

The Effect of Word Frequency on Answering Grammar Questions

Zahra Kordjazi

Tehran's University for Teacher Education, Tehran, Iran

Email: Zahra.Kordjazi@gmail.com

Abstract—The present study was conducted to investigate the relationship between word frequency and answering grammar questions. The subjects of the study were 28 female graduates and undergraduates. Two grammar tests each containing 20 questions with low and high frequency words were given to the subjects with an interval of seven days. The questions including rare and common words were distributed randomly in the tests. Paired sample t-test was used for data analysis. The results indicated that there is no relationship between word frequency and answering grammar questions. Being familiar with a rare word or not does not affect learner's ability to deal with a grammar question. This study, in fact, has a complementary role in the research on word frequency.

Index Terms—vocabulary, word frequency, grammar test, memory encoding

I. INTRODUCTION

Vocabulary is central to language. In Crystal's (2003, p. 117) opinion, "vocabulary is the Everest of a language. There is no larger task than to look for order among the hundreds of thousands of words which comprise the lexicon". Frequency is one of the numerous properties of the word. As a matter of fact, "word frequency is a global property. It can be found on the surface of text and is a forerunner of an immense research domain", according to Popescu and Altmann (2009, p. 249).

Truly, word frequency and the difficulty concerning their recall and recognition have been researchers' area of interest for decades. It has been found that "in addition to the advantage of low frequency words at retrieval, there is a low frequency disadvantage during encoding" (Diana & Reder, 2006, p. 805). It means that rare words need more processes to be encoded. Researchers have posited that low-frequency words result in the larger proportion of encoding and thus always have an advantage in recognition (Hall, 1979). On the surface of it, rare words may seem problematic when teaching or testing. But this is not true at all. According to many studies, these words despite their strangeness and less susceptibility would always have an advantage in recognition since they demand more time for encoding. On the other hand, common words are easy to recall due to their familiarity.

Studies which focus on the frequency of words would give rewarding results to researchers from different fields of study including language teaching and psychology. Teachers and testing experts can learn to what extent devote their time and energy to the selection of words while preparing and writing grammar questions. Psychologists, too, can get some hints for further research in the areas of word recognition, mind, recall, attention, and working memory. As these areas are totally intermingled, research on these domains, on the whole, can present new information to language teachers as researchers and thus help them improve their teaching. The benefits of the findings of such studies to language learners are undeniable as well. They may learn to adopt their own strategies learning and answering exam questions by exploring current research in the domain. This of course will guarantee their success. By knowing that "success in memory is commonly attributed to the way information is encoded, stored, and retrieved" they will be able to refocus on their own learning and responding-to-the-task styles and strategies, based on Diana and Reder (2006, p. 805).

A. Research Hypotheses

Null hypothesis: There is no relationship between word frequency and answering grammar questions.

Alternative hypothesis: There is a relationship between word frequency and answering grammar questions.

B. Delimitations of the Study

There are two delimitations that need to be acknowledged and addressed regarding the present study. The first delimitation concerns the size of the population. It could include more participants. The second one is that the participants were female students. It could include males as well for a better result or even comparison.

II. REVIEW OF LITERATURE

Deese (1960) undertook a research to show that a much greater amount of associative interrelatedness characterize high-frequency words than low. Thus, high-frequency distracters used in the recognition test, because of such

interrelatedness, should generate more false positive responses among the high-frequency target words, than low-frequency distracters should generate among low-frequency target words.

It had been hypothesized that comprehension of the meaning of the whole passages will be increased by varying the frequency of 15 percent of words in elementary school reading materials. To test this hypothesis, 222 sixth graders were randomly assigned by Marks, Doctorow, and Wittrock (1974) to two reading treatments differing only in the frequency of 15 percent of the words used in the stories. Reading comprehension was significantly increased with high frequency story texts. Results demonstrated that increases in the frequency of a small percentage of words enhanced story comprehension, while a few less familiar words inhibited comprehension of the whole text. "The data suggest that, in the design of reading materials for use in elementary schools, sizable increases in reading comprehension can be produced by increased attention to the semantic variable of word frequency" (Marks, Doctorow, & Wittrock, 1974, p. 259).

Schulman did a research in 1976 in order to examine the recognition of words of very low frequency. After having these words rated on a 6-point familiarity scale, a recognition test was provided, the results of which revealed a positive relationship between familiarity and the probability of later recognition.

In two experiments Hall (1979) asked seventy undergraduates studying psychology to learn low and high frequency words. After that, he gave them a recognition test which employed either orthographic or general population distracters. The findings proved his predictions. There is a disparity between recognition and recall measures. The findings revealed that although recognition test scores were higher for low frequency target words than for high when general population distracters were utilized, recognition test scores were higher for high frequency target words when orthographic distracters were used.

Graves, Boettcher, Peacock, and Ryder (1980) reported word frequency as a predictor of students' reading vocabularies and the effects of grade, ability, and sex on word knowledge. Subjects, 432 seventh through twelfth grade students, received an 86 item vocabulary test on which each word represented a frequency block of 1,000 words (1st thousand most frequent, 2nd thousand most frequent . . . 86th thousand most frequent). The findings suggested that correct responses tend to decline rapidly with less frequent words but that the relationship between frequency and word knowledge is not a strong one. Findings also showed significant differences due to frequency, grade and ability but none due to sex.

The relationship between word frequency and passage comprehension was examined by Ryder and Hughes (1985). The researchers presented fifths graders with either a high-frequency version or a low-frequency version of a passage on social studies where 25% of the substance words had been replaced with synonyms of either high or low family frequency values. Following the reading of the passages, literal and inferential comprehension measures were obtained. Findings revealed no significant differences between the two passages on either of the comprehension measures.

Although the study of word frequencies has been one of the favorite and most traditional issues in the history of research on language and psychology for almost a century, it has not received any heed from the viewpoint of grammar tests. Research concerning the effect of word frequency on answering grammar questions is lacking, apparently. Current study, thus, investigated whether being unfamiliar with uncommon words affect learner's ability to deal with grammar tests or not.

III. METHOD

A. Participants

Twenty eight female graduates and undergraduates majoring in English Translation, English Teaching, English Literature, biology, geography, and psychology at the same university (Tehran's University for Teacher Education) served as subjects. Not to mention that all of the participants had a good grasp of the grammar of the English language. The age of the participants ranged from 19 to 28. The native tongue and the medium of instruction for these Iranian students were representative of most Iranians.

B. Instrumentation

A multiple choice grammar test with forty questions was prepared. The test was divided into two parts (subtests). This was done so that the subjects could not figure out the similarities between two questions having the same format but differing in one word in the test. Each part included twenty items. One half of the twenty item contained low frequency words and the second half high frequency words. The items were distributed randomly in the subtests. Each subtest also included three demographic questions asking subjects' name, gender, and age.

In preparing the whole test, the first task concerned the selection of the words to be included in the test. High frequency words gathered for the test were common simple words of English that were recognizable for low-intermediate learners. However, the low frequency words were chosen from rare, uncommon, and even archaic words in the English language and were obtained from online pages especially devoted to such words including *Grandiloquent Dictionary* (<http://www.islandnet.com/~egbird/dict/dict.htm>) and *WORDCOUNT* (<http://wordcount.org>).

The test, all together, was a grammar test which intended to assess subjects' grasp of knowledge of English grammar. However, the main intention of conducting it was to examine the relationship between word frequency and the way students answer grammar questions.

C. Procedure

The first part was given to the subjects and then after an interval of seven days the second part was distributed to them. Before the test the researcher asked the participants to fill out the section of the test pertaining to demographic information. Furthermore, the participants were told to choose the incorrect form among the four underlined choices as there was only one error among them.

Time limitation for the twenty eight female subjects was twenty minutes. Students were told that they should respond to the test without discussing the answers with their friends. All of the participants were rewarded for their cooperation, incidentally.

IV. RESULTS

After, grading the papers and counting the scores of items with low frequency words and high frequency words separately, paired sample t-test was used in order to compare the means of the two variables.

SPSS output:

Here is the descriptive statistics of both variables:

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	LOW	10.7500	28	2.2710	.4292
	HIGH	10.3929	28	2.6011	.4916

Based on the findings, the low frequency word test mean score is a little higher than the mean score of the second variable.

The correlation between two variables:

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	LOW & HIGH	28	.676	.000

There seems to be a strong positive correlation.

The results of the Paired Samples T Test:

Paired Samples Test									
		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	LOW - HIGH	.3571	1.9854	.3752	-.4127	1.1270	.952	27	.350

The T value= .952

Degrees of freedom=27

The significance is .350

As the significance value is greater than .05, the null hypothesis is supported. Consequently, there is no relationship between word frequency and answering grammar questions.

A recent imaging study also found that more attention is given to low-frequency words during encoding (de Zubizaray, McMahon, Eastburn, Finnigan, & Humphreys, 2005) because low-frequency words are associated with a larger blood oxygen level-dependent response in the left prefrontal cortex than are high-frequency words (Diana & Reder, 2006).

Based on such findings, it is not difficult to conclude that test takers in the present study were totally aware of the uncommon words (because the particular heed they gave to the rare words) and intentionally neglected them for the sake of answering the grammar questions properly. Seemingly, their minds were entirely occupied with choosing the wrong grammatical form among the four choices given to them. It appears that they were satisfied with just having a shaky grasp of the sentences' meanings for getting focused on the (un)grammaticality of underlined choices.

The fact that low frequency word test mean score is a little higher than the mean score of high frequency word test shows that subjects did better on questions including the rare words. When there are low frequency words, recognition is nearly errorless, claimed Underwood and Freund (1970). Low-frequency words, in fact, are more likely to be associated with correct source judgment than high frequency words (Rugg & Wells, 1995 (cited in Diana & Reder, 2006)).

V. DISCUSSION

The results demonstrably showed that there is no relationship between word frequency and answering grammar questions. Being familiar with a rare word or not does not affect learner's ability to deal with grammar questions.

Despite a couple of delimitations, the findings of this study provide valuable information to language testing experts and language teachers. They will face little problem selecting proper vocabulary for writing grammar tests. A teacher, additionally, should not give teaching low frequency words a miss in the class. The finding may give teachers some hints on preparing teaching materials as well.

Clearly, the result of the study has added something to different dimensions of word frequency such as the role of memory in processing them while answering a grammar test and the hows of testing grammar.

Suggestions for Further Research

Valuable future research can be conducted to find the relationship between word frequency and answering a cloze test. Or to what extent low frequency words may affect learners' reading comprehension. Does the number of occurrence of a particular rare word in a reading text influence the process of *understanding* the text and acquiring that word? can be the research question of further study on word frequency.

Besides, a similar research can be carried out taking into account different parts of speech of particular words with low frequency and consider how students react to and perform differently on the test.

APPENDIX I GRAMMAR TEST (1)

1. Name: -----

2. Sex: male/female

3. Age: ----- years old

Read the following grammar questions attentively. Choose the incorrect form among the four underlined parts. Remember, there is just one grammatical mistake in every item of the test.

1. This was the most popularly selcouth game of the day with both teams trying hard to beat each other.
 2. The umbrella-shaped table was given as a prize to millionth person who bought furniture from that famous shop in Paris.
 3. The cry of the baby with celeste shoes was associated with hunger, wetness, and being lonely.
 4. This house is more than enough large for Grant's family to live quite separately.
 5. He was introduced to pygmachy by a physical training instructor and won the Army Championship on 1954.
 6. Happily, the guide and leader are coming.
 7. Diplomats say she let slides the need to take advices or explain her decisions.
 8. Christmas is often a time when amazing things that happen with accident create joy where there was none before.
 9. The most of what Alice told me was not true and veracious.
 10. They studying cultures should take some units with Dr. Wilson as well.
 11. No one knew that Rachel was a quite and pusillanimous school girl.
 12. No drug charges were ever brought against the gangster, nor was any investigate ordered.
 13. Jack's Spanish teacher was angry at him yammering about the grammar section of the exam that was held last Monday.
 14. If the dishonest men had heard the news that went around about their appearance in the town, they would had buried the body of the saleswoman.
 15. He had so a bad rhinorrhea that he left the meeting early.
 16. Kashcool, a famous Iranian restaurant in Canada, serves too delicious kebabs.
 17. A number of angry and tired employees of a famous office in London was defenestrating the keyboards of their computers in order to show their anger for not getting enough money.
 18. The witch in the story could not turn to stone neither Ben or Edward after catching them with trick and magic.
 19. As he has clinomania he not longer gets up early in the mornings.
 20. It seemed to me that she was in trouble whether Sarah lived yet died.
- Thanks so much for your participation

APPENDIX II GRAMMAR TEST (2)

1. Name: -----

2. Sex: male/female

3. Age: ----- years old

Read the following grammar questions attentively. Choose the incorrect form among the four underlined parts. Remember, there is just one grammatical mistake in every item of the test.

1. This was the most popularly strange game of the day with both teams trying hard to beat each other.
2. The umbraculiform table was given as a prize to millionth person who bought furniture from that famous shop in Paris.
3. The cry of the baby with sky blue shoes was associated with hunger, wetness, and being lonely.

4. This house is more than enough large for Grant's family to be populated by quite separately.
 5. He was introduced to boxing by a physical training instructor and won the Army Championship on 1954.
 6. Happily, the cicerone and leader are coming.
 7. Diplomats say she neglects the need to take advices or explain her decisions.
 8. Christmas is often a time when mind-boggling things that happen with accident create joy where there was none before.
 9. The most of what Alice told me was not true and believable.
 10. They studying ethnology should take some units with Dr. Wilson as well.
 11. No one knew that Rachel was a quite and fearful school girl.
 12. No drug charges were ever brought against the hoodlum, nor was any investigate ordered.
 13. Jack's Spanish teacher was angry at him complaining about the grammar section of the exam that was held last Monday.
 14. If the dishonest men had heard the news that went around about their appearance in the town, they would had inhumed the body of the saleswoman.
 15. He had so a bad runny nose that he left the meeting early.
 16. Kashcool, a famous Iranian restaurant in Canada, serves too toothsome kebabs.
 17. A number of angry and tired employees of a famous office in London was throwing out the windows the keyboards of their computers in order to show their anger for not getting enough money.
 18. The witch in the story could not saxify neither Ben or Edward after catching them with trick and magic.
 19. As he has an excessive desire to stay in bed he not longer gets up early in the mornings.
 20. It seemed to me that she was in trouble whether Sarah lived yet ceased to exist.
- Thanks a lot for your cooperation

REFERENCES

- [1] Crystal, D. (2003). The Cambridge Encyclopedia of Language (2nd edition): CUP.
- [2] Deese, J. (1960). Frequency of usage and number of words in free recall: The role of association. *Psychological Reports*, 7, 337-344.
- [3] de Zubicaray, G. I., McMahon, K. L., Eastburn, M. M., Finnigan, S., & Humphreys, M. (2005). fMRI evidence of word frequency and strength effects during episodic memory encoding. *Cognitive Brain Research*, 22, 439-450.
- [4] Diana, R., & Reder, L. (2006). The low-frequency encoding disadvantage: Word frequency affects processing demands. *Experimental Psychology: Learning, Memory, and Cognition*, 32(4), 805-815.
- [5] Graves, M. F., Boettcher, J. A., Peacock, J. L., & Ryder, R. J. (1980). Word frequency as a predictor of students' reading vocabularies. *Journal of Reading Behavior*, 12(2), 117-127.
- [6] Hall, J. (1979). Recognition as a function of word frequency. *The American Journal of Psychology*, 92 (3), 479-505.
- [7] Marks, C. B., Doctorow, M. J., & Wittrock, M. C. (1974). Word frequency and reading comprehension. *Journal of Educational Research*, 67, 259-262.
- [8] Popescu, I. I., & Altmann, G. (2009). Word frequency studies. Berlin: Walter de Gruyter GmbH.
- [9] Ryder, R. J., & Hughes, M. (1985). The effect on text comprehension of word frequency. *Journal of Educational Research*, 78(5), 286-291.
- [10] Schulman, A. I. (1976). Memory for rare words previously rated for familiarity. *Journal of Experimental Psychology: Human Learning and Memory*, 2, 301-307.
- [11] Underwood, B. J. & Freund, J. S. (1970). Word frequency and short-term recognition memory. *The American Journal of Psychology*, 83(3), 343-351.

Zahra Kordjazi received her B.A. in English Translation from Islamic Azad University, Qaemshahr Branch. She also obtained her M.A. in Teaching English as a Foreign Language from Tehran's University for Teacher Education. Her major research interests include: social semiotics, gender studies, visual literacy, image-based research, multimodality, and sociolinguistics.