The inferencing behaviour of Swedish EFL university students

A quantitative analysis of lexical inferencing in relation to vocabulary depth

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Abstract

The empirical study reported in this essay concerns Swedish university level learners of English as a foreign language (EFL) and their lexical inferencing skills, that is, their ability to guess the meaning of unknown words in a running text using different types of knowledge and textual cues (Haastrup, 1991). More precisely, the present investigation explores the relationship between students' inferencing behaviour and the quality of their vocabulary knowledge, which is commonly referred to as vocabulary depth (Qian, 2002). The study aims at examining whether learners demonstrating a deep vocabulary make use of different kinds of knowledge when inferring word meanings than learners with less lexical depth. Attention was also paid to how the word class of an unknown word influences the inferencing process.

Twenty students participated in the study and were asked to perform two different tasks: a vocabulary depth test (WAT) and a lexical inferencing task. The latter amounted to verbally inferring the meaning of 12 supposedly unknown target words from a reading passage composed for this particular experiment. As a means to investigate the inferencing procedure in relation to the grammatical form (i.e. word class) of a target word, half of the selected words were adjectives and the others were verbs.

The present findings indicate a positive correlation between inferential skills and vocabulary depth, as the students obtaining high WAT-scores were generally more successful in their inferencing than those with a less deep vocabulary. However, although the participants evinced different levels of lexical depth, they all tended to rely on the same knowledge sources. Finally, the current study suggests that the word class of a target word does not have a significant impact on students' inferential processes, as no statistical difference was observed between the inferences based on adjectives and the guesses based on verbs.

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1. Introduction

Vocabulary knowledge is generally assumed to be a fundamental part of the language learning process, since words are "primary conveyors of meaning" (Hatami & Tavakoli, 2012, p.1), and play an important role in conversation. In order to reach a high proficiency level, language-learners must therefore meet certain vocabulary requirements. The most recent studies on vocabulary size indicate that advanced learners of English are expected to know approximately 8000 word families in order to comprehend a majority of the words in the texts that they read (Schmitt, 2008).

Even with a large vocabulary in place, however, learners occasionally encounter unfamiliar vocabulary, which forces them to somehow compensate for their lack of knowledge. The most frequently used strategy in such cases is lexical inferencing, which involves "making informed guesses as to the meaning of a word in the light of all available linguistic cues in combination with the learner's general knowledge of the world, her awareness of the co-text and her relevant linguistic knowledge" (Haastrup, 1991, p.40). For example, a study on adult English as a second language (ESL) learners showed that lexical inferencing was employed during 58% of the times that the participants were faced with new vocabulary (Nassaji, 2003).

Furthermore, several findings indicate a positive correlation between various aspects of second language (L2) proficiency and lexical inferencing success. Some studies concern the connection between inferencing skills and language proficiency in general, while others investigate lexical inferencing in relation to specific aspects of language knowledge, such as reading comprehension (Wesche & Paribakht, 2010). However, Wesche and Paribakht (2010) argue that the dimension of L2 proficiency that best predicts inferencing success is vocabulary knowledge. It is common to model vocabulary knowledge as consisting of three different dimensions: breadth, depth and fluency. Breadth of vocabulary knowledge equals vocabulary size, whereas lexical depth and fluency have to do with learners' ability to employ words accurately (Daller, Milton & Treffers-Daller, 2007).

Given the centrality of vocabulary knowledge in lexical inferencing, several researchers have aimed at investigating the connection between inferential skills and different aspects of the lexical repertoire. For example, Qian (2005) examined the lexical inferencing behaviour of Korean- and Chinese-speaking ESL students in relation to vocabulary breadth and depth. Qian reports that when inferring the meaning of new vocabulary, the participants demonstrating deep vocabulary knowledge were more successful than others. The students

evincing lexical depth also tended to appeal to the global context surrounding the unknown words to a greater extent than those with a less deep vocabulary. However, as can be seen in sub-section 2.4, findings from a lexical inferencing study by Hatami and Tavakoli (2012) reveal a stronger relationship between inferential skills and vocabulary breadth than between inferencing success and lexical depth. The contrast between Qian's and Hatami and Tavakoli's results indicates a need to further investigate the connection between lexical inferencing and depth of vocabulary knowledge. Therefore, the present study will apply Qian's (2005) hypothesis to Swedish learners of English**.**

Further, in sub-section 2.4 we will also see that despite offering an interesting take on inferencing in relation to lexical depth, Qian's (2005) study has a gap in that it does not contain a motivation of the choice of target words. This leads to the question of whether the word class of an unknown word affects learners' ability to guess its meaning. Thus, the current investigation also seeks to examine the relationship between the participants' lexical inferencing behaviour and the word class of a target word.

The following section provides a background to the notion of lexical inferencing and further explains the different dimensions of vocabulary knowledge. Section 2 also contains a summary of the theoretical framework used in the present study, and eventually leads up to the research questions addressed in this essay. However, let us first examine different ways of defining lexical inferencing.

2. Background

2.1 Defining lexical inferencing

Lexical inferencing can be seen as a separate type of general inferencing, which, in turn, is a strategy that occurs within several scientific disciplines such as psychology, sociology and pragmatics (Haastrup, 1991). This sub-section accounts for different definitions of lexical inferencing suggested by Carton (1971), Bialystock (1978) and Haastrup (1991).

Carton (1971) was among the first to conduct research on what would later be known as lexical inferencing. He notably describes it as "a process of identifying unfamiliar stimuli", and says that inferencing in a foreign language "is concerned with the acquisition of new morphemes and vocables in 'natural contexts'" (p.45). According to Haastrup (1991),

the first sentence of Carton's definition implies that lexical inferencing is a general learning strategy.

Moreover, Bialystok (1978) argues that lexical inferences are based on explicit linguistic knowledge, implicit linguistic knowledge, or on other knowledge sources. According to Haastrup (1991), this wording indicates that, similarly to Carton (1971), Bialystok sees lexical inferencing as a learning procedure, and not just a strategy used to comprehend new vocabulary.

As stated in the introduction, Haastrup (1991) characterizes lexical inferencing as the ability to use various types of knowledge to make informed guesses of the meaning of unknown vocabulary in a running text. In contrast to Carton (1971) and Bialystock (1978), Haastrup thus primarily regards inferencing as a means for learners to understand new words without necessarily acquiring them, and suggests that although inferencing attempts sometimes result in incidental vocabulary learning, this is not always the case. As we will see in section 3, the present study does not concern vocabulary retention, but rather deals with learners' ability to understand a reading passage and thereby infer the meaning of supposedly unknown target words from the same text. Therefore, this essay will adopt Haastrup's view of lexical inferencing as a comprehension strategy.

2.2 Knowledge sources used in lexical inferencing

In the study by Carton (1971) mentioned in sub-section 2.1, the author deals with the types of knowledge used in L2 lexical inferencing, and differentiates between contextual, intralingual and interlingual cues. Contextual cues come from the learner's knowledge of the world or from the context surrounding the target word, whereas intralingual cues are based on the target language (L2), and interlingual cues originate from the learner's knowledge of his or her first language (L1) or any other language apart from the target language (Ln) (Haastrup, 1991).

According to Haastrup (1991), Carton's three cue types collectively "illustrate the basic knowledge sources used when interpreting a text or a word" (p.46). In turn, Wesche and Paribakht (2010) define knowledge sources as the "types of previous knowledge and information from the world and surrounding text used by L2 readers inferring new word meanings" (p.18). As a means to pinpoint the types of knowledge involved in lexical inferencing, Haastrup (1991) developed a taxonomy used to classify knowledge sources.

Examples of sources included in the taxonomy are the morphology and the orthography of the target word.

Moreover, Haastrup's (1991) framework is the foundation of a more recent categorization of knowledge sources proposed by Bengeleil and Paribakht (2004), which is used as a point of departure for the current investigation. Haastrup's classification of knowledge sources is exhaustive, as the complete taxonomy contains 28 specific categories. The framework presented by Bengeleil and Paribakht, on the other hand, consists of 14 more general knowledge sources, and is therefore seen as more accessible and thus better suited for the present study than Haastrup's original taxonomy. The following tables (1a to 1d) collectively provide an overview of the framework used in the present study. In the examples included in the tables, each target word is marked in boldface. P stands for *participant* and I stands for *interviewer*. Moreover, the words in parentheses were originally uttered in French or in Persian, as some of the examples are taken from a trilingual study. Firstly, Table 1a below contains explanations of the intralingual knowledge sources taken from Bengeleil and Paribakht's taxonomy. Each knowledge source is then exemplified by means of utterances from previous lexical inferencing studies.

Table 1a Intralingual knowledge sources

Knowledge source	Definition	Example
1. Word morphology	A knowledge source involving derivational knowledge, such as a notion of stems, prefixes and suffixes	P: "*geno* means gene and generation, and *cide* means to kill. So **genocide** should probably mean (to kill a generation)"[1]
2. Homonymy	This source includes knowledge of words in the participant's L1, L2 or Ln that are spelt or pronounced similarly to the target word	P: " . . . I think I know the word **refugees**, it could mean refuse"[2]
3. Word association	A knowledge source used when associating the target word with a word that the learner already knows	P: "[I]t says (opened) there must be closure ... I: So you got to the meaning from the word (opened)? P: Yes, (opened) and (door) it is usually either opened or closed" [2]

[1] Wesche & Paribakht, 2010, p.79
[2] Bengeleil & Paribakht, 2004, p.232

(Table 1a continued)

4. Sentence meaning	When employing this knowledge source, the learner makes use of the sentence that the target word is used in	P: "I didn't know what **craze** meant, but with the rest of the sentence, I think . . . it's (something that one believes deep down)" [3]
5. Syntagmatic relations	When using this knowledge source, the learner draws on knowledge of the meaning one or two of the words closest to the target word	P: "Reads aloud: 'It may be that people will want to help those outside their borders, especially when faced with ... um ... televised and ... **tangible** ... **tangible** ... **tangible** need . . .'
		P: I'm looking at the sentence from the beginning, it talks about the external help for these people, I think it is the essential things . . . because when there is a (disaster) this is what people think about and he mentions (needs) which comes after it . . ."[4]
6. Paradigmatic relations	This knowledge source involves inferring the meaning of a target word by replacing it with a known word	P: "To **tackle** the problem means to solve the problem . . . [tackled] can be replaced with solved" [4]
7. Grammar	A source including the use of grammatical knowledge, such as the characteristic endings of words belonging to a specific word class	P: "Of course **tangible** is an adjective . . . I know the adjective ends with these letters (ble) . . . "[4]
8. Punctuation	This source involves knowledge of punctuation rules	P: "I stopped at **frightening** and I thought about the word, but then I glanced and saw that there was not a full stop so when I finished the sentence I found (people), so it must be describing the (people) " [5]
9. Discourse meaning	When using this knowledge source, learners look at an entire paragraph or the whole reading passage in order to infer the meaning of a target word	P: " I want to see the whole paragraph, here (hysterical **media**) does not give a meaning like surely (media) here has another meaning"[5]

(Table 1a continued)

10. Formal schemata	A knowledge source involving the use of knowledge of textual structure and different text types	P: " The sentence is long; it takes up three lines . . . plus you have a discourse connective, *however* . . ."[6]

(Bengeleil & Paribakht, 2004)

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[3] Wesche & Paribakht, 2010, p.78

[4] Bengeleil & Paribakht, 2004, p.233

[5] Bengeleil & Paribakht, 2004, p.234

[6] Wesche & Paribakht, 2010, p.82

The following table (1b) shows the interlingual (i.e. L1-based) knowledge sources from Bengeleil and Paribakht's theoretical framework used in the current investigation. Similarly to Table 1a, Table 1b contains examples from previous studies illustrating how the knowledge sources can be used by learners inferring word meanings.

Table 1 b Interlingual knowledge sources

Knowledge source	Definition	Example
11. Lexical knowledge (L1 or Ln)	This knowledge source includes knowledge of languages other than the target language (L2)	P: "**journalist**… **journalist** comes from [journal] . . . I: What is 'journal'? You mean journal as a foreign word? P: No we use it [in Arabic], even the meaning we use"[7]
12. Word collocation (L1)	This source involves knowledge of words that go together in the learner's first language	P: "I think [**proactive**] means (exact); exact measurements. With measurements often such adjectives are used" [8]

(Bengeleil & Paribakht, 2004)

Table 1c below contains knowledge sources that are not based on linguistic knowledge. When looking at 1c, it should be noted that the theoretical framework used in this essay is a modified version of Bengeleil and Paribakht's taxonomy, as some of the knowledge sources referred to in their study are irrelevant in relation to the present investigation, whereas some categories needed to be added in order to accurately reflect the current data. The knowledge source in Table 1c referred to as *knowledge of topic* is included in Bengeleil and Paribakht's framework, and *world knowledge* comes from Haastrup's (1991) taxonomy. Each knowledge source included in 1c is illustrated by an example from previous research.

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[7] Bengeleil & Paribakht, 2004, p.235
[8] Wesche & Paribakht, 2010, p.81

Table 1 c Non-linguistic knowledge sources

Knowledge source	Definition	Example
13. Knowledge of topic	A knowledge source involving the usage of topic familiarity when inferring word meanings[9]	P: "Reads aloud: 'the people of Montserrat had to **flee** the Caribbean island' . . . an island in the Caribbean Sea, maybe ... it could be a hurricane . . . I: OK, how did you know it's a hurricane? P: The topic is about (environmental **refugees**) so it is related to the environment), it's not political or something"[7]
14. World knowledge	A knowledge source including the use of relevant prior knowledge and ideas of the world [10]	P: "I've already seen the word elsewhere because I play video games and I have a video game with that name" [6]

Finally, Table 1d below contains three other types of responses that have been added to the framework used in this study. The types of responses visible in 1d were not considered inferences, since something other than an actual guess was verbalized. The examples in 1d are also taken from previous lexical inferencing experiments.

Table 1 d Additional types of responses

Response	Definition	Example
15. Reported knowing word	The informant explicitly states that he or she knows the word	P: "[It's] very easy- one knows **cure** and then it fits the context [emphasis added]"[11]
16. No inferencing verbalized	The informant is unable to verbalize an inferencing attempt	I: "The first word is **indispensible** [emphasis added]. Can you guess its meaning? P: No"[12]
17. Miscellaneous category	All instances that do not fit categories 1-16	

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[9] Bengeleil & Paribakht, 2004
[10] Haastrup, 1991
[11] Haastrup, 1991, p.138
[12] Qian, 2005, p.42

2.3 Dimensions of vocabulary knowledge

As mentioned in section 1, a learner's lexical repertoire is multi-dimensional. Thus, vocabulary researchers distinguish between vocabulary breadth, depth and fluency. These aspects of vocabulary knowledge are generally tested separately by means of various assessment tools.

Breadth of vocabulary is defined as the number of words a learner knows, and is typically examined through vocabulary size- or translation tests. When assessing vocabulary breadth, no attention is paid to the learner's ability to use the word. Depth of word knowledge, on the other hand, refers to how well the student knows a word. Learners demonstrating depth of vocabulary knowledge are not only able to identify a word, but also know when and how to use it, and are aware of the word's grammatical functions. Finally, lexical fluency concerns the degree of automaticity with which the learner employs a word when speaking or writing (Daller, Milton & Treffers-Daller, 2007).

Returning to lexical depth, this dimension of vocabulary knowledge can be divided further into several components. Qian (1998) differentiates between different aspects of vocabulary depth, and says that learners evincing deep knowledge of a word know to pronounce and spell the word in question, and are also familiar with its syntactic and morphological features. Further, he states that vocabulary depth also includes knowledge of the word's synonyms and antonyms, as well as a clear idea of when and how the word is appropriately used. Qian (2002) explains that when readers are faced with unknown words, the aspects of lexical depth "interact with and inform one another so that the best result of comprehension can be achieved" (p.515). Thus, vocabulary depth is an important dimension of vocabulary knowledge in relation to lexical inferencing. However, as can be seen in the following sub-section, lexical breadth also plays a role in the inferential process.

2.4 Previous empirical research on lexical inferencing

In section 1, we saw that numerous studies have been conducted on lexical inferencing (see e.g. Haastrup, 1991; Bensoussan & Laufer, 1984; Nassaji, 2003; Paribakht, 2005; Qian, 2005; Wesche & Paribakht, 2010 Kavianpanah & Moghaddam, 2012; Hu & Nassaji, 2012; Ehsanzadeh, 2012; Hatami & Tavakoli, 2012). Out of these, four experiments deserve a closer look as a backdrop to the present investigation, and will thus be summarized in this sub-section.

Nassaji (2003) examined the inferencing behaviour of 21 intermediate EFL students by means of audio-recorded sessions during which the participants verbalized their inferences of unknown target words from a reading passage. The purpose of the study was notably to establish the knowledge sources used by the informants, and to determine the overall inferencing success. In short, the findings indicate that the students were generally unsuccessful in their lexical inferencing, and that the most common knowledge sources used to infer word meanings were word morphology and world knowledge. Nassaji's study offers valuable insight into L2 inferencing and it would be interesting to examine which knowledge sources Swedish EFL learners employ when faced with unknown vocabulary. However, it is worth pointing out that Nassaji's informants all had different language backgrounds and therefore had to speak English when verbalizing how they inferred lexis. Nassaji (2003) discusses this problem and says that "[i]n using their L2 learners may not be able to fully articulate and report their thought process" (p. 666).

Qian (2005) investigated the lexical inferencing skills of 12 newly arrived high-intermediate ESL learners in Canada, two of whom had Chinese as their mother tongue, whereas the remaining informants were Korean speakers. Qian sought to determine what knowledge sources the learners employed when performing a lexical inferencing task, and aimed at establishing how vocabulary depth relates to lexical inferencing. The participants' vocabulary knowledge was thus examined by means of the Depth of Vocabulary Knowledge Test. It is derived from the Word Associates Test (WAT), which is a commonly used test assessing vocabulary depth (Read, 1993, 1998). The learners were then divided into groups based on their test results, which permitted a comparison between their vocabulary depth and their performance on a constructed inferencing task. Qian found that the success rates were significantly higher for the participants with a deep lexical repertoire than for those with less depth of vocabulary knowledge. Moreover, he explains that the lexically skilled and thus more successful learners frequently used contextual information when performing the inferencing task. The informants with less lexical depth, however, primarily relied on clues that could be found within the target word, such as orthography or semantics. This lead Qian (2005) to conclude that "[t]he greater the depth of vocabulary knowledge, the better the learner can make use of context" (p.49). Moreover, although Qian's investigation offers an interesting hypothesis regarding the relationship between depth of vocabulary knowledge and inferential success, certain aspects of the study can be questioned. For example, Qian does not explain the choice of target words used in the inferencing task. As stated in the introduction, this raises the question of whether the word class of a word influences the inferencing

process. According to Wesche and Paribakht (2010), nouns and verbs are "more likely to attract inferencing attempts than other word classes" (p.11). However, there are, to my knowledge, no studies questioning how the grammatical form (i.e. word class) of a target word affects students' lexical inferencing procedures and whether it is easier to infer words from one word class than from another.

Furthermore, the effect of breadth and depth of vocabulary knowledge on lexical inferencing was also investigated by Ehsanzadeh (2012), who, by means of several vocabulary tests and an inferencing task, examined the inferential skills of 33 university level English learners with Farsi as their mother tongue. Among other things, Ehsanzadeh sought to establish which of the dimensions of vocabulary knowledge most accurately predicts inferencing success. Thus, the informants were asked to take the WAT and the Vocabulary Levels Test (VLT). The former was used to measure vocabulary depth, whereas the VLT assessed the breadth of each participant's lexical repertoire. The students also carried out an inferencing task, during which they were instructed to write down the meaning of a number of target words included in a reading passage. The results indicate that both vocabulary breadth and depth is of great importance in successful L2 lexical inferencing. However, Ehsanzadeh found a higher correlation between lexical depth and inferencing success than between inferential success and vocabulary breadth. This finding adds to the understanding of the importance of the different aspects of a learner's vocabulary in lexical inferencing. However, the documentation of the inferences is worth discussing, as Ehsanzadeh does not motivate his choice to let the informants present their guesses in writing. Further, it is also unclear whether the learners were using English or Farsi during the inferencing task. One might question this mode of procedure, considering that it is not possible to understand students' reasoning just by looking at the answers they write down.

Finally, Hatami and Tavakoli (2012) also investigated the role that breadth and depth of vocabulary knowledge play in L2 lexical inferencing. The purpose of the study was, among other things, to examine how lexical breadth and depth affect learners' inferencing ability, and to establish which of the two dimensions best prognosticates inferential success. The data, which came from 64 students enrolled in an English translation programme at a university in Iran, were collected during two sessions. Firstly, the participants were asked to take the WAT and the VLT, as a way to measure their vocabulary breadth and depth. The informants also read a simplified extract from a family magazine, and were instructed to underline the words in the text that they did not know. Two weeks later, the learners were given the same extract again. This time, however, they were asked to infer the meaning of the

words that had been underlined by a majority of the participants during the first session. Their inferencing scores were then compared to their results on the two vocabulary tests. The findings indicate that both breadth and depth of word knowledge are essential when inferring word meanings. However, in contrast to the previously mentioned studies by Qian (2005) and Ehsanzadeh (2012), Hatami and Tavakoli (2012) found that breadth of vocabulary is a "stronger predictor of L2 lexical inferencing success than depth of vocabulary knowledge" (p.14). Hatami and Tavakoli's study contains interesting information that helps clarify the inferential process. However, an important shortcoming acknowledged by the authors is that all the participants had approximately the same level of English. Hatami and Tavakoli explain that since all the informants were considered advanced ESL learners, the findings might not be applicable to other proficiency levels, as the lexical inferencing process and its connection to vocabulary knowledge may differ depending on the learner's language level.

In summary, four major shortcomings can be found in the previous research presented above. In Nassaji's (2003) investigation, the fact that the participants could not use their L1 when inferring word meanings may have prevented them from verbalizing their thoughts accurately. Qian (2005) does not motivate the choice of target words used in his study. Moreover, Ehsanzadeh (2012) does not explain his decision to let the participants express their inferences in writing, and Hatami and Tavakoli's (2012) research participants all had a similar proficiency level, which means that the observed tendencies might not apply to other learners. In the following section, we will se how all these shortcomings were taken into consideration in the present study. Based on the summarized studies and Qian's (2005) hypothesis that vocabulary depth correlates with success in L2 inferencing and the use of contextual cues, the following research questions will then be addressed:

- What is the relationship between Swedish EFL university students' lexical inferencing behaviour and their depth of vocabulary knowledge?
- Do the participants in this study evincing a deep lexical repertoire employ different knowledge sources than the informants with less vocabulary depth?
- How does the grammatical form of a target word affect learners' lexical inferencing processes?

3. Methods and materials

3.1 Participants

20 adult EFL learners volunteered to take part in the current study. As we saw in sub-section 2.4, the fact that Nassaji's (2003) research participants did not all have the same mother tongue and therefore had to use their L2 when inferring word meanings may have influenced their performance and complicated the task. All the participants selected for the present study were therefore native speakers of Swedish and thus had the same L1 background as myself, which allowed them to use both their first and second language when taking part in the study. It was assumed that this method of eliciting inferences would hopefully be more valid, and consequently generate interesting data.

In the study by Hatami and Tavakoli's (2012) reviewed in 2.4, the authors point out that since all the participants were advanced ESL students, the findings might only apply to learners at this particular level. With this in mind, the participants in the present study were expected to have different proficiency levels of English, as some had studied the language at university level for one semester, while others were on their second or third term of English. More precisely, the students were enrolled in three different undergraduate English courses at Lund University, Sweden: ENGA01 (first term), ENGA21 (second term) and ENGK01 (third term). Nine informants were first term students, whereas four participants were on the second level of English, and seven students came from ENGK01. As we will see in the following sub-section, the selection of informants was based on their scores on a vocabulary depth test.

3.2 Instruments

In order to conduct this study and address the research questions stated in sub-section 2.4, two different instruments were used. Firstly, the participants' lexical depth was assessed by means of the WAT, which, as mentioned previously, is a canonical vocabulary test created by Read (1993). The WAT consists of 40 test words in the form of adjectives. Each adjective is followed by eight words divided into two boxes. Only half of the words in the boxes relate to the test item, and the test-takers are required to identify these four words. The left box consists of potential synonyms to the test word, and the right box contains words that may or may not collocate (i.e. go together) with the adjective. In scoring, each correctly identified word from the two boxes rendered 1 point. Since there were four correct options for each test item, the informants could receive a maximum of 160 points. The WAT was chosen as an

assessment tool of vocabulary depth because it has been used in a number of previous lexical inferencing studies (see e.g. Nassaji, 2004; Ehsanzadeh, 2012). For instance, Nassaji (2004) asserts that the WAT has been "shown to have a high degree of internal reliability" (p.114).

The second instrument used in the current study was an inferencing task based on a short text about gay rights. In contrast to the reading passages used in a lot of the previous research mentioned in sub-section 2.4, the text used in the present study was composed with this particular experiment in mind to ensure that the text met the specific requirements for the current investigation. For example, the reading passage needed to deal with something that all participants would presumably be somewhat familiar with, as topic familiarity is a crucial factor in lexical inferencing (Pulido, 2007). It was assumed that the informants would have basic prior knowledge of gay rights considering that according to the national curriculum for the Swedish upper secondary school, teachers are required to pay attention to the rights of all different social groups in their teaching (Skolverket, 2013).

Moreover, the inferencing task also needed to contain a proportional number of familiar versus unfamiliar words. According to Wesche and Paribakht (2010), learners who attempt at lexical inferencing must know at least 95 % of the words in a running text in order to make informed guesses of the meaning of the remaining words. Therefore, the reading passage used in this study consists of 245 words, 12 of which were clearly marked as target words (see Appendix 1). Also, we saw in sub-section 2.4 that, to my knowledge, no current research explores the relationship between lexical inferencing and a word's grammatical form. Therefore, half of the carefully selected target words used in this study were verbs and the remaining target words were adjectives (see Appendix 2), as this permitted a comparison of how learners behave when inferring the meaning of words from two separate word classes (adjectives and verbs).

Finally, considering that the participants in this study were university level English learners, and therefore had a presumably high proficiency level, it was also necessary to choose very infrequent target words. Therefore, the words were retrieved from Paul Nation's frequency list, which categorizes English words according to how rare or common they are (Nation, n.d.). All the selected target words in the reading passage were found within the 13K or 14K frequency band of the list (i.e. the words were among the 13,000 or 14,000 words most frequently used in English), and were thus assumed to be unknown to the participants. This was verified through a pilot study where a group of students whose knowledge of English was supposedly similar to the participants' read the text and underlined all the words that they did not know. The results revealed that a majority of the learners from

the pilot study were familiar with some of the initial target words. Thus, a second draft was presented to the same students and was then used as part of the lexical inferencing task. The task was performed during individual sessions, which will be described in detail in the following sub-section.

3.3 Data collection

In this study, the data were collected during two different phases. Firstly, the WAT was administered to 45 students from the three different English courses presented in sub-section 3.1. The informants were given both oral and written instructions on how to complete the test, and they were assured that their test scores would remain confidential without affecting the results from their studies. At this point, the participants were instructed in English, as they took the WAT during a lecture where Swedish was not used.

Once all the vocabulary tests had been corrected and distributed, 30 of the informants were contacted and asked to perform the inferencing task during an individual session. The selection of participants for this part of the study was based on their WAT-scores. The aim was to include students with mixed test results and thus facilitate the comparison between their vocabulary depth and their inferential behaviour.

Out of the all the contacted informants, 20 students voluntarily participated in the lexical inferencing experiment. I met with each of these students individually in a quiet room for approximately 40 minutes to test their lexical inferencing skills. In Ehzansadeh's (2012) study summarized in 2.4, the students were instructed to write down their inferences, which, as stated earlier, might not be the ideal way to document their line of thought. Green (1998) asserts that verbal protocols are frequently used to capture learners' thinking processes, and argues that when used accurately, they generally yield reliable results. The participants in the present study were thus asked to infer word meanings orally, as an attempt to provide insight into how they actually reasoned when inferring word meanings. The method used during the sessions is known as the think-aloud technique, and is a type of introspective verbal reporting that amounts to verbalizing what comes to mind when faced with a task (Dörnyei, 2007). In other words, the participants in the present study were asked to infer the meaning of the target words in the reading passage (see Appendix 1) by vocalizing their guesses and explicitly explain their reasoning. The think-aloud technique is currently gaining ground within the field of applied linguistics and has been used to elicit inferences in several previous studies (see e.g. Bensoussan & Laufer, 1984; Haastrup, 1991; Nassaji, 2003;

Paribakht, 2005). Dörnyei (2007) argues that by using the think-aloud method, it is possible to reveal " the closest connection between thinking processes and verbal reports" (p.48). Think-aloud was thus considered a suitable research method for this study, as the current investigation seeks to examine learners' actual inferencing behaviour (i.e. how they go about guessing the meaning of unknown words).

At the beginning of each individual session, the notion of lexical inferencing and the purpose of the study were briefly presented to the informant. The student was then given a warm-up exercise as a way to practice the think-aloud technique. The exercise consisted of a short newspaper article where three supposedly unknown words had been circled. The participant was asked to guess the meaning of the circled words by verbalizing his or her thoughts using English, Swedish or a mixture of both.

When I felt that the participant knew how to think aloud, the reading passage described in sub-section 3.2 was introduced, and the student was encouraged to verbally infer the meaning of the target words using his or her L1 or L2, just like during the warm-up. All of the participants were instructed in Swedish to ensure that they understood how to perform the task. For documentation purposes, each individual session was audio-recorded.

3.4 Data analysis and scoring

Once all the think-aloud sessions described above had been conducted and recorded, each interview was systematically analysed as a means to get a general impression of the data. Moreover, in order to address the research questions, the success rates of the guesses needed to be determined. Following Nassaji (2004) and Wesche and Paribakht (2010), the inferences were assessed based on three categories (*successful*, *partially successful*, and *unsuccessful*) and a three-point scale (0 to 2). An inferencing attempt was considered successful if it was appropriate with regard to context, semantics and syntax. Considering that the participants were equally encouraged to use English and Swedish, their language choice did not affect the scoring. In other words, giving an appropriate Swedish equivalent of the target word was seen as just as successful as providing a suitable synonym in English. Each successful inference was awarded 2 points. Further, guesses that were semantically correct but syntactically inaccurate (e.g. an inference in the form of a noun instead of an adjective) were categorized as partially successful and rendered a score of 1 point. Approximate guesses, such as words that were almost synonymous with the target word were also considered partially successful. Sometimes, the students explained the meaning of the target word rather than verbalizing an

inference in the form of a specific word. In these cases, explanations indicating a somewhat accurate understanding of the target word were awarded 1 point. If, however, the explanations corresponded to the exact meaning of the target word, they were considered fully successful guesses rendering a score of 2 points. Occasionally, the lexical inferences were incorrect, or the informants were simply unable to deduce the meaning of a target word. These attempts were classified as unsuccessful and resulted in 0 points. When the utterances were difficult to categorize I consulted a bilingual dictionary or a dictionary of synonyms. Further, Table 2 below shows three different inferences of the target word *interdicting*, which have been classified according to the three categories. The Swedish utterances are followed by an English translation, and the inferred meaning of the target word is boldfaced.

Table 2 Successful, partially successful and unsuccessful inferences

Target word	Full success	Partial success	Unsuccessful attempt
Interdicting	"It should be that they are opposed to **forbidding** . . . "	"Interdicting is maybe **prevent** I believe"	". . . det betyder någonting med **tillåta** eller så" '. . . it means something like **to allow**'

Once the inferences had been categorized as successful, partially successful or unsuccessful, it was possible to determine how often each of the knowledge sources presented in sub-section 2.2 was associated with a successful inferencing attempt by giving each type of knowledge source a specific code. This system then permitted a calculation of the frequency and success rates of each knowledge source by means of a spreadsheet.

4. Results

4.1 Scores on the WAT and the inferencing task

The study reported in this essay concerns students' lexical inferencing behaviour in relation to vocabulary depth. Therefore, the present investigation is based on a lexical depth test (WAT) and an inferencing task. In Table 3 below the score distributions and test characteristics of the respective variables are presented.

Table 3 Score distributions and test characteristics of the WAT and the inferencing task for all participants combined

Value	Inferencing task	WAT
k	12	40
MPS*	24	160
Mean	5.95	138.2
SD*	2.70	12.86
Minimum	1	103
Maximum	10	149
Range	9	46

k = number of test items

MPS* = Maximum Possible Score

As can be seen in Table 3, the highest possible WAT-score was 160, since the participants could receive a maximum of 4 points for each of the 40 items included in the test. As to the inferencing task, each guess rendered a score worth between 0 and 2 points. The maximum inferencing score was thus 24 points, as the participants were asked to infer the meaning of 12 target words.

In order to address the first research question and investigate the connection between the students' inferencing behaviour and lexical depth, a correlation analysis was carried out. Correlations vary between -1 and +1. As the data were not normally distributed, a non-parametric Spearman correlation coefficient was used. It revealed a positive correlation between the WAT and the inferencing task scores, r_s (20) = + .52, $p < .05$. The notation summarizes the positive relationship between the 20 pairs of scores, which, in short, indicates that that the higher the inferencing score a participant obtained, the higher his or her WAT-score was. It also reveals that the relationship between the two variables is statistically significant at the conventional confidence level of $p < .05$.

As a means to further analyse the relationship between lexical inferencing skills and vocabulary depth, the participants were divided into two groups depending on their WAT-results. Following Nassaji (2004), the groups will hereafter be referred to as the *lexically skilled* (LS) and the *less lexically skilled* (LLS) group. In order to create a clear distinction between the two groups and avoid having participants in one group whose results were very close to the other group's scores, six students in the middle were left out. This

leaves us with 14 participants and thus, the LS group consists of the students with the seven highest WAT-scores and the LLS group includes the participants with the seven lowest scores on the vocabulary depth test. The remaining students will be taken into consideration in some of the following sub-sections. Table 4 below, however, only contains the score distributions of the LS and LLS students on the inferencing task and the WAT.

Table 4 Score distributions of the WAT and the inferencing task for the LS and the LLS group

	LS group		LLS group	
	Inferencing task	WAT	Inferencing task	WAT
Mean	7.14	148.14	4.43	124.71
SD	1.86	1.07	2.99	13.16

As can be seen in Table 4, the scores given to the participants in the two groups generally differed. For instance the LLS students' total mean score on the WAT is 124.71, whereas the LS group scored a mean of 148.14. The relatively high standard deviations illustrate that the scores on the two tasks were spread and not homogeneous. Moreover, the difference between the groups was verified through a Mann Whitney U test, which can be used to determine whether two non-normally distributed sets of scores are significantly different from each other. The test revealed a statistical difference in mean vocabulary depth, LS (*Median* = 149) and LSS (*Median* = 128), U = -3.180, $p < .001$. This tells us that the two groups differ in terms of lexical depth, and that we can be confident about this difference as a p-value of .001 means that there is only one chance in one thousand that this difference should not exist in the underlying population of scores.

4.2 Comparing the inferencing behaviour of the LS students and the LLS students

4.2.1 The frequency of the knowledge sources within the LS group and the LLS group
In sub-section 4.1, we saw that the LS students and the LLS students had different depths of vocabulary knowledge. This allows us to make a comparison of the inferences verbalized by the two groups respectively, and thus address the second research question, which is whether the participants evincing a deep lexical repertoire employ different knowledge sources than

the informants with less vocabulary depth. Table 5 below shows the frequency and success rates of each knowledge source among the lexically skilled students. Table 6 illustrates the frequency of use and frequency of success for each knowledge source within the LLS group.

Table 5 The frequency and success rates of the knowledge sources used by the LS group

	Successful		Unsuccessful		Total	
	n	%	n	%	n	%
1.Word morphology	12	60	8	40	20	100
2.Homonymy	13	40.6	19	59.4	32	100
3.Word association	2	66.7	1	33.3	3	100
4.Sentence meaning	11	42.3	15	57.7	26	100
5.Syntagmatic relations	3	21.4	11	78.6	14	100
6.Paradigmatic relations	0	0	5	100	5	100
7.Grammar	8	53.3	7	46.7	15	100
8.Punctuation	0	0	0	0	0	100
9.Discourse meaning	3	30	7	70	10	100
10.Formal schemata	0	0	1	100	1	100
11.Lexical knowledge (L1 or Ln)	7	87.5	1	12.5	8	100
12.Word collocation	1	100	0	0	1	100
13.Knowledge of topic	1	100	0	0	1	100
14.World knowledge	0	0	1	100	1	100
15.Reported knowing word	2	50	2	50	4	100
16.No inferencing verbalized	0	0	0	0	0	100
17.Miscellaneous category	0	0	1	100	1	100

Table 6: The frequency and success rates of the knowledge sources used by the LLS group

	Successful		Unsuccessful		Total	
	n	%	n	%	n	%
1.Word morphology	3	21.4	11	78.6	14	100
2.Homonymy	9	42.9	12	57.1	21	100
3.Word association	0	0	0	0	0	100
4.Sentence meaning	5	18.5	22	81.5	27	100
5.Syntagmatic relations	2	40	3	60	5	100
6.Paradigmatic relations	3	37.5	5	62,5	8	100
7.Grammar	0	0	4	100	4	100
8.Punctuation	0	0	0	0	0	100
9.Discourse meaning	5	41.7	7	58.3	12	100
10.Formal schemata	0	0	0	0	0	100
11.Lexical knowledge (L1 or Ln)	0	0	1	100	1	100
12.Word collocation	0	0	0	0	0	100
13.Knowledge of topic	0	0	1	100	1	100
14.World knowledge	0	0	1	100	1	100
15.Reported knowing word	1	14.3	6	85.7	7	100
16.No inferencing verbalized	0	0	3	100	3	100
17.Miscellaneous category	2	28.6	5	71.4	7	100

When looking at tables 5 and 6, it is important to note that in the present study, a knowledge source was considered utilized every time it was associated with a lexical inference (i.e. both when it was the only knowledge source employed and when it was used in combination with other knowledge sources). For instance, example (1) below illustrates a successful inference where homonymy is the only knowledge source utilized. In the second example, on the other

hand, the student is trying to deduce the meaning of *tortious* by means of not only homonymy but also her grammatical knowledge and one of the nouns surrounding the target word. In example (2), homonymy is thus one of multiple knowledge sources used to infer word meaning.

(1) "**Opine** seems like something from opinion, so it [means] to have an opinion"

(2) " Det första [ordet] tror jag är ett adjektiv för det kommer innan proposal och **tortious** . . . låter som torture, så det är något negativt tror jag"
'I think that the first [word] is an adjective because it comes before proposal and **tortious** sounds like torture, so it's something negative I think'

Returning to tables 5 and 6, they show that the knowledge sources homonymy, word morphology and sentence meaning were frequently employed within both groups. For example, the LS students used word morphology 20 times and the LLS group used it 14 times. The LS students also depended on their grammatical knowledge, as they employed this knowledge source 15 times. Moreover, grammar was used as a knowledge source 4 times by the LLS students. As to the use of discourse meaning, the LLS group employed this knowledge source 12 times, and the LS group used it10 times.

Furthermore, none of the students used punctuation as a knowledge source, and formal schemata was only employed once. A look at tables 5 and 6 also reveals that there were 3 cases, all of which occurred during a session with an LLS student, where the participant was unable to verbalize an inferencing attempt.

4.2.2 The inferencing success of the LS and the LLS participants
As to the students' inferential success, the overall success rates were calculated by dividing the number of successful and partially successful guesses with the total number of valid responses. In line with Nassaji (2003) the present study adopts the principle that each group collectively produced 84 responses, since the groups contained 7 participants who all responded to 12 target words. Occasionally, however, the participants did not verbalize a guess, as they sometimes reported knowing the target word or said that they were unable to vocalize an inference. Following Nassaji (2003), these responses were omitted. This leaves us with a total of 80 valid responses verbalized by the LS group and 74 responses from the LLS students. Out of the LS students' 80 valid responses 32 (40 %) were fully or partially successful, and 48 (60 %) were unsuccessful. Further, 13 (17.6 %) of the 74 valid responses

from the LLS group were fully or partially successful, whereas 61 (82.4 %) were unsuccessful. A chi-square analysis, which can be used to test whether a statistically significant relationship exists between categorical variables, showed that there is an association between the type of learner (LS or LLS) and whether the inference was successful or not, at $\chi^2 = 9.35$, $df = 1$, $p < .01$. In other words, the LS learners were more successful when inferring word meanings than the LLS students, and this was significant at a confidence level of p < .01.

When it comes to the success rates for the separate knowledge sources used when inferring word meanings, Table 5 shows the success rates of the knowledge sources used by the LS students and Table 6 reveals how successful the knowledge sources were when employed by the LLS group. When examining the percentages in tables 5 and 6, it should be borne in mind that the usage of a knowledge source was seen as successful when resulting in a partially or completely correct inference, regardless of the number of additional knowledge sources used to deduce the meaning of the target word. The success rates were thus calculated by dividing the number of fully or partially successful instances involving the knowledge source with the total frequency of each source. One should therefore remember that some knowledge sources were seldom or never utilized, which, naturally, affects their overall success rate. For instance, Table 5 shows that word collocation has a success rate of 100 % among the LS students. However, this knowledge source was only used on one occasion, which means that the one time this source was employed, it resulted in a successful inference.

Moreover, tables 5 and 6 show that within the LS group, 60 % of the guesses involving morphological knowledge were successful. For the LLS students, the success rate of this knowledge source is 21.4 %. Further, the use of grammar as a knowledge source lead to success in 53.3 % of the inferences made by the students in the LS group, and the LLS students never verbalized a successful inference using grammar.

Finally, Table 5 above illustrates that in 50 % of the instances where the LS students claimed to know a target word they also verbalized its meaning accurately. The LLS students stated the correct meaning of a target word 14.3 % of the times they reported knowing what it meant. These findings will be discussed in detail in section 5.

4.3 Lexical inferencing and the grammatical form of a target word

Let us now return to the third research question addressed in this essay by investigating the role of the grammatical form of a target word in the lexical inferencing process. Table 7 below contains the total means and the standard deviations of the inferencing scores obtained by the students when guessing the meaning of the adjectives and verbs used as target words in the inferencing task.

Table 7 The total mean scores and standard deviations for adjectives and verbs

	Adjectives	Verbs
Total mean score	0.42	0.58
SD	0.24	0.52

A first look at Table 7 indicates that the total mean score for the verbs is higher than the mean score for the adjectives. It is thus easy to assume that the participants found it less difficult to infer the meaning of verbs than the meaning of adjectives. However, a paired samples t-test (i.e. a test used to verify whether two normally distributed sets of scores are significantly different from each other) revealed that there was no statistically significant difference between the total mean scores, $t(5) = -.567$, $p = .59$. The notation summarizes the statistical insignificance and tells us that the results are likely to be random.

5. Discussion

5.1 The positive correlation between the WAT and the inferencing task

Returning to research question one, the present findings reveal a positive correlation between the participants' scores on the lexical depth test (WAT) and the inferencing task used in this study. Not surprisingly, this observation is in line with the results from the lexical inferencing studies summarized in sub-section 2.4. For example, Qian (2005) and Ehsanzadeh (2012) also report a positive correlation between the inferencing- and vocabulary depth test scores obtained by their research participants. In other words, the present study corroborates that inferencing success is associated with lexical depth and vice versa.

5.2 The participants' inferencing success

As to the inferencing skills of the LS and the LLS students, we saw earlier that 40 % of the valid inferential responses verbalized by the lexically skilled group were fully or partially successful, whereas 60 % were unsuccessful. In contrast, 17.6 % of the responses from the LLS group were successful and 82.4 % were unsuccessful. This means that more than half of the time, the participants from both groups were wrong when deducing the meaning of the target words. These results are in accordance with several previous lexical inferencing experiments (see e.g. Bensoussan & Laufer, 1984; Nassaji, 2003; Paribakht, 2005). For example, Nassaji (2003) reports that 55.8 % of the valid responses in his study were unsuccessful.

Two target words that may have affected the overall success rates mentioned above are *vanquish* and *solicitous*, as the participants generally did not infer the meaning of these words accurately. This may be due to the fact that they are phonologically and orthographically similar to several other words. For example, a closer look at the data revealed that the students were often misled by the affix *solo*, and thought that *solicitous* meant *alone*. Likewise, the participants typically mixed up *vanquish* and *vanish* as illustrated in example (3) below:

(3) " . . . and **vanquish**, I know what that means. It means to make disappear".

The type of unsuccessful inferencing behaviour visible in example (3) also occurs in the previously mentioned study by Nassaji (2003), who reports that students confused *waver* with *wave* and *affluence* with *influence*. Nassaji thus concludes that target words with potentially misleading features can have an impact on the inferential process. With this in mind we should note that, as exemplified in (3), the participants in the current study typically did not only state an incorrect definition of *vanquish*, but also reported knowing the word although what they really verbalized was, in fact, the meaning of *vanish*. This explains why the students sometimes uttered incorrect responses after saying that they knew a target word (see Table 6 and Table 5). Thus, the present findings are in line with the observations made by Nassaji, and underscore that homonymy can complicate the lexical inferencing process.

Although the participants in the current study were generally unsuccessful in their inferencing, the LS students had a significantly higher success rate (40 %) than the LLS students (17.6%). This observation corresponds with the results obtained by Qian (2005) who reports that the overall success for the lexically skilled students in his study was "2.3 times

higher than that for the [less lexically skilled] group" (p.46). Further, Qian explains that when it comes to the success for the specific knowledge sources involved in the inferential processes, the participants demonstrating vocabulary depth "achieved a much higher success rate than [the less lexically skilled students] in every category" (p.47). For instance, Qian reports that morphology contributed to inferential success in 57 % of the times it was used by the lexically skilled group and 36 % of the times it was utilized by the less lexically skilled learners in his study. Similar results were obtained in the current investigation, as the usage of morphology as a knowledge source (exclusively or in combination with other knowledge sources) was associated with a successful inference 60 % of the times it was used by the LS group and in 21.4 % of the cases where it was employed by the LLS students. Thus, returning to research question one in this essay, this further illustrates that students demonstrating vocabulary depth are generally more successful at inferring word meanings than those with a less deep vocabulary.

5.3 The knowledge sources used by the LS and the LLS students

Let us now return to the second research question: do the participants in this study evincing a deep lexical repertoire employ different knowledge sources than the informants with less vocabulary depth? In many cases, the inferencing behaviour of the two groups did not differ, as both the LS and the LLS students frequently used homonymy, word morphology and sentence meaning in their inferencing (see Table 5 and Table 6). This observation is partially in accordance with the results obtained by Nassaji (2003) and Qian (2005), who both conclude that students generally rely heavily on their morphological knowledge when performing a lexical inferencing task. Thus, the morphological features of a word have an important impact on the inferential process.

As for the use of homonymy, however, the present findings do not correspond with the results from the previous research summarized in sub-section 2.4. In the study by Qian (2005), for instance, homonymy was only used as knowledge source 5 times by his 12 research participants, whereas it was employed 53 times by the 20 informants in the current study (see Table 5 and Table 6). It should however be noted that Qian's informants had Korean or Chinese as their L1, which supposedly means that the English target words they were given were not phonologically or orthographically similar to any words in their first language. The participants in the current study, however, often made use of Swedish words that were homonymous with the target words, which may explain why they used homonymy

more frequently than Qian's research participants. In example (4) below, for instance, the informant is trying to infer the meaning of *tortious* by means of the similar sounding Swedish word *tortyr*, which means *torture*.

(4) "När jag läste ordet tänkte jag på tortyr . . . så jag antar att det är något som kan orsaka problem "
'When I read the word I thought of *tortyr* . . . so I'm guessing that it is something that can cause problems'

Another difference between the present findings and previous results lies in the usage of grammatical knowledge when inferring word meanings. According to Nassaji (2003), grammar was one of the least frequent knowledge sources in his experiment. Although the LLS group in the current study seldom relied on their grammatical knowledge, the LS students inferred the meaning of various target words using grammatical terminology in combination with other knowledge sources, even though the guesses were not always correct. In example (5) below, the participant is unsuccessfully trying to deduce the meaning of *tortious* by means of his grammatical knowledge as well as the context surrounding the target word.

(5) "Jag tänker att det är ett adjektiv för att det förekommer före ett substantiv som är huvudordet i en substantivfras . . . och från den stora kontexten fick jag en bild av att [ordet betyder] . . . problematiskt"
'I'm thinking that it is an adjective because it occurs before a noun that is the head of a noun phrase . . . and from the global context I got the idea that [the word means] . . . problematic'

When looking at example (5), it should be borne in mind that the participants in the present study have taken undergraduate courses in English grammar, which may explain why the LS students relied on grammatical terminology to a greater extent than Nassaji's (2003) informants.

So far, the knowledge sources widely employed by both groups of learners in the present investigation have been discussed. Now, however, the differences between the inferencing behaviour of the LS and the LLS students will be examined. As stated in section 1, this study partly hinges upon a hypothesis presented by Qian (2005), namely that although all learners tend to rely on both word- and context-based clues when inferring the meaning of unknown lexis, students with a deep lexical repertoire generally use contextual clues more often and more successfully than learners with less vocabulary depth, who rather rely on clues that can be found inside the target word.

Before discussing how Qian's (2005) hypothesis relates to the current findings, it should be noted that the theoretical framework used by Qian is not identical to the taxonomy from the present study, as his framework is partly categorized according to knowledge sources' location in relation to the target word. For example, inferences based on contextual clues are classified as belonging to the category *context beyond T-unit*, which is not the case in the current study. Instead, the present analysis adopts the principle that the knowledge sources referred to as sentence meaning and discourse meaning reflect learners' use of contextual clues in inferencing, as these knowledge sources are based on an understanding of the text surrounding the target word (see sub-section 2.2). Moreover, it is assumed that the use of the knowledge source word morphology included in the present study is equivalent to what Qian (2005) refers to as *clues within the test word*, since morphological knowledge concerns features found inside the target word.

Based on the assumptions above, the present findings only partly corroborate Qian's (2005) hypothesis. As stated earlier, both word morphology and sentence meaning were heavily employed knowledge sources by all participants combined. Just like Qian's research participants, all the students in the present study thus generally made frequent use of clues both within and outside of the target word, although discourse meaning, which reflects learners' use of the global context, was a somewhat infrequent knowledge source (see Table 5 and Table 6). As to the hypothesis that students with less lexical depth tend to use clues within the target word whereas the lexically skilled learners typically use contextual clues, the LS group in the current study employed word morphology 20 times and the LLS group used this knowledge source 14 times. Moreover, the LLS group used sentence meaning 27 times and discourse meaning 12 times, whereas the LS students used sentence meaning 26 times and discourse meaning 10 times. Although it may seem like the LS students used morphology more often than the LLS participants whereas the LLS group used contextual clues more frequently than the LS learners, a chi-square analysis showed that there was no statistically significant association between the type of learner (LS or LLS) and use of inferencing type. In other words, the difference is probably a mere coincidence, which means that the present investigation does not corroborate this part of Qian's hypothesis.

5.4 Limitations and suggestions for further research

The study presented in this essay is subject to several limitations that I will take into account in my future work. For instance, there was no second rater of the data, which might make the

results less reliable. Ideally, at least two people should have analysed the responses, and all the sessions should have been transcribed. When it comes to the scoring of the WAT-tests, this is also worth discussing. As stated in sub-section 3.2, the WAT amounts to choosing which four out of eight words that best relate to each test item. The scoring system used in the current study (i.e. awarding each participant with 1 point for each correctly identified word) can therefore generate potentially misleading results since it theoretically allows the test-takers to tick all the available options and still get the highest possible score, although they are only supposed to choose four alternatives. Thus, if I were to conduct another lexical inferencing experiment using the WAT, I would consider having a maximum score of 8 points (i.e. 4 points for choosing all the correct alternatives and 4 points for not ticking any of the other boxes). That way, the students would be awarded both for giving correct answers and for following the instructions properly. Moreover, I would also administer a general language proficiency test in addition to the WAT and the inferencing task. The reason is that even if some participants have studied English for a longer period than others like in the current study (see sub-section 3.1), it is not ideal assume that they differ due to studying in their first, second or third term, since a learner's proficiency level is not only affected by the duration of his or her language studies, but also by a number of other factors, such as age (DeKeyser, 2013) and student motivation (Dörnyei, 2003). I have also realized the importance of documenting learners' language backgrounds, as this information would have been relevant when analysing the use of interlingual knowledge sources in the current study.

Further, the topic of the reading passage used in this experiment could have affected the outcome of the study, given that gay rights can be considered a somewhat controversial subject, which thus could have made the participants reluctant to perform the task. Intuitively, however, this was not the case. Although there are no data to support this impression, it is noteworthy that the informants appeared to take the experiment seriously, and that several students explicitly stated that they found the reading passage interesting.

Finally, we saw earlier that, according to the present findings, the word class of a target word does not affect learners' inferential processes, since no statistical difference between the inferencing scores based on adjectives and verbs was observed. However, these results are affected by the assumed lack of research on lexical inferencing in relation to word classes, as this makes it difficult to view the present results in the light of other inferencing experiments. Thus, I suggest that the potential effect of word class on both inferencing attempts and inferential success should be examined in future research.

6. Conclusion

In the present study, was based on the following research questions:

- What is the relationship between Swedish EFL university students' lexical inferencing behaviour and their depth of vocabulary knowledge?

- Do the participants in this study evincing a deep lexical repertoire employ different knowledge sources than the informants with less vocabulary depth?

- How does the grammatical form of a target word affect learners' lexical inferencing processes?

 The research questions were addressed by means of a lexical inferencing experiment where 20 undergraduate students of English were asked to guess the meaning of supposedly unknown words from a reading passage. The participants also took a vocabulary depth test (WAT), which permitted an investigation of their inferencing skills in relation to their lexical depth. The connection between these two variables was examined through a correlation analysis indicating a positive relationship between the WAT-results and the inferencing scores. Similarly to Qian's (2005) informants, the learners in the present study with high scores on the WAT were thus more successful in their inferencing than those with less deep vocabulary knowledge.

 As to the second research question, the students demonstrating lexical depth typically did not make use of different knowledge sources than the other learners, as the knowledge sources homonymy, word morphology and sentence meaning were frequently employed by learners from both groups. The lexically skilled students did, however, rely on their grammatical knowledge more often than the less lexically skilled learners.

 Finally, the present investigation suggests that the word class of a target word does not have an impact on students' inferencing processes, as there was no statistically significant difference between the total mean scores of the inferred adjectives and the inferred verbs. It is however difficult to relate this finding to other lexical inferencing experiments because to my knowledge, no previous studies concern the relationship between inferential success and the word class of a target word. Thus, this aspect of lexical inferencing could be examined in future studies.

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Appendix 1: The reading passage

Is it OK to be gay?

Recently, the legislators in the state of Arizona passed a bill that would allow businesses in the area to discriminate against gay or lesbian costumers on religious grounds. Even though the Arizona governor Jan Brewer later vetoed the bill, saying that it would "create more problems than it supports to solve", this potentially **tortious** proposal **evinces** hostility towards the gay population in America, and indicates that some people find homosexuality **lewd**.

However, a recent survey reveals that public attitudes towards same-sex relationships **bifurcate** in the United States. According to the poll, more than half of the American population is opposed to **interdicting** gay couples from marrying legally. In fact, President Obama was even criticized for being too hesitant before endorsing same-sex marriage during his latest re-election campaign. The President's choice to openly support marriage equality was an **ineffable** act for many homosexual couples in America.

Internationally, various **extraneous** circumstances have also led to improved rights for the gay population. Last year, for instance, the French President François Hollande passed a law allowing same-sex couples in France to get married and adopt children. This was a **convivial** occasion of great symbolic value for the French gay community and for the mayor Hélène Mandroux, who had **fomented** a new marriage law since 2009, and who was **solicitous** to improve gay rights in France. All in all, a lot of people are trying to **vanquish** homophobia, and seem to **opine** that it is indeed OK to be gay.

Appendix 2: List of target words and their Swedish equivalents

Target word	Swedish equivalent
Tortious	Kränkande, skadegörande, otillbörlig, olaglig
Evince	Visa, visa prov på, röja, ådagalägga, manifestera
Lewd	Liderlig, otuktig, vällustig, oanständig
Bifurcate	Dela sig i två grenar, klyva sig
Interdict	Förbjuda
Ineffable	Outsäglig, obeskrivlig
Extraneous	Yttre
Convivial	Festlig, fest-, glad
Foment	Uppamma, ge ökad näring åt, underblåsa
Solicitous	Ivrig, angelägen
Vanquish	Övervinna, besegra, kuva
Opine	Mena, anse, tycka, antyda[13]

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[13] The Swedish equivalents were retrieved from *Norstedts engelska plus*, which is an online-version of the dictionary *Norstedts engelsk-svenska ordbok – professionell*