THE VOCABULARY LEVEL REQUIRED FOR THE READING PART OF THE UNIVERSITY ENTRANCE EXAM (EIT) IN ENGLISH IN UKRAINE

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Abstract:
This paper aimed to reveal the level of vocabulary required for comprehension of 95% and 98% of texts given in the reading part of the English test (EIT) taken by high-schoolers in Ukraine in order to enter universities. The results showed that around 8,000 most frequent English words are needed to be known to achieve comprehension of 98% of the texts. The figures provided in the research could potentially help raise Ukrainian ELT teachers’ awareness in developing an English curriculum. Moreover, the results support the suggestion made by Nation (2006), that vocabulary of about 8,000 most frequent words is needed for comprehension of authentic texts.

Keywords: vocabulary level, 95% comprehension, 98% comprehension, word frequency, LexTutor, authentic texts, reading, Ukraine, English, curriculum

1. Introduction

Most people in Ukraine are convinced that higher education is essential for getting special skills required for the field they wish to work in in the future. The number of high schoolers who wish to continue studying and get into universities is significant. A while ago, each higher education facility used to hold its entrance examinations. In 2008 the system changed. External Independent Testing (EIT) is required now to enter a university. The date, time, and contents for EIT in each subject are the same for all of the examinees in the country. However, each university may require a different set of EITs (e.g., Faculty of Economics of N University requires EIT results in Ukrainian language and literature and Mathematics; the Faculty of Foreign Languages of NN university requires EIT results in Ukrainian language and literature, Ukrainian history, and English). Receiving high scores is the goal of each examinee, as it gives them a chance for tuition-free higher education in public universities.

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In 2020 there were 117,666 high school graduates out of 340,000 who registered to pass EIT in English (www.osvita.ua). The number is quite large. All of the examinees spend months preparing for the exam that consists of three parts: listening, reading, and writing (lexical and grammatical aspects are included).

The present research is interested in the reading part of the test. The passages for the reading section are authentic, chosen from advertising leaflets, newspapers, and magazines of different genres and styles (Ministry of Education and Science of Ukraine, 2018) (see Appendix A). Understanding what the text is about in detail is extremely important for answering the follow-up questions correctly and gaining maximum scores. The extent of students’ vocabulary knowledge plays a crucial role in reading comprehension. A large body of research suggests that knowing 95% to 98% of words allows readers to comprehend the text (Hu & Nation, 2000; Laufer & Ravenhorst-Kalovski, 2010; Schmitt et al., 2011). However, 98% is believed to provide the best percentage of coverage for written text (Hu & Nation, 2000; Schmitt & Schmitt, 2014). Investigating the vocabulary size needed for adequate comprehension of the texts provided in the EIT might help examinees in preparing for the test, and teachers in providing effective vocabulary instruction in high schools.

2. Literature Review

One of the most important questions regarding teaching vocabulary that anyone involved in foreign language instruction might be wondering about is how many words a learner should know to reach their learning goals. People learn English for different reasons. Some might be interested in watching movies without L1 dubbing and reading their favorite books in English. And some might be interested in successfully passing various English proficiency tests, necessary for work and academic purposes. Since English has become the world’s lingua franca, taking these tests is a very common practice and the area of greatest interest to learners and teachers. The reading comprehension part of proficiency tests plays a significant role in getting a high score. That is why it would be extremely helpful to know the vocabulary size needed for different tests. There is a growing body of research investigating this topic.

The most known research by Hu and Nation (2000) suggested that the threshold for comprehension of written text is 98%. This coverage allows learners to understand texts of different genres independently, without using dictionaries, glosses, or teacher’s help. Laufer (1989) believes that 95% lexical coverage is enough for adequate comprehension of the written text.

With these numbers in the head, Kaneko (2020) tried to identify the vocabulary sizes needed for listening and reading comprehension in the most well-known English proficiency tests, like Text Coverage of Cambridge First, IELTS, TAEP, TOEFL, GTEC, and TOEIC. She has also included in her study a test called EIKEN, widely known in Japan. Kaneko examined 235 reading and 631 listening comprehension texts from 25 previous or official practice tests. She provided statistics regarding each test. By adopting
word family as a counting unit, she concluded that on average 2,000 to 5,000 most frequent word families from BNC/COCA were needed to understand 95% of running words in texts in different tests, and 3,000-to-8,000-word families for 98% coverage.

A study by Collins (2017) was determined to see whether the EFL textbooks students at Ritsumeikan Asia Pacific University (Oita, Japan) used to prepare for the TOEFL exam were sufficient enough in terms of vocabulary instruction. Since he was interested in the reading comprehension part the most, nine TOEFL reading comprehension texts were examined and then compared with 18 reading passages from two EFL textbooks. The author used word families as counting units and software called RANGE for the analysis. His results showed that about 6,000 word families were necessary to provide coverage of 98% of the reading part of the TOEFL test. By analyzing the vocabulary used in the two textbooks, the author has concluded that they could not provide sufficient vocabulary instruction to prepare for the test. Collins clearly showed how important it is to select textbooks carefully for different purposes.

Estimating the 1,000-word band that learners need to know in order to achieve 98% coverage of high-stakes tests can greatly help teachers prepare their learners for these exams. Although, local tests required in different countries for one or another purpose should not be neglected, as they might be very helpful to English teachers and learners who wish not to spend time on anything else, but studying for a particular test. Iwamoto and Kramer (2020) presented a very interesting study investigating the vocabulary size needed to pass entrance exams to public high schools in Japan. According to the authors, the Japanese government requires students to learn 1200 words in junior high school and 1,800 words in senior high schools. However, as it was spotted by the authors of the study, it was not decided which words exactly the learners were required to learn. Trying to fill in this gap, Iwamoto and Kramer analyzed two corpora made of the reading passages derived from National Central Test (NST) and Hyogo Prefectural Senior High School Entrance Exam. The authors used New General Service Lists (NGSL) (Browne et al., 2013) and software called AntWordProfiler for analyzing the target texts. The results suggested that junior high school students would need to know the first 1000 words of NGSL to have coverage of 98.11% of the reading texts used for the examinations. The English teachers in Japan might find the results of the presented study particularly interesting since the goal seems to be very realistic.

As it could be concluded from the studies mentioned above, the vocabulary size required for providing text coverage of 98% differs from test to test.

When reviewing the literature on vocabulary sizes for different tests for EFL students, it was noticed that there was no analysis of the entrance examination in English required to enter universities in Ukraine (EIT).
3. Research Questions

Owing to the existing gaps in the literature this study has the following research questions:

**Research question 1**: which 1,000-word family bands provide 98% coverage of the reading section of the EIT in English.

**Research question 2**: what is the difference between vocabulary levels needed for 98% and 95% coverage, as it is also claimed to be sufficient (Laufer, 1989).

**Research question 3**: what is the average vocabulary level required for the reading part of the EIT in English.

4. Method

4.1 Unit of Counting and Word Lists

To determine which 1,000-word bands provide 98% and 95% coverage on the reading section of English EIT, it is important to choose an appropriate unit of counting that reflects the kind of vocabulary knowledge the students possess. Three main units are frequently used. They are lemmas, flemmas, and word families. A lemma consists of a word’s base form, its inflected forms, and they must be the same part of speech (Nation & Meara, 2010) (e.g., live (v), lived (v), living (v), lives (v)). A flemma is a base form of the word and its inflected forms, regardless of parts of speech (McLean, 2018) (e.g., find (v), find (n), found (v), found (adj)). Nation and Waring (1997) define the word family as “a base word, inflected forms, and transparent derivations” (p. 6) (e.g., play (n), play (v), playing (v), playful (adj), playfulness (n), player (n), misplayed (adj), etc.). Bauer and Nation (1993) suggest that the knowledge of items included in the word family grows together with the learner’s proficiency. In Ukraine, it is expected that high-school graduates’ level of English is B2, according to the Common European Framework of Reference for Languages (CEFR) (Ministry of Education and Science of Ukraine, 2018), and that is why word families seem to be an appropriate counting unit in this research. Moreover, the use of word families (Level 6, according to Bauer and Nation’s (1993) categories) is in line with the list of affixes required to be learned in order to prepare for the test, and which is provided in the Program on Foreign Languages decided by the Ministry of Education of Ukraine (Ministry of Education and Science of Ukraine, 2018). Even though the level of English of high school graduates in Ukraine and other European countries is set according to CEFR standards, surprisingly enough, CEFR does not provide word lists for each level (Milton, 2010). During their history, there were two-word lists created for levels A1 and B1 (Council of Europe, 2001). However, the lists share many words and they are not 1,000-word band lists. Moreover, the target level, which is B2, is not covered specifically by any of the two lists. Word lists are a powerful tool for vocabulary learning (Hunt & Beglar, 2005), and well-organized lists are of great help to teachers. For the reasons mentioned above, word family lists from the British National Corpus (BNC)/Corpus of Contemporary American English (COCA) created by Nation
(2012) were used for profiling frequency levels of words in the English EIT. According to a study conducted by Dang et al. (2020), this list seems to be more useful word list for second language learners. The list consists of 25,000 most frequent word families, split into 1,000-word bands. The list is divided into high frequency, mid- and low-frequency levels.

4.1 Materials
Six sets of the reading section derived from official English EIT exam from years 2015 to 2020 were examined using a lexical frequency profiler called LexTutor. It is an online tool that evaluates complexity of the text. This software was chosen for a number of reasons: LexTutor is easy to use, and students and teachers could benefit from learning about it and using it; it is a free and open resource available to anyone and, the main reason, it contains a variety of vocabulary corpora.

Written multiple-choice items and comprehension questions were also included in the analyses, because it is important for students to understand questions to be able to give correct answers, and get a high score. The comprehension questions tend to paraphrase or use synonyms of the words from the main reading material. In this case, including them might provide a clearer picture on the vocabulary size needed for reading section of the exam.

Several adjustments were made to the original reading materials before analyzing them with the help of LexTutor. Proper nouns and numerals were removed, as they can be easily recognized and understood from the context (Khalifa & Schmitt, 2010; Nation & Webb, 2011).

Phone numbers, websites, and addresses indicated in the advertising leaflets selected for the exam were also removed for the same reason.

5. Results

5.1 Research Question 1
Table 1 illustrates text-coverage percentage on each reading comprehension part of the test. The most frequent 1,000-word families provided an average of 79.5% coverage. The most frequent 2,000- and 3,000-word families provided coverage of 89.5% and 93.5% accordingly. The first aim of the current study was to determine the percentage needed for 98% coverage. According to the results from different years indicated in the table below, the vocabulary size between 6,000-to-15,000-word families was needed to reach this coverage. The results from year 2017 showed that the coverage of 98% could be reached at the point of 15,000-word families, the highest number in the table. The word that was necessary to make up 98% after 97.9% that stopped at 10,000-word band is “homey”, meaning “cozy”.
5.2 Research Question 2
In order to reach 95% coverage, which is claimed to be sufficient enough for comprehension (Laufer, 1989), a vocabulary size of between 3,000-to-5,000-word families was required. The results varied from year to year (see Table 1).

According to the results, the difference between 95% and 98% coverage at their highest is 10,000-word families. The 3% difference gives a number that is way too significant to be ignored. Schmitt et al. (2011) accurately noticed that the level of comprehension decreases remarkably with each percent of unknown words. In order to prepare the students for the exam in the best way possible, this research suggests aiming at the number of word families needed for 98% coverage.

<table>
<thead>
<tr>
<th>Word families</th>
<th>Year 2015</th>
<th>Year 2016</th>
<th>Year 2017</th>
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5.3 Research Question 3
The result from profiling frequency levels of words from six most recent reading comprehension parts of English EIT exam all together (see Table 1; “Years 2015 to 2020”) suggests, that if high-school student knows average of 8,000 most frequent word families, they might achieve 98% of comprehension of the texts given in the test. Considering that passages chosen for the exam are authentic (not written for the language classrooms), the results are in line with the suggestion by Nation (2006), that learning of first 8,000-9,000-word families should become a priority for the learners, as most frequent 9,000-word families, proper nouns and marginal words are needed for comprehension of authentic texts. Laufer (2013) also agrees that the knowledge of about 8,000-word families is required for independent reading.
6. Discussion

Taking 8,000-word families as the best vocabulary size needed for comprehension of the passages given in English EIT, it is important to have a clear picture of how large this vocabulary is, and why it is so important for learners. For the purposes mentioned above, frequency levels and their meanings will be reviewed.

Frequency levels account for the lexical thresholds. They are based on corpus studies researching how frequently words occur in the language. They are measured in 1,000 band levels of word families. According to different researchers, the first 2,000-to-3,000-word families are referred to as high-frequency vocabulary. It is believed that high-frequency vocabulary provides 80% coverage of any written or spoken text (Nation, 2006). The percentage is very appealing to language learners, and makes it their first main learning goal (Horst, 2010). Nation (2006) names 3,000-to-8,000-word families, and Schmitt and Schmitt (2014) label 4,000-to-9,000-word families as mid-frequency vocabulary. Even though there is no agreement between researchers on the exact frames of the mid-frequency vocabulary, they do agree on its importance for proficient language use. The results from their studies showed that knowledge of mid-frequency vocabulary can improve reading, as learners were able to understand English in a range of different topics. Low-frequency vocabulary (above 9,000 word families) is not considered necessary enough to be taught in a classroom environment and suggested to be left to learners to deal with themselves (Nation, 1990).

A recent growing body of research elicits the importance of mid-frequency vocabulary (which is of interest to the current study), as necessary for various purposes of language use, and highlights the necessity of addressing it pedagogically (e.g., Masrai, 2019; Matthews, 2018).

6.1 Teaching Implications

A few teaching implications based on the results of the present study could be suggested. First, the current study suggests that developing a vocabulary knowledge of about 8,000 most frequent word families by the end of high school should be taken into account by the teachers and boards of education when developing an English learning curriculum. Understandably, 8,000 word families might seem like a very large number in the eyes of learners, but mostly in the eyes of the teachers whose responsibility it is to prepare their students for the test. Schmitt (2008) is convinced, however, that “learners need large vocabularies to successfully use a second language, and so high vocabulary targets need to be set and pursued” (p. 353). Considering that there are about 88,000-114,000 word families in English (Nation, 2006), 8,000 most frequent word families does not look as daunting anymore. Moreover, usually English starts to be taught in elementary schools in Ukraine. This gives teachers at least ten years to prepare their students for the exam.

Second, it is being observed that mid-frequency words are often neglected not only by the language instructors but also by the writers of textbooks that are claimed to be developed for high-proficiency learners. The evidence could be found in Matsuoka and
Hirsh (2010), who analyzed a textbook for upper-intermediate level and found that there was a very small number of mid-frequency vocabulary used in texts, the lion’s share was recycling high-frequency words. Setting vocabulary goals helps clearly decide on ways how to reach them. Choosing an appropriate textbook that answers the needs and goals of learners is vital for successful vocabulary acquisition.

Third, 8,000-word families is a large teaching goal, indeed, and might be difficult to fit in the curriculum. However, in this case, teachers could help their students to learn large amounts of vocabulary efficiently by introducing a variety of vocabulary learning strategies. There is a growing number of research suggesting different learning strategies and their combinations, that are believed to lead to positive outcomes (Gu, 2010). Schmitt and Schmitt (1993) compiled a list of 37 vocabulary learning strategies that could be used as a starting point for teachers. Their study suggests that the effectiveness of strategies highly depends on learners’ individuality, learning environment, and study traits. It is recommended to spend time searching for useful strategies.

6.2 Limitations to the study and future research
There are a few limitations to the study. The first limitation is the counting unit. It is assumed that if one member of the family is known, then the rest of the word family members can be recognized and understood (Bauer & Nation, 1993). However, as practice shows, it is not always correct. Mochizuki and Aizawa (2000), for example, reported that even though the vocabulary size of Japanese English learners was large, they had problems with knowledge of the affixes.

The other limitation is the small number of samples. One might suggest, that a corpus of a little over 7,000 words might not be enough for providing clear frames of necessary vocabulary size for the test. It could be a good idea to include also passages from the listening comprehension part of the exam. This would provide additional information on the vocabulary breadth of the test. Many similar studies included listening comprehension in their analysis (e.g., Kaneko 2017; 2020).

The third limitation to the study is that LexTutor does not recognize multi-word units, like phrasal verbs or idiomatic phrases. This is a responsibility of a teacher to make sure that the students have knowledge of the most common multi-word units. Garnier and Schmitt (2015) presented the PHaVE List. This list consists of 150 most common phrasal verbs derived from COCA list. Other lists that language instructors might find worthy of drawing learners’ attention to are the list of core idioms, that can be found across the BNC list (Grant, 2005), and the list of the most frequently used spoken American English idioms (Liu, 2003).

Knowing the required vocabulary size needed for the English EIT, a future study might investigate which 1,000-word bands learners have mastery of.
7. Conclusion

Contribution to reading comprehension is one of the most compelling reasons for the importance of vocabulary learning. Drawing upon the notion of lexical coverage, the first 8,000 word families from BNC/COCA list are needed to provide a coverage of 98% of the reading comprehension part of English EIT. Depending on the test, the difficulty of passages varied, and test-takers might need larger or smaller vocabulary sizes than 8,000 most frequent word families. The results of the current study, however, are in line with other studies suggesting an optimal vocabulary size for comprehension of authentic texts.

Conflict of Interest Statement
The author declares no conflicts of interest.

About the Author
I have been teaching English in Japan for over seven years. Currently, I am a graduate student (TESOL) at Temple University, Japan campus.

References


Iwamoto, M. & Kramer, B. (2020). NGSL coverage of the SHS Entrance Exam and National Central Test. *The Language Teacher, 44*(5), 3-8. [https://doi.org/10.37546/jaltlt44.5-1](https://doi.org/10.37546/jaltlt44.5-1)


Laufer, B. (2013). Lexical thresholds for reading comprehension: What they are and how they can be used for teaching purposes. *TESOL Quarterly, 47*(4), 867-872. [https://doi.org/10.1002/tesq.140](https://doi.org/10.1002/tesq.140)


Appendix A: A passage from English EIT, year 2017

When I told my mother I was going to be a vegetarian she didn’t try to discourage me, she simply said, “Fine, but I’m not making two dinners”. She thought it was a phase, something that I would grow out of. After all, who can live their entire life without eating a hamburger, or the traditional turkey at Thanksgiving? Turns out, lots of people can. Much to my mother’s dismay, I turned out to be one of thousands of vegetarians in who were under voting age. Some people thought I did it to be cool, some people (like my mother) thought I did it for shock value. But I was always asked the one-word question: WHY?
Lots of reasons. I was never a big steak fan, loved animals, and when I was little I had a friend who lived on a dairy farm. If you have ever named a cow, you will understand how difficult it is to sit down to a hamburger. But there was, of course, one fateful encounter that pushed me to my dinner of destiny.
My mother had a friend named Jen. Jen had long brown hair down to her calves. I’m not exaggerating, it was down to her calves. She insisted we go to a natural food store in our town so she could get organic vegetables and soymilk. I had never even known what soy was, or that there was a difference between vegetables from the grocery store and vegetables from a natural food store. And I was amazed. Not only did she have hair down to her calves, but she also knew about foods I had never even heard of. My decision was made.
I feel very fortunate to be a vegetarian in an age where there are so many meat alternatives. My friends and family appreciate that I don’t try to force my food choices on them.
If you are thinking about becoming a vegetarian, it’s important to do a little research first and make sure you maintain a healthy diet. I have met so many junk-food vegetarians (a self-proclaimed vegetarian who doesn’t eat meat, but doesn’t eat anything healthy or remotely close to a vegetable), that I’m not surprised most people think eating vegetarian isn’t healthy.