

Appendix 1: Task descriptions

Writing Test

TASK 1: Personal Response

Tuition fees are now a reality in Austria. Choose one of the following statements and write an argumentative essay on the topic. Use the chosen statement as the heading for your essay. Refer to the article above by supporting your main points with stated examples, opinions and given information. Your essay should not exceed a length of 250-300 words. Make sure you structure your text with paragraphs, introduction and conclusion.

A) Bad – Worse – Tuition fees

B) Tuition fees are a good thing: you get something for your money!

TASK 2: Personal Response

Imagine you are Roger Kiser. Write a letter to a former class-mate in which you tell him/her about the meeting with Tony, the Bull. Include some memories of your time at school with Tony and describe Tony's situation as it is now. Include information from the text! Make sure you follow the style of a personal letter. It should not exceed a length of 150-200 words. Use a separate sheet of paper.

Appendix 2: Input for writing task 1

Reading Test

Tuition fees gain allure in cash-hit European campuses

Luke Harding in Berlin
Monday October 13, 2003
The Guardian

[...]

1 Like many universities in Europe, Humboldt - founded in 1810 by the statesman Wilhelm von Humboldt - is overcrowded and under-funded. With German universities in crisis, and no help forthcoming from the government, vice-chancellors in Germany are now contemplating the previously unthinkable: tuition fees.

2 "We've got two choices. One of them is for Germany to become merely average. The other is for us to really invest in education and research," said Jürgen Mylnek, the Humboldt's president. "If the public sector isn't able to give us the money we need alternatives. In the mid to long-term there is no way round tuition fees."

[...]

3 Five years after Britain introduced tuition fees, the rest of Europe is following suit. Holland, Austria, Italy, Spain and Portugal have all recently introduced tuition fees ranging from €600 to €1,450 a year. France has modest fees too; while in Germany a law that prevents them from being charged is now being challenged.

4 It is only in relatively affluent Scandinavian countries like Sweden, Finland and Denmark that the principle of free education has not received a battering. In Sweden there are no tuition fees. Nor is there any prospect of introducing them. [...] The funding system, which dates from the early 1990s, is generous.

5 The right and left in Sweden agree that tuition fees are a bad idea. "There may be some good arguments for having such a system but it is not on the agenda," Henrik von Sydow, a conservative MP said. "We don't want to have a system where students have to pay for higher education." [...] But in struggling Euro-zone countries like Germany - and to a lesser extent Holland and France - tuition fees are now on the agenda.

[...]

6 The prospect of tuition fees has caused dismay among students, many of whom already work to make ends meet. Student union president Thomas Sieron said that fees would be a disaster.

7 The extra money would not be invested in universities; instead Berlin and other federal regions would simply cut higher education budgets even more, he said. Tuition fees would also deter students from poor backgrounds from going to university - an argument that student unions in Britain have deployed to little effect.

[...]

8 Supporters of tuition fees, meanwhile, argue that fees would not only generate extra revenue for the hard-pressed higher education sector, but they might also encourage students to take their studies more seriously. In France anyone with a baccalaureat - France's A-levels - can in theory attend the university course of his or her choosing. This democratic, if impractical, principal creates serious problems of overcrowding and de-motivation, and of course a sky-high dropout rate.

[...]

9 In Italy, dropout rates are also high. Anyone who obtains the secondary school certificate - the Italian equivalent of A-levels - has a right to go to university. But only 30% of Italian students graduate. "Italians have developed a habit of 'parking' themselves in universities while they make up their minds what to do with their lives," said Franco Pavoncello, a political scientist at John Cabot University in Rome.

[...]

10 Most German students do not graduate until the age of 26. There are no fees, and little financial or institutional pressure for them to sit final exams; as a result, middle-aged students are commonplace. Sitting in Humboldt's student canteen, Jana Wendering - a 22-year-old law student - said she was in favour of tuition fees, provided hard-up students could get scholarships. "Fees might be an incentive for people to work a bit harder," she mused, over a plate of goulash.

[...]

11 In Britain, of course, the argument has already moved on, with the education secretary, Charles Clarke, proposing top-up fees, which would see tuition fees rise from £1,025 a year to as much as £3,000. British fees are already the highest in Europe, followed by Holland, which charges its students €1,445 (£960) a year. But student funding in Holland is fairly generous: all Dutch students are entitled to a loan of €2,640 (£1,760) a year, which automatically becomes a gift or a grant if they subsequently meet certain minimum academic criteria, which most do.

12 The fear, among students in European countries where education is free, is that once tuition fees are introduced the cost of education will increase. University presidents admit tuition fees of, say, €1,000 a year will not be enough in the long run.

13 "The figure is too low. You can't fund a world-class university on €1,000," said Dieter Lenzen, the president of Berlin's Freie Universität, which was founded in 1948 in the American sector of Berlin. "How are we expected to compete with American universities which charge up to $28,000 a year? Colombia University has recently spent $145m on multi-media computers."

14 With fees now a reality across much of the EU, Britain does appear, for once, to be leading in Europe. But many students believe this is a dismal trend. "Just because Europe is moving in a certain direction doesn't mean this is the right direction," Colin Töck, of Germany's national union of students, lamented. [...]

Appendix 3: Input for writing task 2

Roger Dean Kiser: The Bully

I walked into the Huddle House restaurant in Brunswick, Georgia and sat down at the counter. I picked up a menu and began to look at the various items trying to decide if I wanted to order breakfast or just go ahead and eat lunch.

A

I looked up and turned to the side to see a rather nice looking woman standing before me.

B

"Is your name Roger by any chance?" she asked me.

"Yes." I responded, looking rather confused as I had never seen the woman before.

"My name is Barbara and my husband is Tony," she said, pointing to a distant table near the door leading into the bathrooms.

C

"I'm sorry. I'm, ah. I'm ah, confused. I don't think that I know you guys. But my name is Roger. Roger Kiser," I told her.

D

"Tony Claxton. Tony from Landon High School in Jacksonville, Florida?" she asked me.

"I'm really sorry. The name doesn't ring a bell." I said.

E

I finally decided to order breakfast and a cup of decaffeinated coffee. I sat there continually racking my brain trying to remember who this Tony guy was.

"I must know him," I though to myself. "He recognizes me for some reason." I picked up my coffee and took a sip. All of a sudden it came to me like a flash of lighting.

"Tony. TONY, THE BULL." I mumbled, as I swung myself around on my stool and faced in his direction.

F

"The bully of my seventh grade geography class," I thought.

How many times that guy had made fun of my big ears in front of the girls in my class! How many times this son-of-a-gun had laughed at me because I had no parents and had to live in an orphanage! How many times this big bully slammed me up against the lockers in the hallway just to make himself look like a big man to all the other students!

He raised his hand and waved at me. I smiled, returned the wave and turned back around and began to eat my breakfast.

"Jesus. He's so thin now. Not the big guy that I remember from back in 1957," I thought to myself.

G

Tony had accidentally hit several plates knocking them off the table as he was trying to get into his wheelchair which had been parked in the bathroom hallway while they were eating. The waitress ran over and started picking up the broken dishes and I listened as Tony and his wife tried to apologize.

As Tony rolled by me, being pushed by his wife, I looked up and I smiled.

H

"Roger" he said, as he nodded his head forward.

I

[...]

"You remember. Don't you?" he said, looking directly into my eyes.

"I remember, Tony," I said.

"I guess you're thinking 'What goes around comes around'," he said, softly.

"I would never think like that, Tony," I said, with a stern look on my face.

This was part of a reading task that required the students to fill in the gaps. The task can be found on the next page.

TASK 4: Matching

You must choose which of the paragraphs 1-5 fit into the gaps *A* - *I* in the literary text. There is one paragraph for each gap. There are more gaps than paragraphs. Indicate your answers in the table below.

1) All of a sudden I heard the sound of dishes breaking so I spun around to see what had happened.

2) "Excuse me," said someone, as they touched me on the shoulder.

3) I looked in the direction that she was pointing but I did not recognize the man who was sitting alone at the table.

4) She turned and walked back to her table and sat down.

5) "Tony" I responded, as I nodded my head, in return.

A	
B	
C	
D	
E	
F	
G	
H	
I	

Appendix 4: overview AWL types (argumentative essay)

(the frequency counts are based on the number of learners who use a certain type)

	group 1	used by		group 2	used by
1	fees	33	1	fees	33
2	financial	8	2	financial	8
3	job	8	3	academic	6
4	sector	6	4	furthermore	6
5	access	4	5	invest	5
6	contrast	4	6	topic	5
7	fee	4	7	achieve	4
8	funded	4	8	equipment	4
9	furthermore	4	9	invested	4
10	income	4	10	motivate	4
11	invest	4	11	motivated	4
12	invested	4	12	computers	3
13	nevertheless	4	13	contrast	3
14	topic	4	14	criteria	3
15	academic	3	15	definitely	3
16	concentrate	3	16	finance	3
17	definitely	3	17	intelligent	3
18	funding	3	18	job	3
19	intelligent	3	19	media	3
20	major	3	20	negative	3
21	minimum	3	21	positive	3
22	positive	3	22	theme	3
23	alternative	2	23	access	2
24	appreciate	2	24	available	2
25	aspect	2	25	benefit	2
26	criteria	2	26	controversial	2
27	finance	2	27	create	2
28	incentive	2	28	despite	2
29	issue	2	29	economic	2
30	majority	2	30	enormous	2
31	media	2	31	factors	2
32	motivated	2	32	funded	2
33	motivation	2	33	funding	2
34	negative	2	34	issue	2
35	obvious	2	35	issues	2
36	paragraph	2	36	jobs	2
37	principle	2	37	lecture	2
38	priority	2	38	normal	2
39	select	2	39	research	2
40	subsequently	2	40	task	2
41	topics	2	41	technology	2
42	unmotivated	2	42	accessible	1
43	available	2	43	adapted	1
44	accompanying	1	44	affect	1
45	achieve	1	45	alternative	1
46	achieving	1	46	aspect	1
47	aid	1	47	aspects	1
48	alter	1	48	assure	1
49	appropriate	1	49	attitudes	1
50	assure	1	50	automatically	1
51	availability	1	51	aware	1
52	comprehensive	1	52	conclusion	1
53	computers	1	53	consequence	1
54	concentrating	1	54	consequently	1

55	concluding	1	55	consists	1
56	conclusion	1	56	contradict	1
57	consequence	1	57	contribution	1
58	consequences	1	58	convinced	1
59	consuming	1	59	co-operatively	1
60	convinced	1	60	couple	1
61	create	1	61	debate	1
62	creates	1	62	debates	1
63	credit	1	63	decades	1
64	debate	1	64	depressing	1
65	decades	1	65	differentiation	1
66	demonstrating	1	66	discriminated	1
67	demonstrations	1	67	discrimination	1
68	despite	1	68	dramatize	1
69	diminish	1	69	eliminate	1
70	enable	1	70	enable	1
71	enhance	1	71	environment	1
72	evaluate	1	72	equipped	1
73	exclude	1	73	establish	1
74	excluded	1	74	expanded	1
75	experts	1	75	expanding	1
76	focus	1	76	experts	1
77	forthcoming	1	77	facilities	1
78	function	1	78	factor	1
79	fundamental	1	79	fee	1
80	generation	1	80	final	1
81	globe	1	81	finally	1
82	goal	1	82	fund	1
83	goals	1	83	fundamental	1
84	grades	1	84	generations	1
85	grant	1	85	goal	1
86	granted	1	86	grade	1
87	guarantee	1	87	grades	1
88	guaranteed	1	88	institution	1
89	ignored	1	89	investing	1
90	inclined	1	90	lecturer	1
91	indicated	1	91	lectures	1
92	insertion	1	92	logically	1
93	institution	1	93	minimum	1
94	institutions	1	94	minority	1
95	investing	1	95	motivation	1
96	involves	1	96	obtains	1
97	jobs	1	97	obvious	1
98	justified	1	98	obviously	1
99	justify	1	99	ongoing	1
100	lecturers	1	100	options	1
101	lectures	1	101	policy	1
102	mental	1	102	potential	1
103	methods	1	103	primary	1
104	minor	1	104	process	1
105	motivate	1	105	quote	1
106	obviously	1	106	range	1
107	option	1	107	reactions	1
108	overall	1	108	recovering	1
109	primary	1	109	regions	1
110	principal	1	110	required	1
111	priorities	1	111	requires	1
112	process	1	112	researches	1
113	projects	1	113	response	1

114	psychology	1	114	revenue	1
115	radical	1	115	role	1
116	ranging	1	116	sector	1
117	research	1	117	select	1
118	resolution	1	118	significantly	1
119	resources	1	119	source	1
120	revenue	1	120	sources	1
121	revolutionary	1	121	specific	1
122	sectors	1	122	statistic	1
123	selection	1	123	status	1
124	selective	1	124	stress	1
125	sources	1	125	structures	1
126	status	1	126	survive	1
127	stressed	1	127	sustain	1
128	task	1	128	theory	1
129	triggered	1	129	ultimately	1
130	ultimately	1	130	utilities	1
131	varied	1			
	total number of types	131			130

Appendix 5: Overview Off-List types (argumentative essay)

(the frequency counts are based on the number of learners who use a certain type)

	group 1	used by		group 2	used by
1	tuition	32	1	tuition	33
2	overcrowded	9	2	overcrowded	10
3	European	8	3	dropout	7
4	dropout	6	4	European	6
5	graduate	6	5	graduate	6
6	risen	6	6	deter	4
7	overcrowding	5	7	privilege	4
8	German	4	8	scholarship	4
9	scholarship	4	9	scholarships	4
10	scholarships	4	10	american	3
11	agenda	3	11	professors	3
12	deter	3	12	Austrian	2
13	exams	3	13	British	2
14	Austrian	2	14	budget	2
15	budget	2	15	budgets	2
16	career	2	16	disaster	2
17	crisis	2	17	Dutch	2
18	dutch	2	18	entitled	2
19	elite	2	19	etc	2
20	huge	2	20	German	2
21	outs	2	21	graduates	2
22	semester	2	22	Scandinavian	2
23	abolition	1	23	semester	2
24	adolescent	1	24	tuitions	2
25	aforementioned	1	25	abolished	1
26	american	1	26	accomplished	1
27	anyways	1	27	alarming	1
28	approx	1	28	antedate	1
29	atmosphere	1	29	assets	1
30	bale	1	30	avert	1
31	beforehand	1	31	biology	1
32	boarders	1	32	bureaucracy	1
33	boredom	1	33	canteen	1

34	British	1	34	career	1
35	broaden	1	35	con	1
36	capitalistic	1	36	conservative	1
37	convincible	1	37	contemplating	1
38	counterargument	1	38	contra	1
39	criterions	1	39	cope	1
40	criticized	1	40	crisis	1
41	decent	1	41	criticized	1
42	demotivated	1	42	daytime	1
43	demotivation	1	43	demoralization	1
44	discourage	1	44	demotivates	1
45	drastic	1	45	destines	1
46	drastically	1	46	dismay	1
47	dropouts	1	47	dropouts	1
48	efficiently	1	48	elitist	1
49	egoistic	1	49	equipments	1
50	enrols	1	50	exam	1
51	entitled	1	51	exams	1
52	etc	1	52	fulfill	1
53	euros	1	53	grasp	1
54	exam	1	54	headline	1
55	exhausted	1	55	height	1
56	fulfil	1	56	hopelessly	1
57	fundament	1	57	household	1
58	genuinely	1	58	huge	1
59	gonna	1	59	idealistic	1
60	graduates	1	60	indescribably	1
61	graduation	1	61	infrastructural	1
62	guaranty	1	62	injustice	1
63	hell	1	63	innocents	1
64	horrifying	1	64	Italians	1
65	hypocrite	1	65	laptops	1
66	impression	1	66	luxury	1
67	incite	1	67	miseries	1
68	inferior	1	68	molecular	1
69	inherited	1	69	multi	1
70	intellectual	1	70	nighttime	1
71	Italian	1	71	obliged	1
72	Italians	1	72	obstacle	1
73	lion	1	73	offspring	1
74	longtime	1	74	okay	1
75	movies	1	75	opponents	1
76	multi	1	76	outs	1
77	nutrition	1	77	overcrowding	1
78	obstacle	1	78	paces	1
79	opponents	1	79	pro	1
80	outcry	1	80	professor	1
81	overcrowd	1	81	prominent	1
82	overfilled	1	82	quit	1
83	paradise	1	83	reform	1
84	partying	1	84	reforms	1
85	pie	1	85	renovation	1
86	predisposition	1	86	reorganized	1
87	premises	1	87	repeal	1
88	privatization	1	88	repute	1
89	privilege	1	89	ridiculous	1
90	privileged	1	90	socio	1
91	pro	1	91	sophisticated	1
92	professors	1	92	swiss	1

93	reform	1	93	technologic	1
94	regression	1	94	TV	1
95	renounce	1	95	unsupportive	1
96	ridiculous	1	96	untrue	1
97	sift	1	97	viewpoints	1
98	slice	1	98	wealthier	1
99	spectrum	1	99	whiteboards	1
100	sponsored	1	100	withdrawn	1
101	sympathize	1			
102	talents	1			
103	thinkers	1			
104	todays	1			
105	treasons	1			
106	tuitions	1			
107	underfunded	1			
108	underprivileged	1			
109	unis	1			
110	unsocial	1			
111	unthinkable	1			
112	uproar	1			
	total number of types	112			100

Appendix 6: Overview Off-List types (letter)

(the frequency counts are based on the number of learners who use a certain type)

	group 1	used by		group 2	used by
1	bull	24	1	bull	22
2	wheelchair	18	2	wheelchair	19
3	guy	13	3	guy	15
4	bully	11	4	bully	10
5	lockers	11	5	slammed	6
6	slammed	11	6	geography	5
7	geography	9	7	orphanage	5
8	orphanage	9	8	hallway	4
9	bullied	8	9	horrible	3
10	orphan	5	10	orphan	3
11	hallway	4	11	slam	3
12	ass	2	12	buddy	2
13	classmate	2	13	embarrassing	2
14	dumbo	2	14	guys	2
15	guys	2	15	hell	2
16	handicapped	2	16	impression	2
17	humiliated	2	17	mate	2
18	locker	2	18	menu	2
19	mate	2	19	skinny	2
20	torture	2	20	slamming	2
21	ah	1	21	weird	2
22	alright	1	22	asshole	1
23	ambulance	1	23	awful	1
24	anyways	1	24	bastard	1
25	awful	1	25	beatings	1
26	beloved	1	26	bet	1
27	bet	1	27	bike	1
28	bitch	1	28	bruising	1
29	boss	1	29	bullied	1
30	brutal	1	30	bullying	1
31	buddy	1	31	bumped	1

32	bullying	1	32	bye	1
33	cheerleader	1	33	classmates	1
34	complexes	1	34	click	1
35	counter	1	35	console	1
36	dished	1	36	crazy	1
37	dough	1	37	crippled	1
38	exam	1	38	crisis	1
39	fantastic	1	39	dime	1
40	fist	1	40	diner	1
41	fragile	1	41	disastrous	1
42	gangster	1	42	disgraced	1
43	gosh	1	43	dude	1
44	hah	1	44	emotionally	1
45	handicap	1	45	fragile	1
46	hell	1	46	frustration	1
47	horrible	1	47	fucking	1
48	humiliate	1	48	girlfriend	1
49	idiot	1	49	gonna	1
50	junior	1	50	ha	1
51	lightening	1	51	harass	1
52	london	1	52	hint	1
53	mates	1	53	hood	1
54	math	1	54	humiliated	1
55	mess	1	55	invincible	1
56	mince	1	56	literally	1
57	misunderstand	1	57	locker	1
58	nervous	1	58	mates	1
59	nosebleed	1	59	misfit	1
60	perplexed	1	60	nausea	1
61	popped	1	61	ok	1
62	psychically	1	62	okay	1
63	reminders	1	63	omelet	1
64	shy	1	64	piggy	1
65	skinny	1	65	popped	1
66	slam	1	66	pork	1
67	slamming	1	67	punch	1
68	slim	1	68	punching	1
69	smacked	1	69	reunion	1
70	spiteful	1	70	schadenfreude	1
71	suicide	1	71	schoolmate	1
72	tease	1	72	shitty	1
73	toasted	1	73	shiver	1
74	toilet	1	74	sipping	1
75	underwear	1	75	softy	1
76	utmost	1	76	sparkling	1
77	vague	1	77	teased	1
78	wanna	1	78	toilet	1
79	wrinkled	1	79	tortures	1
80	yeah	1	80	tow	1
			81	vividly	1
			82	wow	1
			83	yeah	1
	total number of types	80			83

Appendix 7: Overview User List types (letter)

(the frequency counts are based on the number of learners who use a certain type)

	group 1	used by		group 2	used by
1	Tony	33	1	Tony	33
2	Claxton	19	2	Roger	13
3	Brunswick	16	3	Claxton	10
4	Huddle	14	4	Brunswick	9
5	Roger	10	5	Barbara	6
6	Barbara	5	6	unclear	5
7	Jacksonville	5	7	Georgia	4
8	Landon	5	8	Huddle	4
9	unclear	5	9	Jacksonville	4
10	Georgia	4	10	Landon	4
11	Peter	4	11	coinage	3
12	Adolf	1	12	Peter	2
13	Anna	1	13	Susan	2
14	Annie	1	14	Alex	1
15	Bethel	1	15	Andy	1
16	Bob	1	16	Christie	1
17	Bonnie	1	17	Damian	1
18	Bruce	1	18	Florida	1
19	Charly	1	19	France	1
20	Claxtion	1	20	Frank	1
21	Florida	1	21	Hary	1
22	Gerald	1	22	Jenna	1
23	Hawaii	1	23	Jessica	1
24	Henry	1	24	John	1
25	John	1	25	Johnny	1
26	Josef	1	26	Kate	1
27	Kiser	1	27	Kiser	1
28	Lilli	1	28	Linda	1
29	Lisa	1	29	Lisa	1
30	Michael	1	30	Luis	1
31	Pamela	1	31	Marcus	1
32	Paul	1	32	Mary	1
33	Quintin	1	33	Nina	1
34	Randy	1	34	Robert	1
35	Scott	1	35	Rosi	1
36	Stefanie	1	36	Sam	1
37	Steve	1	37	Sarah	1
38	Tim	1	38	Seppi	1
39	Toni	1	39	Steve	1
40	William	1	40	Tom	1
41	Wolf	1	41		
	total number of types	41			40

13. Abstract

Although recently vocabulary has received increased attention, there is still a gap in research concerning lexical proficiency in productive language use. This study investigates lexical proficiency and writing in a foreign language. Two groups of Austrian grade 12 learners of English are compared. The first group learned English as their first foreign language (L2) and received eight years of instruction, while for the other group English is their second foreign language (L3) and they only learned it for six years. The aim of the study is to determine how the two groups differ in lexical proficiency and which lexical characteristics the learner texts show. Two text types, an argumentative essay and a letter, were analyzed by means of Coh-Metrix and Cobb's Vocabprofile. The measures chosen are based on the framework of the lexical space, i.e. breadth and depth of vocabulary knowledge as well as accessing core lexical items or fluency (Daller, Milton & Treffers-Daller 2007). It has been found that both groups are equally lexically proficient in writing. This suggests that L3 learners of English can develop their lexical skills at a faster pace, since they can profit from prior language learning experience. It can be concluded that Austrian grade 12 learners reach the same level of lexical proficiency when they graduate from school irrespective of whether English is learned as L2 or L3.

14. German summary - deutsche Zusammenfassung

Diese Diplomarbeit erforscht Wortschatz und Schreiben in einer Fremdsprache. Es werden zwei Gruppen von SchülerInnen einer Maturaklasse verglichen. Für eine Gruppe ist Englisch die erste lebende Fremdsprache. Sie haben Englisch 8 Jahre lang gelernt. Wohingegen die andere Gruppe nur 6 Jahre Englisch gelernt hat und es ihre zweite lebende Fremdsprache ist. Das Ziel ist herauszufinden welche Gruppe über bessere lexikalische Kenntnisse und Kompetenzen verfügt und welche lexikalischen Charakteristika Schülertexte einer Maturaklasse aufweisen. Insgesamt werden zwei Textsorten, ein Brief und eine Argumentation, mithilfe von Coh-Metrix und Vocabprofile analysiert. Die Analyse verwendet als theoretischen Rahmen den sogenannten „lexical space“ (Daller, Milton & Treffers-Daller 2007). Dieser setzt sich aus drei Dimensionen zusammen: Breite und Tiefe des Wortschatzes sowie lexikalischer Abruf, d.h. wie schnell auf Wörter im mentalen Lexikon zugegriffen werden kann. Die Ergebnisse zeigen, dass beide Gruppen große Ähnlichkeiten aufweisen und sich auf gleichen lexikalischen Kompetenzniveaus befinden. Das weißt darauf hin, dass jene SchülerInnen, die Englisch als zweite lebende Fremdsprache lernen, von ihren Erfahrungen mit dem Erwerb einer vorherigen Fremdsprache profitieren können und so schnellere Fortschritte beim Erlernen einer weiteren Fremdsprache erzielen können. Zusammenfassend kann gesagt werden, dass SchülerInnen einer österreichischen Maturaklasse das gleiche lexikalische Level erreichen unabhängig davon, ob sie Englisch als erste oder zweite lebende Fremdsprache lernen.