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# The Roles of Word Density and Topic 

 Familiarity on L2 Lexical Guessing
## of EFL College Students

한국 대학생 영어 학습자들의 어휘 추론:
단어 밀도와 지문 친숙도를 중심으로
교육학석사학위논문

# The Roles of Word Density and Topic Familiarity on L2 Lexical Guessing of EFL College Students 

by
SEUNMIN EUN

A Thesis Submitted to the Department of Foreign Language Education in Partial Fulfillment of the Requirements for the Degree of Master of Arts in Education

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# The Roles of Word Density and Topic Familiarity on L2 Lexical Guessing of EFL College Students 

한국 대학생 영어 학습자들의 어휘 추론: 단어 밀 도와 지문 친숙도를 중심으로 지도교수 이 병 민

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# The Roles of Word Density and Topic Familiarity on L2 Lexical Guessing of EFL College Students 

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## ABSTRACT

The Roles of Word Density and Topic Familiarity on L2 Lexical Guessing of EFL College Students

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In the research on second language learning, lexical guessing has received substantial attention. The present study explores the effects of word density and topic familiarity on lexical guessing of Korean EFL college students with an intermediate high level of English.

The participants in this study were 58 Korean university students. To control the topic familiarity factor, half of them (32 participants) majored in business administration or economics, and the other half (26 participants) majored in biotechnology or medical science. Participants completed a lexical guessing task in four different conditions - 98\% word density \& familiar, $98 \%$ word density $\&$ unfamiliar, $95 \%$ word density $\&$ familiar, and 95\% word density \& unfamiliar. They first responded to a topic familiarity
questionnaire with a 5-point Likert scale. Then, participants performed a lexical guessing task consisting of four passages. Four passages consisted of about 200 words, ten words were guessed at $98 \%$ word density level, and four words at $95 \%$ word density level. Lexical guessing scores were compared for the common four words between $98 \%$ and $95 \%$ word density.

According to this study's results, word density had a statistically significant effect on lexical guessing. The $98 \%$ word density level showed higher lexical guessing scores. The higher the word density, the more participants guessed unknown vocabulary accurately. Second, topic familiarity also had a statistically significant effect on vocabulary inference. The lexical guessing score was higher in the familiar text condition. The more familiar the text topic was, the more participants guessed unknown vocabulary accurately. The effects of the two independent variables (word density and topic familiarity) individually on the dependent variable (lexical guessing) were revealed. Third, however, an interaction effect of the two independent variables on lexical guessing was not observed.

The results of this study revealed that word density and topic familiarity had a positive relationship with lexical guessing. Therefore, it
has the following educational implications. First, it is necessary to teach students to improve their vocabulary knowledge so as to increase word density. Second, since background knowledge is essential in lexical guessing, it is necessary to include instructing both linguistic and background knowledge in English education. When teaching English, activating background knowledge should be considered so that the learner's schema can interact with the linguistic knowledge. Third, because the lexical guessing strategy can be used as a useful reading strategy, including lexical guessing strategy and developing methods to teach lexical guessing must be considered in Korean English education. The limitations of this study and suggestions for future research are presented in the conclusion.

Keywords: lexical guessing, word density, topic familiarity, reading comprehension

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## CHAPTER 1.

## INTRODUCTION

The current research investigates the effects of word density and topic familiarity on Korean EFL (English as a foreign language) collegelevel learners' lexical guessing and the relationship between the two factors. This chapter will introduce the motivation and the background of the thesis. Section 1.1 explains the background and the statement of the problem. Section 1.2 presents the purpose of the research, followed by the research questions in Section 1.3. Section 1.4 outlines the overall organization of the thesis.

### 1.1 The Background and Statement of the Problem

There are many factors to consider to enhance reading comprehension, such as individual differences, abilities, and experiences. Among those, vocabulary knowledge is one of the most vital factors in L2 reading comprehension. Empirical studies support a strong and reciprocal
relationship between vocabulary and reading comprehension (e.g., Coady \& Huckin, 1997; Grabe, 2004; Laufer, 1992; Lervåg \& Aukrust. 2010; Nation, 1990; Nation \& Carter, 1989). As vocabulary has high and positive correlations with reding comprehension, it has been found to be one of the most significant contributors to text understanding in L2. Nation (1990) and Laufer (1992) argued that vocabulary knowledge could be one of the prime predictors of L2 reading comprehension.

Moreover, the number of known and unknown vocabulary items in one text can decide the difficulty of a text. As Lervåg and Aukrust (2010) have suggested, vocabulary knowledge appears to be an essential predictor of both L1 and L2 reading comprehension development. Not only vocabulary breadth but vocabulary depth is also important in reading comprehension (e.g., Ehsanzadeh, 2020; Kaivanpanah \& Zandi, 2009; Qian, 2002; Rashidi \& Khosravi, 2010). Vocabulary is the sum of interrelated subknowledges, which should be regarded as multidimensional knowledge that includes various meanings. As a result, successful reading comprehension strongly depends on both vocabulary breadth and depth.

Compared to native speakers, second language learners feel more
pressure in terms of their vocabulary knowledge than L1 readers (Alderson, 1984; Laufer, 1992, 1997; Ma \& Lin, 2015). A strong correlation between L2 vocabulary knowledge and language abilities such as listening and reading suggested significant evidence that lacking vocabulary knowledge becomes the most serious block for L2 learners' language learning (Hoover \& Gough, 1990). Alderson (1984) found four possible reasons that make reading in L2 difficult (i.e., poor reading ability in L1, inadequate knowledge of L2, incorrect reading strategies for reading in L2, and misusing reading strategies). Inadequate knowledge of L2 includes a lack of vocabulary knowledge. As Laufer (1989) claimed, foreign/second language learners cannot acquire the vocabulary as native speakers because they cannot naturally be exposed to a huge amount of vocabulary as L1 readers are. So inadequate vocabulary size for comprehension is one of the main problems that L 2 learners have. Ma and Lin (2015) also found that a lack of adequate vocabulary knowledge is one of the primary limitations to reading comprehension among EFL Taipei college students. Among four vocabulary subcomponents, vocabulary size is the most factor strongly correlated with reading comprehension.

It is impossible for L2 learners to know all the different meanings of new words explicitly (e.g., Ahmad, 2012; Dycus, 1997; Paribakht \& Wesche, 1996; Twaddell, 1973). The more learners become proficient in L2, the more difficult texts they will encounter and the more unfamiliar words they will meet. In complex and higher-level texts, there would be a number of low-frequency and difficult words which learners might not know beforehand. In addition, some word usage is so narrow that it is difficult to encounter them often. Twaddell (1973) pointed out that by teaching singleword meanings out of context and making students memorize all words, teachers may mislead students into not considering words have various meanings. Ahmad (2012) also claimed that there are some limitations in intentional vocabulary learning. It is meaningful to memorize words up to a certain language proficiency level, but when the learners exceed a certain level, learning vocabulary without considering context can become rote learning. That's why explicit vocabulary learning, such as memorizing, is not always as effective and productive as expected.

In addition, given L2 learners' relative lack of vocabulary knowledge, all new words that English second language learners will
encounter cannot be understood simply by searching or consulting dictionaries (e.g., Haynes, 1984; Kibby, Rapaport, Wieland, \& Dechert, 2002). According to Kibby et al. (2002), when learners come across unknown words, they have three options for knowing the words' meaning and understanding the text. First is to look up an unfamiliar word using the dictionary, and second is to inquire with someone about the meaning of the vocabulary. However, the first and second option is not always possible for several reasons. Since it cannot be guaranteed that learners may have a dictionary or someone to ask, it is up to the reader to find and apply the most appropriate meaning among various contexts. Thus, the third option, using cues within texts to figure out the meanings of unknown words, is one of the most reasonable and practical solutions when confronted with unfamiliar words.

From these limitations, many studies try to find ways for learners to handle unknown vocabulary during reading. Lexical guessing is proposed as one potential option that L2 readers might exploit. According to Haastrup (1991), lexical guessing means "the process of lexical inferencing involves making informed guesses as to the meaning of a word in light of all
available linguistic cues in combination with the learner's general knowledge of the world, her awareness of context, and his/her relevant linguistic knowledge" (p. 13). Moreover, making lexical guessing while reading can unintentionally contribute to integrative reading and expand vocabulary knowledge. In a study by Juliana (2018a), comparing the effectiveness of lexical guessing and lexical glossing, the result showed that the group that used the lexical guessing strategy could guess the unfamiliar word meaning more precisely and enhance reading comprehension rather than using explicit word gloss. Therefore lexical guessing utilizing contextual information has become an alternative and compensating tool to understand unfamiliar words in the text.

Lexical guessing has been found in many studies as one of the most helpful and favored approaches to some readers, especially native readers and advanced L2 readers (e.g., Bensoussan \& Laufer, 1984; Carnine, Kameenui \& Coyle, 1984; Coady \& Huckin, 1997; Dycus, 1997; Fraser, 1999; Grellet, 1998; Haastrup, 1991; Hosenfeld, 1977; Juliana, 2018a; Liu \& Nation, 1985; Paribakht \& Wesche, 1999). Bensoussan and Laufer (1984) claimed that lexical guessing is an effective way to help understand a text by
guessing an unfamiliar word using contextual clues. Liu and Nation (1985) also claimed lexical guessing is one of the most important strategies when predicting meanings of low-frequency vocabulary. Coday and Huckin (1997) strongly recommend that one of the most useful methods for advanced L2 learners to comprehend texts is to apply a lexical guessing strategy.

Although lexical guessing is often suggested as a remedy for a limited vocabulary, less research has been conducted on using context to infer unknown words for second or foreign-language learners. Experimental studies on lexical guessing related to L2 readers are scarce compared to L1 readers. Moreover, L2 readers especially often resort to a dictionary when encountering an unfamiliar word, or they ignore it rather than trying to guess the meaning of a word. Therefore lexical guessing does not always work well in L2 learners' reading as opposed to L1 readers (e.g., Goodman, 1967; Macnamara, 1970; Oiler, 1972; Twaddell, 1973). Goodman (1967) suggested that although four different factors (e.g., L1 background, L2 proficiency level, L2 reading ability, and the role of strategy-training or instruction) are important in the reading process, these factors cannot function well when reading in a foreign language. Macnamara (1970)
showed that the imperfect language knowledge of L2 readers hinders using contextual information in reading more challenging. Oiler (1972) also suggested that L1 and L2 readings are essentially different, and bottom-up processing is employed more by L 2 readers than by L 1 readers. So it is not easy for L2 learners to use a lexical guessing strategy. According to Twaddell (1973), when L1 readers come across unfamiliar words in reading, they usually choose to skip them or guess their meanings from context freely; however, L2 readers were not fluently using the guessing strategy as L 1 readers.

In guessing the meaning of unknown words, which factors make lexical guessing of L2 learners difficult were investigated. L2 language proficiency has been examined as one of the meaningful factors (Alavi \& Kaivanpanah, 2009; Bengeleil \& Parihakht, 2004; İstifçi, 2009; Lee \& Lee, 2012; Parel, 2004; Park, 2020). Linguistic knowledge (Chen, 2018; Kaivanpanah \& Alavi, 2008; Zhang \& Koda, 2012), topic familiarity (Pulido, 2000; Pulido, 2003, 2007; Atef-Vahid, Maftoon, \& Zahedi, 2013; Kaivanpanah \& Rahimi, 2017), vocabulary knowledge (Hatami \& Tavakoli, 2012; Hu \& Nassaaji, 2014), the existence of contextual cues (Bengeleil \&

Paribakht, 2004; Cai \& Lee, 2010) and word density (Hirsh \& Nation, 1992; Hu \& Nation, 2000; Laufer, 1997; Wesche \& Paribakht, 2010) were also examined to find how much these factors can affect lexical guessing, and which factor affects lexical guessing the most.

Still, little attention has been given to these factors with respect to lexical guessing in an EFL context. It is necessary to investigate factors making L2 readers' lexical guessing successful or unsuccessful in the text. In addition, only a handful of research has focused on lexical guessing in the Korean EFL context. Kim (2010), Lee \& Lee (2012), and Park (2020) reported a relationship between language proficiency and lexical guessing. Except for these limited studies, no studies exist that examine factors affecting the lexical guessing of Korean L 2 readers.

### 1.2 Aims of Research

Currently, not only is research related to lexical guessing in an EFL context scarce compared with L1 contexts, but existing studies haven't adequately addressed the lexical guessing performance of EFL learners, it is
still an open question as to what happens when foreign language learners meet unknown words in L2 reading contexts. Also, because learners' vocabulary and background knowledge is significantly related to guessing ability, various studies individually investigated the effects of word density and topic familiarity on L2 reading comprehension. But those studies have not considered how a combination of these factors affects lexical guessing in an L2 context. Also, it is currently unclear how different word density and topic familiarity levels may affect learners' lexical guessing. Thus it is a meaningful question to raise how these two factors influence lexical guessing in an EFL context.

Thus, this study aims to address a research gap by investigating the effects of both word density and topic familiarity on lexical guessing in reading L2 texts. The present study will be different from previous studies to the extent that it will proceed in a controlled situation, focusing on two major factors in lexical guessing. Using quantitative data, it will examine how EFL college learners infer unknown words depending on both word density and topic familiarity in given texts. It will suggest the effects of the two factors and their interaction on lexical guessing in an EFL context using
college-level advanced learners.

### 1.3 Research Questions

The research questions in this study are as follows:

1. Does word density have an influence on Korean EFL college learners' lexical guessing?
2. Does the topic familiarity have an influence on Korean EFL college learners' lexical guessing?
3. Do both word density and topic familiarity have an interaction effect on Korean EFL college learners' lexical guessing?

The answers to these three research questions may help us better understand L2 lexical guessing and the effects of a text-related factor, such as word density and a reader-related factor, such as topic familiarity, on the lexical guessing process in an EFL context.

### 1.4 Organization of the Thesis

The present thesis consists of five chapters. This chapter overviews the study's background, which leads the research, and shows the research questions. Chapter 2 examines the theoretical background of the previous research that inspires the research issues in this thesis. It also summarizes some of the most important findings from empirical research studies on lexical guessing in L2. It reviews previous studies which are about word density and topic familiarity. Chapter 3 explains the research design, participants, material development, and detailed procedures for collecting and analyzing data. In Chapter 4, key findings from data analysis are suggested regarding research questions and deliver discussion for each research question. It contains a critical interpretation of the results in terms of the research questions. Chapter 5 summarizes the study's findings and provides the study's pedagogical, research implications, and limitations.

## CHAPTER 2.

## LITERATURE REVIEW

This chapter reviews the previous research relevant to lexical guessing, topic familiarity, and word density. It also suggests a summarization of each factor focused on in the current study. Section 2.1 defines lexical guessing and explains its importance in second-language learning. Section 2.1.1 shows studies about lexical guessing focusing on the L2 context. Section 2.2 describes several knowledge sources used in lexical guessing. Section 2.3 suggests the factors which affect lexical guessing. It can be subcategorized into two factors: reader-related factors and textrelated factors. Section 2.4 deals with word density, followed by studies about the relationship between word density and lexical guessing. Section 2.5 presents studies about topic familiarity and the relationship between topic familiarity and lexical guessing.

### 2.1 Lexical guessing

After the mid-1980s, research on lexical guessing has increased and advised students to use context cues to guess the meaning of unknown words (e.g., Clarke \& Nation, 1980; Grellet, 1998; Li, 1988; Liu \& Nation, 1985; Paribakht \& Wesche, 1999). The studies demonstrated that lexical guessing is the only method for understanding the meanings of unfamiliar words when no other resources are available. That's why guessing the words based on the context is one of the compensating strategies for L1 and L2 readers. Lexical guessing is actively utilizing the contexts; therefore, readers can identify unknown word meanings and acquire new vocabulary knowledge from lexical guessing (Jenkins, Stein, \& Wysocki, 1984). When focusing on unusual words to attempt to guess the meanings, readers can retain new word meanings much longer and expand their vocabulary. Hulstijin (1992) showed word meanings are more likely to be recalled when the readers try to guess the meanings of an unknown word by themselves using high mental effort than when the meanings are explained to them without mental effort.

Previous studies have defined lexical guessing. Haastrup (1991)
stated that lexical inferencing refers to the process of guessing the meaning of unknown words by utilizing all linguistic cues present in the text and the readers' background knowledge, linguistic knowledge, and context. Morrison (1996) defined lexical guessing as using the available linguistic cues and other essential information in a text to guess the meaning of unknown words. Nassaji(2006) confirmed that combining several knowledge sources and strategies would result in successful lexical guessing. Lexical guessing can be possible through the combination of various information sources in the text and the readers' background knowledge.

### 2.1.1 Lexical guessing of L2 learners

Lexical guessing was shown to be widely used by L2 learners when meeting unknown words (e.g., Fraser, 1999; Haastrup, 1991; Harley \& Hart, 2000; Morrison, 1996; Nassaji, 2006; Paribakht \& Wesche, 1999; Riazi \& Babaei, 2008). One of the most recommended reading strategies is lexical guessing (Coady \& Huckin, 1997). Advanced-level learners especially find lexical guessing valuable (Morrison, 1996; Fraser, 1999). Lexical guessing
in L2 can improve the accuracy and understanding of the text, and it can also lead to incidental vocabulary learning.

Since the early to mid-1980s, lexical guessing began to be studied after increasing interest in guessing. Because consulting a dictionary or inquiring someone is not always possible, numerous reading research has emphasized the importance of guessing as an alternative skill for limited vocabulary knowledge of L2 (e.g., Coady \& Nation, 1988; Haynes, 1984; Li, 1988; Liu \& Nation, 1985; Nation \& Carter, 1989). Top-down models of reading were accepted and depicted readers as guess-makers who depend heavily on contextual cues when creating the meaning of a text. The number of contextual cues can contribute to the increased success of lexical guessing. Liu and Nation (1985) and Li (1988) reported that when there were many contextual cues surrounding unknown words, readers could succeed better in lexical guessing and reduce lexical guessing mistakes.

As the research on guessing began, studies that were skeptical about the possibility of L2 learners' guessing came out. They questioned whether L2 learners would use the guessing strategy well. Cziko (1980) compared reading strategies between first and second-language French learners.

Although intermediate-level L2 learners appear to handle syntactic clues in reading, as well as L1 readers and advanced-level L2 learners, they seem less skilled at utilizing semantic and discourse cues. These differences can explain special difficulties which L2 learners meet when guessing. Bensoussan and Laufer (1984) collected students who learn English as a second language and divided them into two groups of 30 to find which condition is better for lexical guessing between the 'in isolation' group and the 'in context' group. As a result, context did not aid lexical guessing in L2 reading; it was only useful in $13 \%$ of the responses. Also, the application of 'preconceived notions' to lexical guessing is more significant than using context, which often makes mistakes. Even proficient-level readers could not use context effectively though they know more words. These studies prove the difficulties of L2 lexical guessing.

In the late-1980s, difficulties of L2 learners in lexical guessing also have been found consistently. Haynes (1984) concluded that second language learners are frequently uncertain as to whether a word is new, so they need more time to decide and can't use contextual cues as natives. Fraser (1999) found that the guessing strategy is not always a practical or
simple approach for L 2 students to use because L 2 readers tend to focus on words they already know, relying on ignoring unknown words rather than inferencing. The ability to infer meaning from context does not automatically transfer from first to second-language reading (e.g., Dunmore, 1989; Huckin, Haynes, \& Coady, 1993). Moreover, L2 readers frequently guess the wrong meanings of unknown words by misinterpreting a word, mistranslating specific morphemes, misinterpreting idioms, or mistaking the target word with one that looks or sounds similar. One of the reasons was graphemic or phonemic mismatches, which indicate differences between the word in readers' memory and the word on the page. Whether intentionally or unintentionally, L2 learners had limitations in making lexical guessing.

At the same time, despite L2 learners' difficulties in using the lexical guessing strategy well, many empirical studies have claimed the importance and necessity of lexical guessing in reading (e.g., Grellet, 1998; Li, 1988; Oxford, 1990). Also, numerous research underlined the need to teach lexical guessing as a crucial interpretation strategy. Oxford (1990) agreed that guessing the meanings of unknown words is an essential reading skill that derives meanings from context. Also, lexical guessing is crucial for
incidental vocabulary learning (e.g., Coady \& Nation, 1988; Paribakht \& Wesche, 1999). Coady and Nation (1988) have claimed that new words can be learned when readers are offered enough context, and try to guess meanings. Li (1988) found when participants feel more at ease at lexical guessing with cue-adequate sentences, they do better at remembering the meanings of unfamiliar words.

Therefore after the 2000 s, a significant interest in second language acquisition (SLA) research is the processes and development of L2 lexical guessing and the effects and interaction of several factors which influence lexical guessing. Many researchers have explored the many factors that affect lexical guessing: vocabulary knowledge, language proficiency, linguistic knowledge, contextual cues, text characteristics, attention to detail, and topic familiarity. Empirical studies of these factors that influence guessing may not only help gain insights into the nature of guessing processes but also aid in developing how to make L2 learners better at lexical guessing.

### 2.2 Knowledge sources of lexical guessing

According to numerous studies, lexical guessing is complicated since it requires numerous cognitive processes, such as analyzing, extracting, and integrating textual information with the reader's prior knowledge (Hamada, 2014). Therefore, effective lexical guessing needs a variety of processing methods and resources, including utilizing contextual meanings. During reading comprehension, the interaction between learner knowledge sources and text sources is needed to guess unfamiliar words from context. These sources impact guessing either separately or collaboratively. When learners first encounter unknown words, information only located within the context can be used, so guessing is rough and not that exact. However, after the initial information is integrated with learners' background knowledge, guessing can be more profoundly possible.

When learners derive the meanings of unknown words, they use various sources. A series of lexical guessing research tries to identify and categorize readers' knowledge sources in guessing unknown words. Huckin and Bloch (1993) showed learners used a variety of information sources and cognitive strategies in an effort to guess word meanings from context.

Therefore, research on lexical guessing has found knowledge sources that L2 learners use to guess unknown words’ meanings (e.g., Bengeleil \& Paribakht, 2004; Carton, 1971; Cai \& Lee. 2010; Fraser, 1999; Haastrup, 1991; Hu \& Nassaji, 2014; Kaivanpanash \& Alavi, 2008; Nassaji, 2003, 2006; Paribakht \& Wesche, 1999; Qian, 2004; Schmitt \& McCarthy, 1997; Wesche \& Paribakht, 2010). They have discovered and categorized the knowledge sources and contextual cues while lexical guessing. Most of the studies used a similar classification in common. Ames (1966) classified contextual cues, including syntactic and discoursal cues, expressions of language functions such as cause/effect, main idea, contrast, and so on. Schmitt and McCarthy (1997) established three types of information sources during lexical guessing, and these sources played an important role in contextual understanding. These information sources include linguistic, global, and strategic information. Kaivanpanash and Alavi (2008) discovered that learners used two-level cues containing grammatical and semantic cues and broader co-text cues beyond the sentence level.

Because it is not clear what elements are included in knowledge sources in L2 lexical guessing. A single framework is insufficient to define
knowledge sources. The current study compared the theoretical frameworks developed by Hasstrup (1991) and Bengeleil and Paribakht (2004) adapted (refer to Table 2 for more detailed information). This comparison aims to determine whether the knowledge sources for lexical guessing are different or similar between the two frameworks and choose specific sources focused on the study. Hasstrup (1991) distinguished knowledge sources into three parts: intralingual, interlingual, and contextual sources. Intralingual sources comprise target languages' components: syntax, phonology, orthography, and lexis. Interlingual sources contain target language knowledge and other language knowledge, a broader category of language information. Contextual sources are knowledge about text content, co-text, and the world.

Bengeleil and Paribakht (2004) broadly divided knowledge into two parts: linguistic sources and non-linguistic sources. Linguistic sources are subclassified knowledge sources into intralingual and interlingual sources. Intralingual sources are the information related to L2-based sources. It includes target word level, sentence level, and discourse level. When reading intralingual sources, readers can guess the meaning of an unknown term based on their understanding of the target language. However,
interlingual sources are related to L1-based sources, such as lexical knowledge and word collocation. Lexical knowledge refers to some borrowed words, and word collocation is the knowledge of words used together in L1. Non-linguistic sources include background information not directly related to linguistic information, such as knowledge of the topic and medical terms.

## TABLE 2.1

## Comparing Haastrup and Bengeleil and Paribakht's

Taxonomy of Knowledge Source in L2 Lexical Inferencing

| 1. Intralingual sources <br> a. syntax <br> b. phonology <br> c. orthography <br> d. morphology <br> e. lexis <br> f. word class <br> g. collocations <br> h. semantics <br> 2. Interlingual sources <br> a. L2 knowledge <br> b. other language knowledge <br> 3. Contextual sources <br> a. knowledge of text content <br> b. knowledge of co-text <br> c. knowledge of the world | 1. Linguistic sources <br> A. Intralingual sources <br> 1. Target word-level <br> a. word morphology <br> b. homonymy <br> c. word association <br> 2. Sentence level <br> a. sentence-meaning <br> b. syntagmatic relations <br> c. paradigmatic relations <br> d. grammar <br> e. punctuation <br> 3. Discourse level <br> a. discourse meaning <br> b. formal schemata <br> B. Interlingual sources <br> 1. Lexical knowledge <br> 2. Word collocation <br> II. Non-linguistic sources <br> A. Knowledge of topic <br> B. Knowledge of medical terms |
| :---: | :---: |

There are various opinions about what kind of information learners with different language proficiency levels mainly use when guessing. Less proficient readers are less accurate and slower in decoding, so they concentrate more on word information than context (e.g., Chen, 2018; Hamada, 2014; Nagy, 1999). According to Nagy (1999) and Chen (2018) research on a second language (L2), learners at the lower level employed morphological information more often, but learners at the advanced-level integrated morphological and contextual information when inferring unknown words.

Especially for contextual sources are critical in the process of lexical guessing in reading according to a large body of research (e.g., Bengeleil \& Paribakht, 2004; Bensoussan \& Laufer, 1984; Cai \& Lee, 2010; Carnine, Kameenui, \& Coyle, 1984; Jenkins, Stein \& Wysocki, 1984). Carnine, Kameenui, \& Coyle (1984) indicated that contextual information might be useful and essential in various ways. Readers who employ contextual cues appear to be better at guessing the meaning of unknown words as well as increasing their reading rate. Kanatlar (1995) observed predicting the meaning of unknown words using context information is the
most prevalent method. The quantity and quality of contextual information might strongly affect the accuracy of guessing. Bengeleil \& Paribakht (2004) also found participants employed contextual cues when making inferences regardless of reading proficiency. Kolahi, Alikhademi, \& Kehtari (2013) examined the usefulness of contextual cues that help to guess the meaning of unknown words and improve reading comprehension.

Some previous studies have subcategorized contextual cues into two or three cues. According to Allen (2006), contextual cues used for lexical guessing have two varieties. First, semantic/syntactic cues include contrasts, causes, sequences, examples, etc. These can aid readers in guessing unknown words in a variety of ways. Second, typographic cues consist of a glossary, pictures, bold types, etc. Cai \& Lee (2010) offered three categories of contextual clues for lexical guessing in reading comprehension: local linguistic constituent, global text representations, and world knowledge. Local linguistic constituents refer to syntactic and semantic collocation, and global text representations are about text schemas and permanent memory.

In detail, a substantial amount of prior research has identified
contextual elements that may influence the success of readers' lexical guessing, such as the availability of contextual signals and their location. Carnine, Kameenui, \& Coyle (1984) investigated the explicitness, forms, and proximity of the contextual cues affecting lexical guessing. Comparing different forms of contextual clues, students could better understand the meaning of new words when contextual signals were offered in synonyms than inference form. Also, readers could guess the correct meaning of novel words from its contextual cues, which were located in the close condition. Li (1998) indicated that a sufficient number of contextual signals could reduce the difficulty of lexical guessing. Frantzen (2003) also pointed out the essential role of contextual richness in guessing word meaning from context. Enough contextual cues can lead learners to guess the meanings of unknown words correctly. As suggested, recognizing context clues can have many advantages over other clues. The present study used nonsense words, so lexical guessing knowledge sources are based on contextual cues.

### 2.3 Factors that affect lexical guessing

Studies have investigated various factors affecting readers' lexical guessing success and failure. They have tried to discover how lexical guessing strategies function in L2 learners related to some factors and what factors affect their success or failure. Text and reader are two fundamental components of reading, so the number of factors that affect lexical guessing behavior can be divided into two categories (i.e., reader-related factors and text-related factors). They impact lexical guessing individually, and a combination of factors simultaneously affects lexical guessing.

### 2.3.1 Reader-related Factors

Several empirical research has investigated various reader-related variables, and each study considered what is the most important was different. Haastrup(1991) claimed three factors could contribute to successful lexical inferencing. Two of them were learners' factors: the learners' attention paid to the text's details and the amount of learners' basic pre-existing knowledge. Yuill \& Oakhill(1991) suggested different reasons
young learners may fail to make inferences. Children learners' poorer memory, general knowledge deficits, and having no sense of when it is appropriate to make inferences can be the reasons. Hu \& Nassaji (2014) suggested four main learner factors which affect guessing competence. They are adequate linguistic knowledge, background knowledge, intense motivation, and constant cognitive effort during the inferencing process.

Reader-related factors are concerned with the ones related to readers, such as language proficiency (e.g., Alavi \& Kaivanpanah, 2009; Bengeleil \& Parihakht, 2004; Cain, Lemmon, \& Oakhill, 2004; Cain \& Oakhill, 1999; Chen, 2018; Haastrup. 1991; Hamada, 2014; Harley \& Hart, 2000; Kaivanpanah \& Moghaddam, 2012; Lee \& Lee, 2012; Parel, 2004; Park, 2020), vocabulary knowledge (e.g., Hatami \& Tavakoli, 2012; Hu \& Nassaaji, 2014; Coady \& Huckin, 1999), linguistic knowledge (e.g., Chen, 2018; Kaivanpanah \& Alavi, 2008; Zhang \& Koda, 2012), grammatical knowledge (e.g., Alavi \& Kaivanpanah, 2009; Paribakht \& Wesche, 1999; Paribakht, 2004), background knowledge (e.g., Frantzen, 2003; Hu \& Nassaji, 2014; Kintsch, 1988; Nassaji, 2002, 2006; Siddiek \& Horiba, 1990), mental effort and memory capacity (e.g., Cain, Lemmon, \& Oakhill, 2004;

Fraser, 1999; Paribakht \& Wesche, 1999), and topic familiarity (e.g., AtefVahid, Maftoon, \& Zahedi, 2013; Darvand \& Ketabi, 2015; Hu \& Nassaji, 2014; Pulido, 2000, 2003, 2007)

Learners' language proficiency level seems important to lexical guessing (e.g., Alavi \& Kaivanpanah, 2009; Bengeleil \& Parihakht, 2004; Cain, Lemmon, \& Oakhill, 2004; Cain \& Oakhill, 1999; Chen, 2018; Hamada, 2014; Harley \& Hart, 2000; Kaivanpanah \& Moghaddam, 2012; Lee \& Lee, 2012; Liu \& Nation, 1985; Morrison, 1996; Oakhill, 1982; Parel, 2004; Park, 2020; Pulido, 2000). Much empirical research has discovered a high correlation between the language proficiency level of readers and their usage of the lexical guessing approach. High proficiency levels can positively affect very much on both the success of lexical guessing and reading comprehension. Oakhill (1982) showed less skilled readers are also poor at using inferential processing to guess the meanings of unknown words, especially when the texts are difficult and tasks are demanding. Liu and Nation (1985) pinpointed significant differences in lexical guessing based on language proficiency. It divided the subjects into two proficiency levels. Learners with high proficiency levels could correctly guess $85 \%$ to
$100 \%$ of the unknown words. However, learners with low proficiency levels guessed between $30 \%$ and $40 \%$ of the unfamiliar words. Morrison (1996) also compared high and low-proficiency participants. The study's results proved that high-proficiency learners performed better in lexical guessing as they could utilize contextual cues more and combine various knowledge sources well. It does not mean that low-proficiency learners didn't use information sources. They also take advantage of contextual cues but are less than high-proficiency learners. Pulido (2000) and Lee \& Lee (2012) claimed that L2 proficiency levels affect text processing and comprehension. During the guessing process, advanced L2 learners could exploit many language signals, including syntactic, semantic, lexical, and stylistic cues, and they changed their guessing behavior appropriately. Hamada (2014) compared beginning-level and advanced-level learners guessing processes. Though the morphological meanings were not correct enough, beginninglevel learners depend more on morphological information. Chen (2018) suggested threshold effects of language proficiency on lexical guessing. Insufficient linguistic knowledge (i.e., morphological awareness) and experiences prevent less-skilled learners from identifying, analyzing, and
manipulating contextual clues, hindering the use of cues to generate appropriate guessing.

However, there has also been research that showed the opposite results: the result of lexical guessing is not much different depending on the language proficiency (e.g., Bengeleil \& Paribakht, 2004; Bensoussan \& Haastrup, 1991; Kaivanpanah \& Moghaddam, 2012; Laufer, 1984). Bensoussan \& Laufer (1984) investigated the extent to which more readingskilled students use context more efficiently in guessing unknown words than less reading-skilled students. To prove this, the 60 participants were divided into three groups: the top 20 , middle 20 , and bottom 20 . Contrary to predictions, the study's findings show no significant differences in lexical guessing 'in context' between the groups. In this case, the higher readingskilled students' better lexical guessing performances were attributed to their prior vocabulary knowledge rather than their language proficiency. Also, Haastrup's (1991) findings showed that both higher- and lowerproficiency L2 learner groups make nearly equal use of contextual cues, which were the primary knowledge sources utilized by both groups. Kim (2010) showed both passage-sight vocabulary knowledge and reading
ability did not significantly influence lexical guessing, especially for lowlevel L2 participants who experienced the threshold level for successful guessing. Kaivanpanah \& Moghaddam (2012) discovered that more proficient readers performed better at lexical guessing tasks. However, the findings also showed that regardless of their level of reading ability, all participants used the same knowledge sources, such as local cues and global cues when guessing. In conclusion, some studies suggest excellent and poor students are not that different in lexical guessing ability.

According to some research, L2 vocabulary knowledge appears to be one of the most important elements influencing learners' lexical guessing (e.g., Barnett, 1989; Coady \& Huckin, 1999; Ehsanzadeh, 2012, 2020; Hatami \& Tavakoli, 2012; Laufer, 1997; Morrison, 1996; Nassaji, 2004, 2006). When learners meet new words, it is difficult for them to use contextual cues if the clues surrounding new words are novel to them. A lack of vocabulary knowledge might determine the success of guessing. Haynes (1984) showed along with the differences in L1 and L2 language systems, the limited vocabulary knowledge of lower-level learners could hinder the capacity to make appropriate lexical guessing. Laufer's (1997)
lexical threshold demonstrated that a lack of vocabulary knowledge might substantially impair the capacity to guess new words accurately, impeding reading comprehension. Nassaji (2004) investigated the link between ESL learners' depth of vocabulary knowledge and their performance in deriving word meanings from context. Participants were divided into lexically proficient and less proficient learners, and the results showed that the more substantial depth of vocabulary knowledge, the better they did at guessing unknown words. The depth of vocabulary knowledge greatly mediates the effectiveness of lexical guessing. Ehsanzadeh (2012) and Hatami and Tavakoli (2012) also found both breadth and depth of vocabulary knowledge linked positively with lexical guessing success through reading. The depth of vocabulary knowledge was a better predictor of guessing success. Moreover, breadth and depth of vocabulary knowledge affect long-term retention of guessed word meanings. In the following study (Ehsanzadeh, 2020), results indicated the significant effects of the depth of vocabulary knowledge on L2 incidental learning.

Studies have suggested that grammatical knowledge significantly influences lexical guessing (e.g., Haastrupm 1991; Kaivanpanah \& Alavi,

2008; Paribakht, 2004; Paribakht \& Wesche, 1999). Haastrup (1991) highlighted that the combination between learners' general knowledge, awareness of context, and linguistic knowledge, such as grammatical knowledge, affects lexical guessing. Paribakht (2004) showed the important role of grammatical knowledge in the lexical processing of a second language rather than background knowledge. Grammatical knowledge of ESL learners can aid in guessing the meanings of unknown words when reading, which may lead to the further acquisition of L2 vocabulary.

Other research showed background knowledge must play an important role in successful guessing (e.g., Grabe, 2004; Kintsch, 1988; Nassaji, 2002; Siddiek \& Horiba, 1990). Greater levels of background knowledge contribute to the effectiveness of attentional allocation to input during reading, allowing for richer textual interpretations and more accurate lexical guessing. Prior knowledge can come from experience or information about each reader's people, culture, and the universe. Appropriate use of language knowledge and background information is required for effective guessing because it offers a conceptual framework that assists in guessing textual meaning. In other words, learners who failed to construct cohesive
schemata produced more incorrect guessing. As a result, background knowledge will be crucial for readers to guess unknown words. Siddiek \& Horiba (1990) discovered that L2 learners guess the meaning of novel words by activating background knowledge. The results showed that learners rely on background knowledge to compensate for limited comprehension, which contributes to increasing text comprehension and guessing. According to Grabe (2004), background knowledge clarifies lexical meanings and syntactic ambiguities, making it essential for guessing. Alfak (2013) also investigated the function of activating background knowledge. Readers who have prior knowledge and interact well with the text are likely to do better on reading comprehension tests than those who do not. It is necessary to bring out background knowledge, what readers already know about a text before reading. Hu and Nassaji (2014) suggested what differentiates between successful and less successful guessing in L2 learners. Selfawareness and involvement related to background knowledge are needed to successful guess. From qualitative analysis, successful guessing frequently requires a larger conceptual framework by effectively using prior knowledge. Background knowledge was utilized in guessing the meanings of new words,
regardless of learners' L1 language or language proficiency levels.

Other studies asserted that an individual's ability to infer new word meanings from context is connected to their mental effort and memory capacity (e.g., Cain, Lemmon, \& Oakhill, 2004; Daneman \& Green, 1986; Fraser, 1999; Paribakht \& Wesche, 1999). Daneman \& Green (1986) suggested that increasing the distance between the different information to be integrated raises the reader's processing demands. According to them, this will prompt learners with limited memory capacity challenging to guess. In other words, the long distance between information has a negative impact on learners' capacity to identify contradictions, guess, and infer new words' meanings using context. Usually, less skilled learners have smaller working memory than more skilled learners, leading to their difficulties with the guessing process. Fraser (1999) claimed that the higher the mental effort is needed in processing a text, the greater the possibility of guessing. Therefore, higher attentiveness and prolonged processing are required to improve guessing. Cain, Lemmon, and Oakhill (2004) also investigated the relationship between working memory capacity and the guessing ability of children. Two different experiments were conducted. The first study proved
that children with weak vocabulary knowledge and poor reading comprehension abilities were less able to guess the meanings of novel vocabulary from context. The second study showed less proficient readers might have memory limitations, and they could be a reason for poor performance on the lexical guessing task, which needs high processing demand.

### 2.3.2 Text-related Factors

Textual factors are concerned with the factors related to text, such as text characteristics (e.g., Cooter \& Flynt, 1996; Frantzen, 2003; Lee \& Lee, 2012; Paribakht \& Wesche, 1999; Shen, 2018; Young, 1999), the explicitness and amount of contextual cues (e.g., Centinavci, 2014; Haynes, 1993; Kaivanpanah \& Rahimi, 2017; Liu \& Nation, 1985; Moran, 1991; Paribakht \& Wesche, 1997), the location of contextual cues, the characteristics of a word (e.g., Carnine, Kameenui, \& Coyle, 1984; Frantzen, 2003; Hu \& Nation, 2000) and word density (e.g., Hirsh \& Nation, 1992; Hu \& Nation, 2000; Johns, 1980; Laufer, 1997; Neufeld \& Webb, 1981).

Some research has investigated the relationship between the text characteristics and the usage of the lexical guessing strategy. Text characteristics include text structure, text difficulty, and text genre (e.g., Cooter \& Flynt, 1996; Frantzen, 2003; Lee \& Lee, 2012; Paribakht \& Wesche, 1999; Shen, 2018; Strenberg, 1987; Young, 1999). Text structure affects the capacity to guess the meaning of unfamiliar words because a difficult text, such as long words and sentences, might contribute to the complexity of a text and reduce readers' motivation to utilize contextual cues (Strenberg, 1987). Cooter and Flynt (1996) and Young (1999) found text structures linguistically challenge English language learners. Unlike explanatory literature, narrative texts are usually simple, enabling readers to understand better and guess. Lee and Lee (2012) examined the impact of text genre on lexical guessing strategy. Lexical guessing task was given in the expository and narrative text, respectively. In the expository text, the strategy using background knowledge had the highest success rate. In the narrative text, the strategy of analyzing the morpheme of the target vocabulary was the highest. Shen (2018) also tried to determine if text genre (i.e., expository vs. narrative) impacts EFL learners' lexical guessing. The
quantitative analyses revealed that the text genres substantially impacted the lexical guessing of EFL learners, and learners did better with narrative texts than explanatory texts.

Other research has revealed that the amount and explicitness of contextual cues are crucial to the process and success of lexical guessing in reading (e.g., Centinavci, 2014; Haynes, 1993; Liu \& Nation, 1985; Moran, 1991; Paribakht \& Sternberg \& Powell, 1983; Wesche, 1997). Sternberg and Powell (1983) emphasized the number of contextual cues, how many times the word appears in a text, how important the word to be inferred is in the text, and whether the context has provided sufficient hints for lexical guessing. Haynes (1984) suggested ESL readers are already successful guessers when given enough contextual cues, yet these findings also emphasize the necessity for teaching how to use contextual cues well in guessing. Cetinavci (2014) also showed contextual richness plays a crucial role in L2 learners' guessing word meanings from context. Those who guessed word meanings from a rich context performed better than those from a poor context because of the explicitness and clearness of cues.

Lastly, it is demonstrated that the characteristics of target words to
be guessed also influence lexical guessing (e.g., Frantzen, 2003; Hu \& Nation, 2000). Following a similar conclusion from Rodgers (1969), Na \& Nation (1985) claimed verbs are the easiest ones to guess, followed by nouns, adverbs, and adjectives. Both found that word factors such as the part of speech can affect vocabulary learning and guessing meanings. According to Frantzen (2003), the appearance of a word, such as the length of words, might have a more significant impact on guessing ability than contextual clues.

### 2.4 Word density and L2 lexical guessing

So far, in many studies, it has been revealed that the amount of vocabulary knowledge will significantly affect learners' guessing ability. In the same perspective, many researchers suggested that the density of new words greatly influence lexical guessing (e.g., Hirsh \& Nation, 1992; Hu \& Laufer, 1997; Nation, 2000; Sternberg et al, 1983; Wesche \& Paribakht, 2010). How much vocabulary a second language learner needs in order to read with adequate comprehension is investigated. One approach for doing
this is to find out level of the density of unknown vocabulary.

## TABLE 2.2

## Text Coverage and Word Density

| Text coverage | Density of unfamiliar in <br> familiar words | Number of text lines <br> per 1 unfamiliar word |
| :---: | :---: | :---: |
| 99 | 1 in 100 | 10 |
| 98 | 1 in 50 | 5 |
| 97 | 1 in 33 | 3.3 |
| 96 | 1 in 25 | 2.5 |
| 95 | 1 in 20 | 2 |
| 90 | 1 in 10 | 1 |

Word density can be defined as the number of unfamiliar words per 100 tokens. As Table 2.2 suggested, if learners have $98 \%$ text coverage, then one of every fifty words is likely to be unknown. Also, five lines contain one unknown word. However, if learners have $95 \%$ text coverage, then one of every twenty words is likely to be unknown. Two lines include one
unknown word. The most important thing from Table 2.2 is that a very small percentage change in coverage can significantly change the density of unknown words (Keshavarz \& Mohammadi, 2009). Liu and Nation (1985) showed that the ratio of unfamiliar words to familiar words in reading passages, called word density, greatly affected how well readers guessed what the words meant. The passage with fewer new words, which is a higher word density, was much better at lexical guessing than the one with many new words, which is a lower word density.

It has long been understood that to guess the meanings of unfamiliar words from context, the learner must understand surrounding words. When learners come across new words, it might be difficult for them to make use of contextual clues if the clues are novel to them as well. However, if the word density is lowered and most words surrounding new words are clear, reading comprehension is higher, and guessing becomes more accurate. Sternberg et al. (1983) showed that word density is the mediating variable that connects knowledge sources and lexical guessing. In other words, different unknown word to known word densities affect guessing from context a lot. Keshavarz \& Mohammadi (2009) compared the lower-density
and higher-density passages divided into five variable formats; intact text, $2 \%, 5 \%, 10 \%$, and $20 \%$ density. The density of unknown words strongly impacted the readers' reading comprehension, and the passage with a lower density showed a clear understanding.

Also, there has long been investigation over precise word density threshold which distinguishes between successful and failed reading comprehension and lexical guessing (e.g., Chegeni \& Tababaei, 2014; Hirsh \& Nation, 1992; Hsueh-Chao \& Nation, 2000; Johns, 1980; Wesche \& Paribakht, 2010). Johns (1980) showed that when students come across a text with a high density of new words, it may lead to difficulty guessing the correct meaning. The 'threshold effect' arises when there are more than 50 unfamiliar words per 1000 words. In this situation, guessing will be blocked due to insufficient context that readers can use. Chegeni and Tababaei (2014) explored the effect of the number of unknown words and word density on lexical guessing. For this purpose, students with the same English proficiency level were selected, and their lexical guessing performance was compared in two different word density levels: twenty unknown words in the total 357 -word text and ten new words in 291 word-density text. This
research showed the significant impact of word density on the success of learners' lexical guessing. Fewer unknown words were interpreted as having more clues that participants could use to infer the correct meaning of those words. In other words, the fewer the unfamiliar vocabulary, the more available cues for participants to utilize in guessing the meaning of those words correctly. The outcomes of studies demonstrated that word density influences both reading comprehension and the lexical guessing success of L2 learners.

Investigating the passage sight vocabulary is one of the approaches for determining how the density of unknown vocabulary and vocabulary size are associated with guessing in various types of texts. Word density and passage sight vocabulary are both related to vocabulary knowledge, but they are a little bit different in that word density focuses on the text, while passage sight vocabulary focuses on the reader. Passage sight vocabulary can be defined as the knowledge of forms and meanings of words and recognized automatically by readers, irrespective of context (Pulido, 2000, 2007). Previous research investigated passage sight vocabulary and L2 lexical guessing and found passage sight vocabulary can ultimately improve
the success of lexical guessing (e.g., Atef-Vahid, Maftoon, \& Zahedi, 2013; Haynes, 1993; Hirsh \& Nation, 1992; Laufer, 1997; Pulido, 2007). Pulido (2007) reported a positive relationship between lexical guessing and passage sight vocabulary. Readers with efficient decoding skills and high passage sight vocabulary may distribute their attention more effectively to integrate ideas from context, having fewer constraints on memory. This increases the likelihood that learners could use background knowledge and the possibility of effective lexical guessing. Also, passage sight vocabulary can affect the ease/difficulty of lexical guessing and retention of target word meanings. According to the findings of Atef-Vahid, Maftoon \& Zahedi (2013), learners with higher levels of passage sight vocabulary reported better ease in inferring the target words. The findings consistently showed as one's passage sight vocabulary grew, so did one's ability to infer target word meanings correctly. When the effects of passage sight vocabulary and topic familiarity on lexical guessing were compared, participants complemented their insufficient background knowledge using acquired vocabulary, passage sight vocabulary.

One point that is still controversial is how the amount and extent of
word density can affect lexical guessing. In other words, it is ambiguous to which extent word density level makes the difference in lexical guessing. In fact, what is the optimal density coverage level is not clear yet. Even though a consistent linear link between word density and lexical guessing has been proved, there isn't a clear guideline for the ideal density of unknown terms. What is a word density threshold that works as the boundary between successful and unsuccessful lexical guessing needs more discussion. Laufer and $\operatorname{Sim}$ (1985) found that the group above $95 \%$ on the vocabulary coverage had a significantly higher number of successful lexical guessing than those scoring below $95 \%$. It is thought that if an L2 reader can cover at least 95 percent of the words, they can understand most of the written content and guess the unknown words correctly. According to Keshavarz \& Mohammadi (2009), there was no significant difference between $0 \%$ and $2 \%$ word density. This indicated $5 \%$ density was the threshold, suggesting below $5 \%$ density, no discernible impact on the participants' reading comprehension could be noticed.

However, Hirsh and Nation (1992) imply that the 98 percent coverage can aid the reader in understanding the written text without any
support. According to Hu and Nation (2000), if EFL/ESL readers can understand $98 \%$ of word density, they can comprehend texts without assistance. A 98-99 percent vocabulary knowledge level is required for reading comprehension. Hsueh-Chao and Nation (2014) showed readers could comprehend the text adequately when $90 \%$ and $95 \%$ of the word coverage was, but most readers felt it was challenging to do so. A simple regression analysis of the data revealed that it is necessary for learners to gain complete and unassisted comprehension with $98 \%$ of the word coverage. On the other hand, Schmitt, Jiang, and Grabe (2011) recently argued against any vocabulary knowledge thresholds. They discovered no obvious lexical point at which when reading comprehension rises considerably. Considering each study has a different range of word density, there are almost few studies that compare L1 context and L2 context in terms of lexical coverage and comprehension, so further research is needed.

### 2.5 Topic Familiarity and L2 lexical guessing

There is strong evidence that the higher the levels of topic
familiarity are, the richer the textual comprehension with the availability of schemata (e.g., Alptekin \& Erçetin, 2011; Leeser, 2007; Ozuru, Dempsey \& McNamara, 2009). If the paragraph topic is familiar but contains unfamiliar words or syntax occasionally, the reader will utilize the meaning of the general context to complement the knowledge and comprehend the text. Having previous information related to the text topic may assist learners in directing their attention more efficiently, contributing to better understanding.

In addition to topic familiarity potentially improving reading comprehension, research demonstrates that learners' background knowledge might facilitate guessing word meaning while reading. The relationship between a reader's ability to guess the meanings of new words and their topic familiarity has been proved (e.g., Atef-Vahid, Maftoon, \& Zahedi, 2013; Carrel, 1983; Darvand \& Ketabi, 2015; Kaivanpanash \& Rahimi, 2017; Kim, 2010; Liu \& Nation, 1985; Leeser, 2007; Pulido, 2004, 2007). A series of empirical studies have found topic familiarity can contribute to guessing the meanings of unknown words. L2 readers utilize background information to guess meaning through reading. In Adams's (1982) study, it
was demonstrated that when L2 learners were knowledgeable about the topic of a text, they performed better in lexical guessing. Pulido (2007) proved the strong impacts of topic familiarity on lexical guessing. It showed that L2 Spanish learners were more successful at guessing the meanings of unknown words when the texts were familiar to them compared to the unfamiliar ones.

Furthermore, topic familiarity can affect vocabulary learning too. Several studies proved the effects of topic familiarity on incidental vocabulary gain (e.g., Haynes, 1993; Kaivanpanah \& Rahimi, 2017; Pulido, 1999; Pulido, 2003; Pulido, 2004; Rott, 2000). Pulido (1999) depicted significant effects of topic familiarity on vocabulary acquisition. Memorizing new vocabulary was better when Spanish L2 learners read culturally familiar texts instead of unfamiliar texts. Rott (2000) also found better recall of target word meanings when learners inferred the meanings based on prior knowledge related to the topic. Pulido (2003, 2004) demonstrated the facilitative effects of topic familiarity on the immediate vocabulary retention of L2 learners. According to Kaivanpanah and Rahimi (2017), readers can remember those inferred words well if they strongly
associate target words and context. Words with familiar topic texts had a higher chance of being remembered than words with unfamiliar texts. Therefore, activating and using content-related information leads to incidental vocabulary learning and increasing retention.

Some studies did not simply investigate the relationship between lexical guessing and topic familiarity but also find out the relationship with a third factor, such as passage sight vocabulary, reading proficiency, and retention (e.g., Atef-Vahid, Maftoo, \& Zahedi, 2013; Darvand \& Ketabi; Pulido, 2003; Pulido, 2000). Pulido (2000) tried to seek out the impact of reader-based factors: L2 reading proficiency, passage sight vocabulary, and familiarity with incidental vocabulary gain. By guessing the meaning of unknown words, new vocabulary knowledge was obtained. Especially gains were greater when students read familiar texts than less familiar ones. AtefVahid, Maftoon, and Zahedi (2013) investigated the effects of topic familiarity and passage sight vocabulary on L2 lexical inferencing of Iran undergraduate students. Topic familiarity strongly impacts lexical guessing because the greater background knowledge, the richer interpretations in comprehension of text meaning. Darvand and Ketabi (2015) revealed that
plot familiarity positively affects lexical guessing, ease, and retention. Thirty-eight learners showed more correct guesses, considered guessing easier, and did a better-memorizing performance in familiar-plot stories.

However, in some research, background knowledge about the topic had mixed effects on perceived ease or difficulty guessing. Few studies discovered that learners depend on background knowledge, but it is sometimes relatively different. Readers reacted differently to topic familiarity when variables such as passage sight vocabulary and language proficiency level made a significant impact. Carrell (1983) compared native, advanced non-native, and non-native intermediate learners to find out the effect of background knowledge on reading comprehension. The results showed natives seem to have a good sense of utilizing context or textual clues even though they feel unfamiliar with the text topic. L2 learners misuse background knowledge even when they feel familiar with the topic. It means only natives use background information well so that topic familiarity can make different effects according to naiveness. Rott (2000) observed only a small number of German learners at the intermediate level applied their background knowledge during guessing. Therefore more
research must be needed.

This chapter has reviewed literature concerned with research. The literature about lexical guessing was suggested with a particular focus on its definition and importance in L2 reading. The knowledge sources used in lexical guessing were identified. Various factors affecting the success of lexical guessing were classified as reader-related and text-related factors. Among them, topic familiarity and word density were focused on. Empirical studies that investigated the relationship between them were reviewed and showed two factors' significant effects on L2 lexical guessing.

This study uses a quantitative method to compare different topic familiarity and word density levels regarding lexical guessing. Three key research questions were mentioned earlier, and their answers will be suggested in the following parts.

## Chapter 3.

## METHODOLOGY

This chapter presents the method used in this study. Section 3.1 shows the research design, and the participants are discussed in Section 3.2. Section 3.3 gives information on instruments, including selected texts, a lexical guessing task, and a topic familiarity questionnaire. In Section 3.4, the detailed procedure is described. The data analysis is outlined in Section 3.5.

### 3.1 Research Design

The study was conducted with a $2 \times 2$ repeated-measures design. The participants should conduct the lexical guessing tasks and topic familiarity questionnaire under four different texts - $98 \%$ familiar, $98 \%$ unfamiliar, $95 \%$ familiar, and $95 \%$ unfamiliar (Table 3.1). There are two independent variables: 1) Word density ( $98 \%$ and $95 \%$ ) and 2 ) Topic familiarity (familiar and unfamiliar). The dependent variable was lexical
guessing.

The combination of a different option of two independent variables (word density and topic familiarity) was assigned crosswise (see Table 3.2). This experimental design was chosen to control variability between texts that might arise, which has greater statistical power. Among the four texts, two texts' topics are related to biology (text 1 and 2 ), and the other texts are related to economics (text 3 and 4). Two options were assigned to the participants who major in biotechnology or medical science; 1) $98 \%$ familiar (Text 1), 95\% familiar (Text 2), 98\% unfamiliar (Text 3), 95\% unfamiliar (Text 4), 2) 95\% familiar (Text 1), $98 \%$ familiar (Text 2), $95 \%$ unfamiliar (Text 3), 98\% unfamiliar (Text 4). The other two options were assigned to the participants who major in business administration or economics; 1) $98 \%$ familiar (Text 3), $95 \%$ familiar (Text 4), $98 \%$ unfamiliar (Text 1), $95 \%$ unfamiliar (Text 2), 2) $95 \%$ familiar (Text 3), $98 \%$ familiar (Text 4), $95 \%$ unfamiliar (Text 1), $98 \%$ unfamiliar (Text 2).

## TABLE 3.1 Experimental Design of the Study

$$
\mathrm{N}=58
$$

|  |  | $\mathrm{N}=58$ |
| :---: | :---: | :---: |
|  | Word density $98 \%$ | Word density $95 \%$ |
| Topic familiarity | Combination A | Combination B |
|  | $\mathrm{N}=58$ | $\mathrm{~N}=58$ |
| Topic unfamiliarity | Combination C | Combination D |
|  | $\mathrm{N}=58$ | $\mathrm{~N}=58$ |

## TABLE 3.2 Detailed Experimental Design of the Study

|  |  |  | $\mathrm{N}=58$ |  |
| :--- | :---: | :---: | :---: | :---: |
|  | Text 1 <br> Bacteria <br> Evolution | Text 2 <br> Stem cells <br> therapy | Text 3 <br> Exchange <br> rate <br> currency | Text 4 <br> Low-balling <br> Price |
| Participant 1 | A | B | C | D |
| Participant 2 | B | A | D | C |
| participant 3 | A | B | C | D |
| Participant 4 | B | A | D | C |

Participant 25
A
B
C
D
Participant 26
B
A D
C
Participant 27
C
D
A
Participant 28
D
C
B
A
participant 29
C
D
A
B
Participant 30
D
C
B
A
Participant 57
C
D
A
B
Participant 58
D
C
B
A

Note. Participants 1-26: majoring in biotechnology or medical science, Participants 27-58: majoring in business administration or economics

### 3.2 Participants

There were 58 Korean L2 college students in the study. Each of them studied economics or biology major at various Korean universities, aged over 20 years. The one group familiar with economic texts belonged to the college of business administration or economics. The other group
familiar with biology texts belonged to the college of biotechnology or medical science. The number of participants who majored in business administration or economics was 32 , and the other participants who majored in biotechnology or medical science were 26 . Some of them who were undergraduate students was 56 , but others, 2 were graduate students. Participants were recruited either online or offline. They were only qualified if TEPS, TOEIC, and TOEFL certification scores were acquired within two years.

The official English assessment score (e.g., TOEIC, TOEFL, and TEPS) was used to ensure the participants had a similar level of English proficiency. Participants with grades $2 \sim 2+(327-452$ points $)$ were recruited based on the grade table presented by TEPS. This level can be considered a foreigner with intermediate and upper-intermediate English skills. Participants who didn't have TEPS scores were replaced with official certified English scores of 835 to 960 points in TOEIC and 96 to 114 points in TOFFL, based on the conversion table presented on the TEPS official website.

To control the variable of topic familiarity, among those who met
the English proficiency level, the major of participants were identified in the submission form when recruiting. Then, a 5-item Likert scale topic familiarity questionnaire related to the topics of the four texts was administered to all participants to assess their prior knowledge of the story's topic. It was an adapted version of previous research (Pulido, 2000). Participants rated their familiarity with four text-related keywords on a scale from 1 to 5 . In order to confirm the difference in topic familiarity between participant groups (i.e., participants majoring in biotechnology or medical science and participants majoring in business administration or economics), an independent paired t-test was used. The findings indicated the participants' topic familiarity is significantly different between the two groups ( $\mathrm{p}<.001$ ).

### 3.3 Instruments

This study used four texts and employed two instruments: (1) a task that investigates learners' lexical guessing and (2) a topic familiarity questionnaire.

### 3.3.1 Selection of the four Texts

The four texts used in the study were from an English college scholastic ability test (CSAT hereafter) and a mock CSAT for tenth grade. Each passage consists of 150 words on average. These tests were made to evaluate the reading ability of Korean high school students. Authentic sources, including journal articles, technical research reports, and professional literature, are used for this test. The length of the original paragraphs may be between 150 and 200 words.

Among the chosen texts, two texts are related to biology, and the other two texts are related to economics: two biology texts are related to bacteria or stem cells. The other two economics texts were related to either exchange rates or pricing. Except for the target vocabulary, the difficult words were replaced by easier words or modified according to the purpose of the experiment. The four texts' genre was restricted to an expository text. Also, these texts were similar with respect to authenticity, linguistic difficulty, length, and average sentence length. To make the four texts similar, texts were transformed and analyzed. The Flesch-Kincaid Grade level was used to ensure that the four texts were similar in terms of
readability. These measures can be used to compare the readability of texts. Also, words that are too long or academically difficult were replaced by more common words.

## Example 1:

There are only one types of molecule that your body ever repairs, and that's your DNA. (original)

There is only one type of molecule that your body ever repairs, DNA. (modified)

## Example 2:

Presumably, the willingness to postpone purchases into the future is a function of the reward. (original)

Presumably, the willingness to delay purchases into the future is a function of the reward. (modified)

In Example 1, the sentence length of the modified text was shorter than that of the original text, and the level of words/sentence was lowered by making the sentence simpler. As Example 2 showed, the word 'postpone' was in the 5000 level in the Oxford vocabulary list. However, the word ‘delay' with a similar meaning is at the level of 3000 in the list. The word
'delay' has a shorter word length and is familiar to learners with both a lower and a higher level. The four texts used in the experiment were modified similarly, as shown in the two examples. Table 3.2 display the overall characteristics of the four texts.

## TABLE 3.3

## Descriptive Information above the Four Texts Used in the Study

|  | Text 1 | Text 2 | Text 3 | Text 3 |
| :---: | :---: | :---: | :---: | :---: |
|  | Bacteria <br> Evolution | Stem cells <br> therapy | Exchange <br> rate <br> currency | Low-balling <br> Price |
| Words | 236 | 212 | 235 | 240 |
| Sentences | 11 | 10 | 11 | 9 |
| Words / <br> Sentence | 21.2 | 21.2 | 21.4 | 22.7 |
| Flesch- <br> Kincaid <br> Grade Level | 12.7 | 12.7 | 13 | 13.7 |
| Flesch- <br> Reading <br> Ease Score | 41.5 | 41.5 | 39 | 40.7 |

Before the main experiment, pilot research was carried out to check the suitability of passages and the method. Six university students were sampled for the pilot test to ensure the pilot sample's similarity to the main study. Three students were biology majors, and the others were economics majors. All of them had the same English proficiency levels, which are intermediate and upper-intermediate levels, TOEFL or TEPS.

First, the topic familiarity test was conducted to measure the learners' familiarity with four different passages. The test results were used to determine the appropriateness of reading materials for a lexical guessing task. Second, a lexical guessing task was conducted, which was created differently based on word density and topic familiarity. Participants were instructed to put down their synonyms in English or Korean. As a result, the more familiar the text topic and the higher the word density, the more accurate the answers were.

### 3.3.2 Lexical Guessing Task

Except for the target words that the participants were required to
guess, vocabulary lists along with the meanings were made and then distributed to the participants. Through the list, the participants could compensate for their lack of vocabulary knowledge so that there are no unknown words except for the target words. Ten words were chosen as target words in $95 \%$ of word-density passages, and four were selected in $98 \%$ of word-density passages. It means that $95 \%$ of word-density passages had ten unknown words, whereas $98 \%$ of word-density passages had four unknown words.

Target words were highlighted in bold throughout the text. Since the experiment's primary purpose was to find out whether these college-level EFL learners could guess the target words appropriately in various conditions, target words were replaced with nonsense words so that all participants could guess the meanings in the same condition in which nobody has prior knowledge of the target words. These nonsense words were constructed according to orthographical and morphological rules in the English nonsense word list. These nonsense words were almost the same length as that of the words they replaced.

Additionally, several criteria applied for selecting the target words
for lexical inference are as follows. First, all words were content words. These words are meaningful keywords in the text. Moreover, according to Na \& Nation (1985), verbs are the easiest to guess, followed by nouns, adverbs, and adjectives. Therefore, of the twenty target words from the four texts, nine were nouns, six were verbs, and the remaining one was an adjective. Second, there were enough contextual clues to guess the meanings of the words. Additionally, the target words are appropriately placed in a paragraph, and two target words cannot appear simultaneously in one sentence. The target words were scattered evenly in the paragraphs, and no two target words appeared in the same phrase, which would give enough contextual cues for the target words. It also helped manage the density level across the text.

Participants were asked to write meanings or translations of target words in the form of bold and underlined nonsense words to examine how they guessed these unknown words (see Appendix 1). The participants were instructed as follows. 'You are going to read four texts. Read the passage carefully, at least twice at your own pace. Then you should infer the meanings of the bold words as much as possible and describe their
meanings either in Korean or English. If you cannot guess the exact meaning of the target word, you can explain the meaning of the word in Korean. If you can't guess the meaning, just write 'I don't know.' These instructions were given in a written form. Participants had to infer ten nonsense words in two passages and four nonsense words in two passages, so, in total, they had to guess the 28 underlined English words in Korean. For lexical guessing, the following scoring criteria were applied. Wrong reasoning $=0 ;$ Partially correct in context $=1 ;$ Correct $=2($ a correct word meaning in English or Korean is provided, or a correct explanation or definition is provided).

### 3.3.3 Topic Familiarity Questionnaire

The topic familiarity questionnaire aims to ascertain participants' familiarity with the content of text passages. It also provides information on participants' background knowledge. In other words, it will check how familiar participants are with the topic of the texts and whether there is any relevant past background knowledge. The topic familiarity of the four texts
was assessed by a 5-point Likert scale (see Appendix 2). Five items per each passage were prepared to examine how familiar each passage was to the participants. Participants checked their familiarity with each topic corresponding to the four passages, so in total, they had to answer 20 questions. This questionnaire is adapted and modified from the questionnaire used in the study of Pulido (2007). Study participants ranked topic familiarity survey questions on a 5-point Likert scale according to the familiarity: strongly don't feel familiar, don't feel familiar, neutral, familiar, strongly familiar.

Reliability analyses were conducted to check the topic familiarity questionnaire's internal consistency. Cronbach's Alpha was used for computing the test reliability. Reliability coefficients for the four texts of topic familiarity were 0.973 for text $1,0.969$ for text $2,0.963$ for text 3 , and 0.978 for text 4 . All of them can be considered reliable for the study.

### 3.4 Procedure

Even though this experiment was planned to proceed in an offline
environment, the Covid situation was severe. Therefore it was difficult for the experiment to be conducted face-to-face, so the experiment was conducted remotely online. The survey and experiment implementation methods were all the same except for the difference in location. All inspection tools were created in digital form using Google Forms so that research participants could perform tasks using mobile or computer. After a thorough simulation, the research participants could easily understand and perform the task type converted into a digital form, which would be explained in detail before the experiment.

Over a week, data was collected online. In a week, participants arranged a schedule. On time, they listened to a detailed explanation of the study and got a topic familiarity questionnaire and lexical guessing task online. They first answered a topic familiarity questionnaire in 5 minutes. Participants responded to their level of topic familiarity through five items per each passage on a 5-point Likert scale. In the following session, the lexical guessing task was finished by most participants in 40 minutes. The recommended time is around 1 hour, but there was no official time limit, so participants could use enough time to reread the texts. They were instructed
to read the texts carefully for comprehension and to guess the meanings of the target words. The participants would read each text as their reading face to ensure understanding and guessing. After reading each piece, participants would be required to write exact L 1 translations or explanations of the meaning of the target words. The participants' answers were graded on a detailed rubric scale (see Appendix 3) based on how correct the answers were. The scoring criteria were primarily made through discussion by three raters, and graduates majoring in business administration and biotechnology gave additional advice.

### 3.5 Scoring and Data Analysis

This section shows how to score the participants' lexical guessing. To examine how participants guess unknown words and how their lexical guessing is affected by two factors (word density and topic familiarity), a detailed rubric for scoring lexical guessing was constructed. The purpose of the rubric is to see whether the participants figure out the meaning of unknown words. Learners' responses will be scored using Nassaji's (2003)

3-point scale. If the answer is semantically, syntactically, and contextually appropriate, it obtained two points. One point will be given for guessing that makes sense in the context but is only partly correct. Guessing that does not make sense in the context was considered failed and got 0 . Two experienced Korean teachers of English who have teaching experience more than five years separately evaluated the learners' responses using the criteria for each target word. Disputes were resolved through discussion among two teachers of English and writer.

Example 3: The fastest growing animals may produce offspring within days, whereas many bacteria can do so within hours, and some can zagglesh in less than ten minutes.

The exact word was 'multiply', which means increases considerably in the number of amounts. For instance, responses jeungsighada or beonsighada could get two points because those answers could replace the original word 'multiply'. However, gaecheleul saengsanhada, which means 'increase the number of population,' could get one point because they explained the word with a similar meaning but didn't guess the exact meanings of words and didn't fit the context completely. Lastly,
sujeonghada, which means 'fertilization' or dalseonghada, which means 'achievement,' got zero points because the meanings of the words were completely different from the original word.

IBM SPSS Statistics Version 25.0 for Windows was employed for the statistical analysis. First, in order to answer the research questions, repeated a two-way repeated measures ANOVA was employed with word density ( $98 \%$ and $95 \%$ ) and text familiarity (Familiar and unfamiliar) as independent variables and lexical guessing score as a dependent variable.

## CHAPTER 4.

## RESULTS AND DISCUSSION

This chapter presents a detailed analysis of the data related to the research topics and discusses the findings. Section 4.1 shows descriptive data of lexical guessing. The following section, 4.2, displays results about the role of word density on lexical guessing. And section 4.3 shows results about the role of topic familiarity on lexical guessing.

### 4.1 Descriptive data

The results of the total scores' L2 lexical guessing under four conditions (i.e., $98 \%$ familiar, $98 \%$ unfamiliar, $95 \%$ familiar, $95 \%$ unfamiliar) are summarized in Table 4.1. It shows the means, standard deviations, and the number of participants. Figure 4.1 also displays that shows lexical guessing scores among various conditions.

TABLE 4.1
Total Descriptive Statistics for Lexical Guessing

| Word density | Topic <br> familiarity | Total <br> score | Mean | SD | $\mathbf{N}$ |
| :--- | :---: | :---: | :---: | :---: | :---: |
| $98 \%$ | Familiar | 8 | 4.72 | 1.68 | 58 |
|  | Unfamiliar | 8 | 3.10 | 1.80 | 58 |
| $95 \%$ | Familiar | 8 | 4.07 | 2.17 | 58 |
|  | Unfamiliar | 8 | 2.36 | 1.70 | 58 |

## TABLE 4.2

Topic Familiarity Descriptive Statistics for Lexical Guessing

| Text | Topic <br> familiarity | Mean | SD | $\mathbf{N}$ |
| :---: | :---: | :---: | :---: | :---: |
| Text 1 | Familiar | 4.361 | .480 | 26 |
| Bacteria <br> Evolution | Unfamiliar | 1.992 | .665 | 32 |
| Text 2 | Familiar | 4.192 | .567 | 26 |
| Stem cells <br> therapy | Unfamiliar | 2.015 | .735 | 32 |
| Text 3 | Familiar | 4.215 | .542 | 32 |
| Exchange rate <br> currency | Unfamiliar | 2.330 | .813 | 26 |
|  |  |  |  |  |
| Text 4 | Familiar | 3.984 | .697 | 32 |
| Low-balling <br> Price | Unfamiliar | 1.630 | .758 | 26 |

## Figure 4.1

## Total Results of the Lexical Guessing



As shown in Table 4.1 and Figure 4.1, the higher word density group (98\%) showed higher lexical guessing scores than the lower word density ( $95 \%$ ) group ( $98 \%$ density group $=3.91 ; 95 \%$ density group $=3.21$ ). Also, the topic familiar group showed higher lexical guessing scores than the topic unfamiliar group (Topic familiar Group $=4.39$; Topic unfamiliar Group $=2.73$ ). Depending on each text, the participants' lexical guessing scores are also displayed in Table 4.1.

In order to statistically verify the effects of each independent variable (i.e., word density and topic familiarity), a two-way repeated measures ANOVA was employed. Sections 4.2, 4.3, and 4.4 present the main effects of word density, topic familiarity, and an interaction effect.

## TABLE 4.3

## A Summary of the Two-Way Repeated Measures ANOVA on Lexical Guessing

| Source | $S S$ | $d f$ | $M S$ | $F$ | $p$ | Partial <br> $\eta^{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Word <br> density | 28.280 | 1 | 28.280 | 16.206 | $<.001^{* * *}$ | .221 |
| Error | 99.470 | 57 | 1.745 |  |  |  |
| Topic <br> familiarity | 160.556 | 1 | 160.556 | 37.022 | $<.001^{* * *}$ | .394 |
| Error | 247.194 | 57 | 4.337 |  |  |  |
| Word <br> density * <br> Topic <br> familiarity | .108 | 1 | .108 | 0.033 | 0.856 | .001 |
| Error | 185.642 | 57 | 3.257 |  |  |  |

Note. Significant level: ${ }^{* * *} \mathrm{p}<0.001$

## TABLE 4.4

## Effects of Word Density on Lexical Guessing According to Different Pairs

| Pair | Mean | S.D | t | df | Sig |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Familiar \& 98\% - |  |  |  |  |  |
| Familiar \& 95\% | .655 | 2.467 | 2.022 | 57 | $.048^{*}$ |
| Unfamiliar \& 98\% - |  |  |  |  |  |
| Unfamiliar \& 95\% | .741 | 1.978 | 2.854 | 57 | $.006^{* *}$ |
| Significant level: ${ }^{*} \mathrm{p}<.05,{ }^{* *} \mathrm{p}<.01,{ }^{* * *} \mathrm{p}<0.001$ |  |  |  |  |  |

TABLE 4.5

## Effects of Topic Familiarity on Lexical Guessing According to Different Pairs

| Pair | Mean | S.D | t | df | Sig |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Familiar \& 98\%- |  |  |  |  |  |
|  <br> $98 \%$ | 1.620 | 2.375 | 5.196 | 57 | $.000^{* *}$ |
|  |  |  |  |  |  |

Familiar \& 95\% -

|  <br> $95 \%$ | 1.706 | 3.089 | 4.208 | 57 | $.000^{* *}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |

Significant level: $\mathrm{p}<0.001$

### 4.2 Effects of Word Density on Lexical Guessing

According to Table 4.3, there existed no interaction effect between word density and topic familiarity. Thus, examining each individual factor, there existed main effects. Regarding the first research question ("Does word density have an influence on Korean EFL learners' lexical guessing?"), the effects of word density on lexical guessing appeared statistically significant $(\mathrm{F}[1,57]=16.206, \mathrm{p}<.001, \eta 2=.221)$.

A series of paired samples t-test were further conducted to confirm the word density of the significant differences in same topic familiar conditions in terms of lexical guessing. As resented in Table 4.4. the difference between $98 \%$ and $95 \%$ word density was significant in the familiar texts $(\mathrm{p}=.048)$ regarding to lexical guessing while no statistical significance was found in the unfamiliar text pairs ( $\mathrm{p}=.006$ ). It implies word density makes more difference in unfamiliar conditions. Learners lexical guessing performances were more successful with higher word density regardless of the different text familiarity.

### 4.3 Effects of Topic Familiarity on Lexical Guessing

Regarding the second research question ("Does the topic familiarity have an influence on Korean EFL learners' lexical guessing?"), the effects of topic familiarity appeared statistically significant $(\mathrm{F}[1,57]=37.022, \mathrm{p}$ $\left.<.001, \eta^{2}=.394\right)$.

A series of paired samples $t$-test were additionally conducted to identify topic familiarity of the significant differences in different conditions in terms lexical guessing. As resented in Table 4.5, The difference between topic familiar and unfamiliar conditions was significant in both $98 \%$ and $95 \%$ density (both $\mathrm{p}<0.001$ ) with respect to lexical guessing. Learners lexical guessing performances were more successful with higher topic familiarity regardless of the different word density levels.

### 4.4 Interaction Effects of Word Density and Topic Familiarity on Lexical Guessing

Regarding the third research question ("Does both word density and topic familiarity have an interaction effect on Korean EFL learners' lexical
guessing?), the interaction effect on lexical guessing didn't seem to exist significantly $(\mathrm{F}[1,57]=0.033, \mathrm{p}=0.856 \eta 2=.001)$.

Figure 4.2


### 4.5 Discussion

The current study aimed to examine the effects of word density and
topic familiarity on Korean EFL college-level learners' lexical guessing. For this goal, 4.5.1 and 4.5.2 discuss the effects of word density and topic familiarity on lexical guessing.

### 4.5.1 Effects of Word Density

The first research question raised the effects of word density (controlled through 98\% and 95\%) on lexical guessing in L2. The two-way repeated measures ANOVA showed that the main effects of word density on lexical guessing were significant ( $\mathrm{p}<.001$ ). The findings suggested that increasing word density enhanced the guess of the meanings of target words correctly. It emphasizes the significant role that word density plays an important role in lexical guessing. The study's findings are also in line with previous studies (e.g., Chegeni \& Tababaei, 2014; Hirsh \& Nation, 1992; Hsueh-Chao \& Nation, 2000; Johns, 1980; Wesche \& Paribakht, 2010).

Rather than simply asking about the role of word density in lexical guessing, this study specifically asked the question, whether there are any meaningful differences between $95 \%$ and $98 \%$ word density in terms of how
well EFL college-level EFL learners guess the meaning of unknown words. According to the results, a meaningful difference between $95 \%$ and $98 \%$ word density seems to exist. When readers meet high-density passages (98\% word density), they can guess the meaning of unfamiliar words more accurately. In comparison, when they met low-density passages ( $95 \%$ word density), these passages didn't seem to allow the students to guess the unknown words successfully.

This result may be due to the correlation between vocabulary knowledge and reading comprehension, which, in turn, may impact the participants' capacity to guess unknown words. These are also in line with previous studies (e.g., Barnett, 1989; Ehsanzadeh, 2012; Hatami \& Tavakoli, 2012; Coady \& Huckin, 1999; Laufer, 1997; Nassaji, 2004, 2006; Morrison, 1996). The vocabulary knowledge of the reader is crucial for guessing the unknown words in a text. Readers may be unable to use contextual cues to draw word meanings if the proportion of known to unknown words is too high, in which $95 \%$ word density seems insufficient to guess the unknown meanings.

Contrary to the overall effect of word density on lexical guessing in
the study, a reverse result was found in the fourth text in the study (Higher Density Group $=3.54,3.40,4.64,4.10$; Lower Density Group $=2.17,2.04$, 3.77, 4.93 see Appendix 3). There is a chance that the other variables might intervene with the results. In particular, the lexical guessing score was higher in the $95 \%$ word density than $98 \%$ in the fourth text. Also, a slight difference exists between texts. Regarding the lexical guessing scores among the four texts, texts 1 and 2 were lower than those from 3 and 4. Although all four texts in this study had similar reading ease scores and were presumed to be at the same readability level, syntactical or structural differences between the texts might contribute to varying degrees of lexical guessing results. The location of target words in the text, the part of speech of target words, and the number of implied contextual cues may also have an impact. Also, the text topic itself can explain the differences. Texts 1 and 2 are biology-related topics, so it is difficult to access or read unless readers major in biology. On the other hand, regarding texts 3 and 4, even though the topic is related to an issue of the economy, it is more likely to get exposed to the economy in daily life. Thus not only the participants majoring in business administration or economics but also the participants
majoring in biotechnology or medical science might have been exposed to this kind of topic. Topic familiarity can be expected to neutralize the impact of word density on lexical guessing in texts 3 and 4 .

### 4.5.2 Effects of Topic Familiarity

The second question investigates the main effects of topic familiarity (controlled through familiar and unfamiliar) on lexical guessing. Higher levels of topic familiarity might have offered a cognitive foundation for enhanced text comprehension. In other words, topic familiarity helps L2 readers guess the meaning of unknown words. The overall results were consistent with previous studies (e.g., Atef-Vahid, Maftoon, \& Zahedi, 2013; Carrel, 1983; Darvand \& Ketabi, 2015; Kaivanpanash \& Rahimi, 2017; Kim, 2010; Liu \& Nation, 1985; Leeser, 2007; Pulido, 2004; Pulido, 2007). It may have helped the participants to develop a well-formed schema for relating their existing knowledge to the texts presented. Lexical guessing was more plausible when reading a more familiar text than when reading a less familiar text. At least, in this study, topic familiarity served as a reliable
predictor for lexical guessing.

This result may be due to the correlation between background knowledge and lexical guessing. Prior knowledge of the learners influences guessing. These results are also in line with previous studies (e.g., Grabe, 2004; Kintsch, 1988; Nassaji, 2002; Siddiek \& Horiba, 1990). Linguistic knowledge combines with background knowledge and aid guessing based on context. Indeed, successful guessing is based on a more detailed conceptual framework in which L2 readers utilize prior background knowledge, and the surrounding linguistic information may help trigger a plausible meaning of unknown words.

Although the results may not be abnormal, the findings are based on a methodology that explicitly controlled texts and learners. Regarding text, all texts used in this study were expository texts, and their levels are quite high according to the flesh-Kincaid level. Also, there were strict criteria for selecting words for lexical guessing, such as all words were critical content words based on the core content of the text. The location of the target words was controlled. The target words were evenly distributed across the texts. For example, two unknown words could not appear side by side in a
sentence. However, in a normal and ordinary reading situation, readers might not encounter unknown words in a controlled context as the experiment goes. It is unlikely that all the words they infer are content words nor are scattered. Therefore, it may not be easy to get aid from contextual clues to guess the meaning of unknown words. Lexical guessing would be more complicated in an ordinary context. Thus readers should be cautious when applying these results to other uncontrolled situations. However, at least it can be inferred that word density level (98\% vs. 95\%) and topic familiarity (familiar vs. unfamiliar) can influence how an L2 reader guesses the meaning of an unknown word in a text.

## CHAPTER 5.

## CONCLUSION

This chapter is composed of three sections. Section 5.1 summarizes the major findings of the present study. Major findings obtained are presented about each of the three research questions. The results of the currents are also discussed in relation to previous studies. The thesis aimed to investigate the effects of word density and topic familiarity on Korean EFL university students' lexical guessing performance. For this goal, each of the research questions will be answered. In section 5.2, the pedagogical implications are presented. Finally, section 5.3 reports the limitations of the current study and makes suggestions for further research.

### 5.1 Major Findings

The present study was designed to investigate the effects of word density and topic familiarity on Korean EFL university students’ lexical guessing. Readers' data was collected on a topic familiarity questionnaire
and lexical guessing tasks, including four texts. This study addressed the three essential research questions: 1) Does word density influence Korean EFL learners' lexical guessing? 2) Does the topic familiarity have an influence on Korean EFL learners' lexical guessing? 3) Does both word density and topic familiarity have interaction effects on Korean EFL learners' lexical guessing?

These are the primary findings: For the first research question ("Does the word density have an influence on Korean EFL learners’ lexical guessing?), the scores of the Korean EFL university students' lexical guessing test by two different groups: higher density group and lower density group were examined. The former group's density level was $98 \%$, and the latter group's density level was $95 \% .98 \%$ density group needed to guess ten words, and the $95 \%$ density group needed to guess four words in a text. All four different texts include 200 words. A two-way repeated measures ANOVA was conducted to test the word density's main effect on the Korean EFL university learners' overall lexical guessing test performance. The results showed that the readers' lexical guessing average scores are different between the two groups and affected by the word
density level. A significant effect of word density on lexical guessing performance was found. The statistical analysis indicated that the higherdensity $\operatorname{group}(98 \%$ word density), which knows more words around unknown words, performed significantly better on lexical guessing tests. They got benefit from higher density and guessed the unknown words better. The results of the present study seemed to agree with the conclusion of the previous research studies (e.g., Chengeni \& Tabatabaei, 2014; Hu \& Nation, 2000; Laufer, 1997), which claimed that word density has significant effects on lexical guessing ability.

For the second research question ("Does the topic familiarity have an influence on Korean EFL learners' lexical guessing?), the Korean EFL university students' lexical guessing test scores were divided into two groups: the topic familiar group and the topic unfamiliar group. A significant effect of topic familiarity on lexical guessing performance was found. A two-way repeated measures ANOVA was conducted to test the topic familiarity's main effect on the Korean EFL university learners' overall lexical guessing test performance. The statistical analysis indicated that the group which felt more familiar with the text topic performed significantly
better on lexical guessing tests. They got benefit from familiarity and guess unknown words better. The results of the present study seemed to agree with the conclusion of the previous research studies (e.g., Atef-Vahid, Maftoon, \& Zahedi, 2013; Darvand \& Ketabi, 2015; Pulido, 2003; Pulido, 2007), which claimed that topic familiarity has significant effects on the lexical guessing ability. Pulido (2007) found that topic familiarity had a statistically significant influence on lexical guessing. When reading about a more familiar topic, there was significantly more right target word guessing than when reading about a less familiar one. Reading more familiar texts may allow readers to utilize schema to relate their existing knowledge to the given texts. The readers can likely reach higher comprehension by creating complete meanings from the context.

For the last question ("Does both word density and topic familiarity have interaction effects on Korean EFL learners' lexical guessing?'"), both two independent variables were significant for the university students' lexical guessing. A two-way repeated measures ANOVA was conducted in order to test the interaction effects between word density and topic familiarity on the Korean EFL university learners’ overall lexical guessing
test performance. This indicates that word density and topic familiarity significantly affect lexical guessing performance. However, there was no interaction effect between the two variables. It means the two variables didn't interact with each other.

In conclusion, the results of the current study revealed a positive relationship between word density and lexical guessing. Also, the relationship between topic familiarity and lexical guessing was positive. Based on the finding presented above, it can be noted that the EFL collegelevel learners' lexical guessing is affected by word density and topic familiarity. On this basis, word density and text familiarity must be considered in lexical guessing instruction

Furthermore, most of the average lexical guessing scores were lower than half. The guesses observed throughout the study demonstrates lexical guessing from context is not always an easy strategy. In other words, accurate lexical guessing is challenging to L2 learners even though most participants' language proficiency levels were higher than intermediate-high level. Since lexical guessing requires precise word recognition and context comprehension, it is not easy for L2 learners to guess unknown words using
contextual cues. Also, lexical guessing can only be successful when the text's surrounding words are known and a significant amount of prior knowledge and context is needed. Therefore, it needs great training in vocabulary, syntactic knowledge, background knowledge, metacognition, and advanced reading skills. Learners must prepare other strategies when guessing from context fails. Encouraging students to guess will result in so much failure for students even when the context is explicit enough to guess.

The study's findings contribute in several ways to L2 teaching. First, the study gives further insight into the process of lexical inference by Korean EFL learners with varying vocabulary and background knowledge. There has been no study on lexical guessing of Korean EFL college learners. Therefore, this study is meaningful because it discovered Korean learners' lexical guessing patterns with similar English levels. Second, the study results demonstrate a high link between lexical guessing and word density and between lexical guessing and topic familiarity.

### 5.2 Pedagogical implication

The study's findings provide some important pedagogical guidelines for instructing lexical guessing. The results showed that two factors (word density and topic familiarity) need to be considered for successful lexical guessing because word density and topic familiarity affect L2 students' lexical guessing. Increased understanding of the impacts of word density and topic familiarity on lexical guessing will be helpful in the instruction of EFL students.

First, the importance of vocabulary knowledge is emphasized by the results of the present study. This is because, in order to utilize context effectively, enough vocabulary knowledge is required. As the results show, $98 \%$ of word density group students do better at lexical guessing than $95 \%$ of the density group, so increasing vocabulary knowledge can encourage L2 learners to use the lexical guessing strategy more successfully. The lower the number of unknown words, the larger amount of accessible cues for guessing. When students encounter a text with a high frequency of new words, these new words can prevent them from using contextual clues, which may increase their difficulty guessing meanings. Cain, Lemmon, and

Oakhill (2004) showed that learners with weak vocabulary knowledge performed poorly on lexical guessing even after receiving the direct instruction challenge. It means little vocabulary knowledge could impair the effects of instruction, so vocabulary knowledge is essential. As Nation (2006) suggested, to comprehend the meanings of a text, a reader must have a large vocabulary size enough to cover the text. Reading comprehension and lexical guessing rely heavily on a learner's vocabulary knowledge.

So developing basic vocabulary knowledge is required before learning strategies for using lexical guessing strategy. The explicit learning of vocabulary is essential since it is the most effective method for constructing the first step in acquiring vocabulary knowledge (Schmitt, 2008). Once vocabulary knowledge is acquired above a certain level, incidental learning of vocabulary should also be considered to encourage L2 learners to expand their vocabulary by continuous reading and listening. As Ehsanzadeh (2020) suggested, the focus of vocabulary teaching in the EFL context is only to expand the vocabulary knowledge's breadth. Learners mostly have to depend on translation strategy. However, considering the significance of vocabulary knowledge depth in lexical guessing and
incidental learning, integrating and incorporating depth and breadth of vocabulary knowledge is needed. Teachers and instructors may use this study's findings when helping students select instructional resources to enhance their language. Or teachers may design appropriate curricula by analyzing students' vocabulary knowledge and their level. Broader and deeper vocabulary knowledge can be acquired when EFL students read more authentic texts and understand the various usage of words in context.

Secondly, based on schema theory, it appears critical that EFL/ESL teachers match their students' background knowledge with the texts assigned to read and practice lexical guessing. The study's findings demonstrated topic familiar groups make more accurate lexical guessing than topicunfamiliar groups. Adams (1982) emphasized that teaching effectiveness varies depending on the familiarity with the text topic. It was discovered that when instructing L2 learners to guess the meaning of target words, they were more effective when they were aware of the texts' topic. Even if students do not know all of the vocabularies in a text, familiarity with the topic can help reduce discomfort while reading new words and increase reading comprehension. So activating background knowledge related to the
text topic will be helpful, given the close relationship between topic familiarity and lexical guessing. EFL/ESL teachers must expand their students' background knowledge implied by the texts before they assign students to read. Pre-task training, material previewing, and teaching comprehension skills might be proposed to increase the activation of relevant prior information,

Lastly, formal teaching in lexical guessing is needed to help learners since, in most cases, students do not exploit contextual cues even when they can (Bengeleil \& Paribakht, 2004; Bensoussan \& Laufer, 1984; Çetinavcı, 2014; Clarke \& Nation, 1980; Coady \& Nation, 1988; Dunmore, 1989; İstifçi, 2009; Grellet, 1998; Hu \& Nassaji, 2014; Parel, 2004; Walters, 2004). As a critical process in reading comprehension, lexical guessing should get some educational focus in L2 reading classes. The ability to make guessing could increase reading comprehension by considering and analyzing the available cues and seeking confirmation of the prediction (Cain \& Oakhill, 1999; Dunmore, 1989; Juliana, 2019b). Juliana (2019b) demonstrated that lexical guessing had a significant impact on reading comprehension abilities. To help students perform better in reading comprehension, teaching lexical
guessing strategies should be recommended. Furthermore, actively practicing lexical guessing contributes to comprehending new words in context and vocabulary expansion, so instructing lexical guessing is essential in many ways. It is also beneficial to give students practice determining which unknown vocabulary should be looked up in the dictionary and which should be ignored (Clarke \& Nation, 1980). Teaching L2 learners aware of the various types of knowledge sources and contextual cues that can be used in guessing, both within and outside the text, will be helpful in many ways. For instance, Bensoussan \& Laufer (1984) suggested teaching lexical guessing using strategies: comparison and contrast, definition, explanation, illustration, etc. Kolahi, Alikhademi, \& Kehtari (2013) showed the participants who were instructed to use contextual clues focusing on four types: explanation, example, antonym, and synonym, did better guessing the meaning of unknown vocabulary than the participants in the controlled group. In class, opportunities for practicing guess and using contextual cues for lexical guessing should be needed. Students can increase their ability to guess more after instruction.

The findings of this study suggested the necessity of teaching
lexical guessing skills in the design of a foreign language curriculum. However, trying to teach lexical guessing, it appears that the class will only be advantageous only when the class is controlled in a detailed way. Most participants struggle when they first try to recognize and use contextual signals to guess unknown target words during reading. Sometimes, learners will guess incorrectly. So, considering the findings, it is advisable to begin with, low-density and familiar passages while practicing lexical guessing. In other words, it is better to ensure plenty of known words surrounding difficult words in context when teaching lexical guessing. Teachers can adapt or add contextual clues to educate students to recognize and use clues. Using texts which can touch learners' preconceived knowledge will be helpful.

Also, class form run as a group activity can lead the learners to be able to guess more correctly. This approach will be helpful not only for language acquisition but also for motivation. In general, advanced-level learners do better at guessing, so they can learn more and help lower-level peers. However, Liu \& Nation (1985) noticed that the lower proficiency level group could also guess difficult words as the higher group. If students
work together and share their guessing, a large proportion of the words in the passages can be correctly guessed. As a result, it is even more helpful to practice the guessing strategy as a group activity than as an individual exercise.

Although the teaching method through communicative language teaching has increased in recent years, Korean English classes still have limitations in that they mainly remain one-way. But by this interactive and integrated class for lexical guessing, students may exchange information about the cues they utilize. After learners become familiar with the strategy, the follow-up instruction can become more individual. Training in the knowledge and application of skills to guess word meanings from context can help highly proficient and less proficient learners improve. Therefore, high-level and low-level learners can properly use contextual clues for lexical guessing and increase their guessing accuracy. Teaching can help students guess the meaning of words and enforce the learner's reading comprehension.

The findings should not be understood to mean that over $95 \%$ coverage of word density or topic-related familiarity or learning lexical
guessing strategy assures effective reading performance. Also, it does not mean no other skills or knowledge are required to acquire lexical guessing skills. Other factors should take other variables into account. However, significant improvement can be made if lexical guessing is taught considering word density and topic familiarity, two independent variables that affect lexical guessing.

### 5.3 Limitation

This research has several limitations, which prompted further investigation. First of all, the study lacked power because of the limited number of only 58 adult participants. It wasn't easy to generalize the results to bigger populations. Also, as suggested in the discussion, the current thesis was controlled by strict criteria. It is advised to investigate larger samples of participants to confirm the findings. In addition, an experimental design, almost similar to normal and original reading situations, is needed to study the relationship between factors and lexical guessing.

Second, the study would have been more realistic if participants had
taken the guessing tasks, which included real words they didn't know rather than nonsense words. Participants can use more cues, such as a common collocation, to assist in guessing when they guess a meaning of an actual word. However, to control the word density strictly, the usage of nonsense words was the best option.

In this paper, word density and topic familiarity were assumed to be the only independent variables affecting lexical guessing. However, research has shown that successful lexical guessing depends on many factors, such as learners' motivation, memory capacity, language proficiency, age, and learning styles. Thus, other than the two factors investigated in this research, various factors should also be considered when teaching students how to use lexical guessing strategies successfully.

Despite these limitations, the results and findings of the study offer novel insights into the link between word density, topic familiarity, and lexical guessing, which leads us a step closer to understanding how two independent variables influence lexical guessing in reading comprehension.

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## APPENDIX 1.

Topic Familiarity Survey

| 박테리아, 박테리아 진화(이과 1번 주 <br> 제)에 대한 주제 친숙도 설문지 | 전혀 아니다 < |  |  | > 매우 그렇다 |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1. 박테리아, 박테리아 진화에 대한 <br> 정보를 접한 적 있다. | 1 | 2 | 3 | 4 | 5 |
| 2. 박테리아, 박테리아 진화에 관한 <br> 글(한,긍, 영어)를 읽은 적 있다. | 1 | 2 | 3 | 4 | 5 |
| 3. 박테리아, 박테리아 진화에 관한 <br> 소재, 내용에 대해 배운 적 있다. | 1 | 2 | 3 | 4 | 5 |
| 4. 박테리아, 박테리아 진화에 대해 <br> 자유롭게 설명할 수 있다. | 1 | 2 | 3 | 4 | 5 |
| 5. 박테리아, 박테리아 진화는 나에게 <br> 비교적 친숙한 소재이다. | 1 | 2 | 3 | 4 | 5 |
| 줄기세포, 줄기세포 치료 (이과 2번 주 <br> 제)에 대한 주제 친숙도 설문지 | 전혀 아니다 < | > 매우 그렇다 |  |  |  |
| 1. 줄기세포, 줄기세포 치료에 대한 <br> 정보를 접한 적 있다. | 1 | 2 | 3 | 4 | 5 |
| 2. 줄기세포, 줄기세포 치료에 관한 <br> 글(한글, 영어)를 읽은 적 있다. | 1 | 2 | 3 | 4 | 5 |
| 3. 줄기세포, 줄기세포 치료에 관한 <br> 소재, 내요엥 대해 배운 적 있다. | 1 | 2 | 3 | 4 | 5 |
| 4. 줄기세포, 줄기세포 치료에 대해 <br> 자유롭게 설명할 수 있다. | 1 | 2 | 3 | 4 | 5 |
| 5. 줄기세포, 줄기세포 치료는 나에게 <br> 비교적 친숙한 소재이다. | 1 | 2 | 3 | 4 | 5 |


| 환율, 환율변동이 경제에 미치는 영 <br> 향(문과 1번 주제)에 대한 주제 친숙 <br> 도 설문지 | 전혀 아니다 < |  |  |  | > 매우 그렇다 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |

## APPENDIX 2.

## Text Form A

추론해야 할 단어는 non-sense word로 본래의 단어와 전혀 관련이 없는, 실제로는 존재하지 않는 단어입니다.
밑줄 친 non-sense word를 추론하시면서 오답이라고 느껴지더라도 가능 한 답안을 작성해주십시오. 답안은 영어와 한국어 모두 가능하며, 유의어 에 해당하는 비슷한 영단어, 번역한 한국어 단어, 풀어서 추론한 것도 모 두 가능합니다.

자신의 페이스에 맞춰 적어도 두 번은 구절을 주의 깊게 읽으십시오. 각 번호에 맞추어 빈칸으로 된 단어의 의미를 최대한 추론하고, 한국말이나 영어(유의어)로 이를 기술해주시면 됩니다. 한 단어로 제시하지 않고, 풀 어서 설명해도 됩니다.

* 전혀 의미가 추론되지 않는 경우: 전혀 모르겠음으로 써주십시오.


## 1. Word Density 98\%

The evolution of bacterial species is faster than that of animals and plants because they have had more time to evolve (existing so much longer). In addition, their generation times are much shorter. The fastest growing animals may produce offspring within days, whereas many bacteria can do so within hours, and some can (1) zagglesh in less than ten minutes. A
few mutations are likely to occur every once in a while within a population, which by themselves are evolutionarily insignificant, but eventually the (2) blastlinlast of theses mutations drives the changes necessary to adapt to novel environment. This results in the development of novel species. The build-up of mutations over generations occurs much faster in bacteria than it does in animals and plants. Even animals and plants living today differ from those that lived in a distant past, so early bacteria must have been quite different from those we know today. Nevertheless, this is often (3) chostled when the bacteria that lived in past eons are considered; We do not know what bacteria looked like when the earth was still young. Given the conditions that applied then, they must have been able to live without atmospheric (4) famdet and to endure extreme temperature. They may have lived in water before exploring land, but all of this is uncertain. Therefore lacking specific knowledge about these past creatures, we describe them in terminology only fit for presentday bacteria.

1. 밑줄 친 (1) zagglesh 단어의 의미를 쓰시오.
2. 밑줄 친 (2) blastlinlast 단어의 의미를 쓰시오.
3. 밑줄 친 (3) chostled 단어의 의미를 쓰시오.
4. 밑줄 친 (4) famdet 단어의 의미를 쓰시오.

## 2. Word Density 95\%

The evolution of bacterial species is faster than that of animals and plants because they have had more time to evolve (existing so much longer). In addition, their (1) swaermture times are much shorter. The fastest growing animals may (2) complit offspring within days, whereas many bacteria can do so within hours, and some can (3) zagglesh in less than ten minutes. A few mutations are likely to occur every once in a while within a population, which by themselves are evolutionarily insignificant, but eventually the (4) blastlinlast of theses mutations drives the changes necessary to (5) miltact to novel environment. This results in the development of novel species. The build-up of mutations over generations occurs much © plusier in bacteria than it does in animals and plants. Even animals and plants living today differ from those that lived in a distant past, so early bacteria must have been quite different from those
we know today. Nevertheless, this is often (7) chostled when the bacteria that lived in past eons are considered; We do not know what bacteria looked like when the earth was still young. Given the (8) travests that applied then, they must have been able to live without atmospheric (9) famdet and to endure extreme temperature. They may have lived in water before exploring land, but all of this is uncertain. Therefore lacking specific knowledge about these past creatures, we describe them in (10) thopization only fit for present-day bacteria.

1. 밑줄 친 (1) swaermture 단어의 의미를 쓰시오.
2. 밑줄 친 (2) complit 단어의 의미를 쓰시오.
3. 밑줄 친 (3) zagglesh 단어의 의미를 쓰시오.
4. 밑줄 친 (4) blastlinlast 단어의 의미를 쓰시오.
5. 밑줄 친 (5) miltact 단어의 의미를 쓰시오.
6. 밑줄 친 (6) plusier 단어의 의미를 쓰시오.
7. 밑줄 친 (7) chostled 단어의 의미를 쓰시오.
8. 밑줄 친 (8) travests 단어의 의미를 쓰시오.
9. 밑줄 친 (9 famdet 단어의 의미를 쓰시오.
10. 밑줄 친 (10) thopization 단어의 의미를 쓰시오.

## APPENDIX 3.

# Descriptive Statistics for Lexical Guessing in Two Word Density Levels and Two Familiarity Groups 

|  | Word density | Topic familiarity | Mean | SD | N |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Text 1 <br> Bacteria | 98\% | Familiar | 4.15 | 1.41 | 13 |
|  |  | Unfamiliar | 3.00 | 1.41 | 15 |
|  |  | Total | 3.54 | 1.50 | 28 |
|  | 95\% | Familiar | 2.46 | 1.76 | 13 |
|  |  | Unfamiliar | 1.94 | 1.43 | 17 |
|  |  | Total | 2.17 | 1.58 | 30 |
| Text 2 <br> Stem <br> cells | 98\% | Familiar | 4.77 | 1.30 | 13 |
|  |  | Unfamiliar | 2.35 | 2.18 | 17 |
|  |  | Total | 3.40 | 2.19 | 30 |
|  | 95\% | Familiar | 3.15 | 1.86 | 13 |
|  |  | Unfamiliar | 1.07 | 1.10 | 15 |
|  |  | Total | 2.04 | 1.82 | 28 |
| Text 3 <br> Exchange <br> rate | 98\% | Familiar | 4.93 | 1.75 | 15 |
|  |  | Unfamiliar | 4.31 | 1.80 | 13 |
|  |  | Total | 4.64 | 1.77 | 28 |
|  | 95\% | Familiar | 4.29 | 1.72 | 17 |
|  |  | Unfamiliar | 3.08 | 1.44 | 13 |
|  |  | Total | 3.77 | 1.70 | 30 |
| Text 4 <br> Price strategy | 98\% | Familiar | 4.94 | 2.08 | 17 |
|  |  | Unfamiliar | 3.00 | 1.08 | 13 |
|  |  | Total | 4.10 | 1.95 | 30 |
|  | 95\% | Familiar | 6.00 | 1.69 | 15 |
|  |  | Unfamiliar | 3.69 | 1.65 | 13 |
|  |  | Total | 4.93 | 2.02 | 28 |

## APPENDIX 4.

Criteria of Scoring Lexical Guessing


## 국 문 초 록

## 한국 대학생 영어 학습자들의 어휘 추론:

## 단어 밀도와 지문 친숙도를 중심으로

은 선 민<br>외국어교육과 영어전공<br>서울대학교 대학원

본 연구는 영어 수준이 중급 이상인(intermediate high) 한국인 EFL 대학생들의 단어 밀도(word density), 주제 친숙도(topic familiarity)이 어휘 추론(lexical guessing)에 미치는 영향에 대해 탐구한다.

본 연구 참여자는 한국인 대학생 58 명이 참가하였으며 이중 절반에 해 당하는 32 명은 경제 및 경영 계열 전공자로 선정하였고, 다른 절반에 해당하는 26 명은 생명공학 및 의학 계열 전공자로 선정하였다. 참가자들은 네 가지 다른 조건 - $98 \%$ 단어 밀도 \& 친숙한 지문, $98 \%$ 단어 밀도\& 친숙하지 않은 지문, $95 \%$ 단어 밀도 \& 친숙한 지문, $95 \%$ 단어 밀도 \& 친숙하지 않은 지문에서 어휘 추론 과업을 수행하였다. 이들은 먼저 5점 리커트 척도로 구성된 주제 친숙도에 관 련한 설문지에 응답하였다. 이후 참가자들은 총 4 개의 지문으로 구성된 어휘 추론 과제를 수행하였다. 총 200 단어로 구성된 지문에서 $98 \%$ 단어 밀도에서는 10 개의 단어를, $95 \%$ 단어밀도에서는 4 개의 단어를 추론하였다. 공통된 4 개 단어 에 대해서 어휘 추론 점수는 비교되었다.

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본 연구의 결과에 따르면 첫 째, 단어 밀도는 어휘 추론에 통계적으로 유의미한 영향을 미쳤다. $98 \%$ 의 단어 밀도 조건에서 더 높은 어휘 추론 점수를 보였다. 단어 밀도가 높을수록 참가자들은 상당한 수준에서 더 정확하게 모르 는 어휘를 추론하였다. 둘 째, 주제 친숙도 또한 어휘 추론에 통계적으로 유의 미한 영향을 미쳤다. 친숙한 지문의 조건에서 더 높은 어휘 추론 점수를 보였 다. 지문의 주제가 친숙할수록 참가자들은 상당한 수준에서 더 정확하게 모르 는 어휘를 추론하였다. 두 독립 변인(단어 밀도, 주제 친숙도)가 개별적으로 종속 변인(어휘 추론)에 미치는 유의미한 영향이 관찰되었다. 하지만 셋 째, 두 독립 변인의 상호작용 효과는 관찰되지 않았다.

본 연구는 결과는 단어 밀도와 주제 친숙도가 어휘 추론 간의 긍정적 인 관계가 있음을 밝혀냈다. 따라서 다음과 같은 교육적 함의를 가진다. 첫째, 단어 밀도를 높일 수 있도록 근본적으로 학생들의 어휘 지식을 향상 시킬 수 있게 지도하여야 한다; 둘째, 어휘 추론에 있어서 배경 지식이 중요하기 때문 에 영어 교육에 언어적 지식 뿐 아니라 배경 지식 또한 포함시킬 수 있도록 해 야 한다. 언어적 지식과 어울러 학습자의 스키마가 같이 상호작용할 수 있도록 배경 지식을 활성화 시킬 수 있도록 지도해야 한다. 셋 째, 어휘 추론 전략은 하나의 읽기 전략으로 유용하게 사용할 수 있기 때문에 한국의 영어 교육 자체 내에서 어휘 추론에 대한 인식과 이를 가르치는 교수법이 발전되어야 한다. 본 연구의 한계 및 향후 연구를 위한 제안은 결론에서 심층적으로 제시된다.

