Tracing Changes in Turkish Adult Learners' Vocabulary Knowledge

Gülru Yüksel

Department of Foreign Languages Education, Yıldız Technical University, Istanbul, Turkey

Abstract: This study investigates the development of vocabulary knowledge in three dimensions, receptive, controlled productive and free productive, over one semester. It also examines the interrelationship between these dimensions. 32 Turkish university students participated in the study. The participants completed three pre-tests in the first week of the second semester and three post-tests ten weeks later. We found that significant growth occurs in all three dimensions of vocabulary knowledge; the growth is greater overall in receptive vocabulary knowledge; significant changes occur in beyond-2.000 level in free productive vocabulary; receptive vocabulary size is larger than controlled productive vocabulary size at all vocabulary levels; and the gap between receptive and controlled-productive vocabulary size lessens after ten weeks of instruction.

Key words: Vocabulary size · Receptive vocabulary · Productive vocabulary · Adult learner · Second language learning

INTRODUCTION

The process of acquiring a second/foreign language has often been described in terms of the learner's progress. In this process, learners have often overvalued vocabulary knowledge and equated their progress with increase in vocabulary treasure. After the growing realization that total language proficiency is more than grammatical competence, vocabulary knowledge has started to receive attention in second language pedagogy and research over the last twenty years or so [1, 2]. With the developments in the field of computational linguistics [3] an increased interest in vocabulary acquisition studies is observed.

From a review of literature one important observation that emerges is that despite impressive progress and growing interest, a comprehensive theory of lexical knowledge and of vocabulary acquisition is missing [4, 5]. However, one important issue that the researchers and scholars appear to agree is that knowledge of words is more than connecting concepts and labels; vocabulary knowledge is not an all-or-nothing phenomenon [3, 6] and that words are learned incrementally [3, 5, 7]. In line with this phenomenon, lexical knowledge is assumed to consist of some progressive levels, starting with the word recognition and ending with the ability to use the word correctly in free production [8]. Accordingly, vocabulary researchers often distinguish between receptive (passive) and productive (active) knowledge of a word [9, 10]. The distinction is made to differentiate between people who can retrieve second language (L2) words and those who cannot [11].

It is now a known fact that in the process of language acquisition, knowledge of words progresses through various stages in a single learner [4] and that progress in vocabulary learning is not only a quantitative issue. However, vocabulary size rather than depth is the main focus of this study because of three main reasons. Firstly, the findings of previous research indicated that vocabulary size is a good predictor of success in reading and writing as well as academic achievement [3, 12-18]. Secondly, vocabulary is an important component of fluency in speech [19, 20] and learners often associate progress in language learning with an increase in the number of words they know. Thus, vocabulary size can be traced and could be kept as a record of progress. Lastly, investigating the progress of learners' vocabulary size can be an asset to pedagogy. As Webb [21] states knowing students' vocabulary size provides teachers information as to how far those students will be able to understand and to what degree they will be able to use the language. This will give the teacher a more realistic tool to decide how much instruction is needed.

We know very little about the growth of vocabulary knowledge in Turkish EFL students [22-24]. This paper reports the findings of a research which measures university level learners' vocabulary size and their

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Corresponding Author: Gülru Yüksel, Yabancı Diller Egitimi Bölümü, Egitim Fakultesi,
Yıldız Teknik Universitesi, Davutpasa, 34210-Istanbul, Turkey.
Te: +90 212 383 4861.

progress in ten weeks. There is almost no information in the current literature about the adult Turkish EFL learners' lexical knowledge and growth. We have very little idea which words are learnt, the estimated vocabulary size of university level Turkish students, whether the size changes over time and if it does, what the ratio of change is.

The questions of which words should be learnt and in what order have traditionally been regarded as a matter for teachers and materials developers rather than the learners themselves. Research has focused on using word specific criteria such as frequency and range to help teachers make choices about what items to teach to which students. This article suggests that over-reliance on such an approach fails to prepare learners for the unstructured vocabulary input that they will inevitably have to deal with in the course of their studies.

Despite the difficulty of saying exactly how many words there are in English, one other difficulty is estimating the number of words a native speaker knows. Depending on the level of education, it is estimated that excluding the phrases and expressions, the number of words used by native speakers vary between 12,000 and 20,000 [25]. Although no consensus has been reached concerning the vocabulary size needed for second language learners, researchers addressing the issue have suggested various vocabulary threshold estimates for adequate comprehension and successful use ranging from 3.000 word families [26] for 'minimal comprehension', 5.000 word families for reading unsimplified texts [27] to 7.000 word families for comprehension of spoken text [21]. Current learners' dictionaries include more than 40,000 words and phrases which means a challenge for learners nearly impossible to meet.

Tracing the Development in Vocabulary Size: Different research studies have concentrated on estimating the vocabulary size of L2 learners and tracing the development of vocabulary knowledge. There is considerable number of studies investigating the vocabulary size of L2 learners [21, 28-31]. With respect to their participants, these studies can be divided into two groups; 1) those studies that have investigated the vocabulary size of young learners [32, 33] and 2) those that have investigated the vocabulary size of adult learners [34]. Regardless of their age group, the findings of previous studies indicated that vocabulary size grows as proficiency level and exposure to target language increase and that receptive vocabulary size is larger than the productive vocabulary size. Among those studies tracing the development, studies investigating the development in more than one component of word

knowledge are few in number. Laufer [6], for example, examined the gains in three types of EFL vocabulary knowledge receptive, controlled productive and free productive, in one year of school instruction. While she found significant development in receptive and controlled productive vocabulary knowledge, she could not find any significant development in free productive knowledge. Similarly, Horst and Collins [35] investigated the growth of vocabulary over time by measuring free productive knowledge and they found no significant development in productive vocabulary use after 400 hours of instruction. More recently, Zhong and Hirsh [36] examined vocabulary growth in receptive and controlled productive knowledge. They found that both receptive and controlled productive vocabulary knowledge grow significantly after ten weeks of study. As far as our context is concerned, this study is the first study tracing the development of word knowledge in three different components.

This study investigates the development of three components of word knowledge: the receptive knowledge, controlled-productive and free-productive knowledge. The first type entails understanding of words' core meanings. The second is producing words when prompted with a task. And the third is the use of words at one's free will [6]. Different measurement instruments were used to test each.

MATERIALS AND METHODS

The current study seeks to measure the vocabulary size and vocabulary growth of a selected group of EFL students in a university setting over one semester. The study depends on earlier methodology. The focus is on measuring vocabulary size and vocabulary growth over a ten-week period at different levels (2.000, 3.000, 5.000, 10.000 and academic word levels) in terms of both receptive, controlled productive and free productive knowledge. Thus the purpose of the study was twofold; first, to measure the vocabulary size and second to examine the development of three types of vocabulary knowledge -receptive, controlled productive and free productive- over one semester time.

Research Questions: The specific research questions were as follows:

- What developments occur in receptive, controlled productive and free productive vocabulary knowledge over one semester?
- How are the three types of vocabulary knowledge related to one another?

Subjects: A total of 32 first year university students enrolled in the department of English Language Teaching at a Turkish state university participated in the study (24 female, 8 male). All were non-native speakers of English. All of the participants had studied English for a minimum of 4 years. They were required to pass a proficiency exam to enrol the department. Their proficiency level ranged from pre-intermediate to upper-intermediate. During the first year of study, the learners take twelve hours of language courses in English language per week with a variety of teachers, all of whom are also non-native speakers of English. The participants completed three pre-tests and three post-tests 10 weeks later. The ten-week-period represented 120 hours of English language class time.

Instruments and Procedure: In order to measure the subjects' vocabulary knowledge three instruments were used; (1) *Vocabulary Levels Test* [37], (2) *Productive Vocabulary Levels Test* and (3) *Lexical Frequency Profile* [38]. Each of these instruments was used to collect data related to different dimensions of vocabulary knowledge of the subjects. Receptive vocabulary size was measured via *Vocabulary Levels Test*, controlled productive vocabulary size was measured via *Productive Vocabulary Levels Test*. And *Lexical Frequency Profile* was used to measure lexical richness in free written expression.

The *Vocabulary Levels Test* consists of four general vocabulary tests and a university word list (UWL) test. The four general vocabulary tests establish vocabulary levels of 2.000, 3.000, 5.000 and 10.000 word levels. At each level there are 30 items in six clusters. In the test, learners are required to match groups of three words out of six with their paraphrases as illustrated in the example:

Vocabulary Levels Test

- Arrange
- Develop   Grow
- Lean   Put in order
- Owe   Like more than something else
- Prefer
- Seize

The target words are tested in isolation so that no contextual clues are provided [6]. The answers are scored as correct or incorrect and each correct answer is given one -point. Each frequency level section consists of 18 items. There are five sections in the tests, the maximum score is therefore 90. This test is available in four parallel versions. Each version has a sample of items from different frequency levels, yet the items themselves are different. For pre- and post-test two different versions were administered in order to ensure that the subjects see the items just for once.

The test is also used to measure the learner's overall receptive vocabulary command. The method of calculating the estimates of vocabulary knowledge has been adapted from Laufer [6]. The calculation is done as follows: The first 1.000 level and the second are assumed to have the same score. The score for the 4th level is calculated from the average of the 3rd and the 5th levels. The scores for the 6th, 7th, 8th and 9th levels are calculated as an average of the 5th and the 10th levels. All the scores are added and multiplied by 10,000 and then divided by 198 (18 items in 10 levels + UWL). The calculation is based on approximations rather than precise figures, thus it can only serve as a rough estimate of a learner's receptive vocabulary size.

As afore mentioned, controlled productive vocabulary size was measured using the *Productive Vocabulary Levels Test*. This is a cued recall test which involves subjects completing a word in a sentence. In the test the first letters are provided as a cue in order to limit the answers to the target words. Similar to the Vocabulary Levels Test, it tests vocabulary knowledge at five frequency levels. There are 18 items in each of the five frequency level sections. An example is given above:

Productive Vocabulary Levels Test:

- There are a doz eggs in the basket.
- Every working person must pay income t.
- The pirates buried the trea on a desert island.

The test of free productive vocabulary consists of two compositions of about 300-350 word tokens and its analysis in terms of *Lexical Frequency Profile*-LFP [38]. The LFP shows the percentage of words that a learner uses at different vocabulary frequency levels in his writing [39]. The calculation is done by a computer program which matches vocabulary frequency lists with a text and the typical output gives the vocabulary profile in four bands: the percentage of basic 1.000 words, the percentage of the 2.000 words, the percentage of in UWL and the percentage of words 'not in the lists' (NiL). NiL vocabulary is considered all vocabulary that is beyond 2.000 word families [39]. One of the advantages of this program is that it is based on the same word frequency list as the Vocabulary Levels Test described above. This makes direct comparisons possible and meaningful. While typing the compositions into the computer for the LFP analysis, in order to make the word recognizable by

the computer the spelling errors were corrected, the proper nouns and semantically incorrect words were omitted.

The pre and post-test measurements were given during three different lessons within the same week (the first week of the semester for the pre- and the last week of the semester for the post-test). They were presented to students as part of their normal class work. For the vocabulary levels tests the subjects were given 40 minutes to complete the test. The time allocated to composition writing was 60 minutes.

The instruments used in the study were found to be valid tests of vocabulary size. The receptive and controlled-productive vocabulary tests have produced a reliability based on the Cronbach alpha figures above 0.90 [40]. Both tests measure vocabulary knowledge at the same frequency levels (2.000, 3.000, 5.000 and 10.000) [41] which allows a direct comparison between receptive and productive knowledge at each level.

For the statistical analysis pre- and post-test scores obtained from vocabulary tests and the percentages of words in four levels obtained from the LFP analysis of the two compositions written by the same learner were compared using paired *t*-test. To test the relation between the three dimensions of vocabulary we correlated the results using *Pearson* correlation.

RESULTS

To answer the first research question, the pre- and post-test results were compared using *t-test*. Tables 1, 2, 3 and 4 present the results of the t-test analysis. The frequency level scores for receptive and controlled-productive vocabulary tests are out of 18, the total are out of 90. A detailed and a condensed version of the LFP scores are given in percentages (Table 3-4). With free productive vocabulary two types of lexical profiles are presented. Table 3 presents a detailed profile with mean percentages of words at each of the four frequency levels. Table 4 presents a condensed profile in which the percentages of words are given as 'basic 2.000' and 'beyond 2.000' words.

As Table 1 shows in all frequency levels and in total receptive vocabulary knowledge a significant increase was found in one semester (p<0.05). When compared to other frequency levels, increase in 3.000 level was the lowest, yet statistically significant. If the raw scores are converted into word families using the calculation method mentioned earlier, the total of 62,71 represents roughly 6600 word families and 70,15 represents 7500 word families. This means that subjects added about 900 word families to their receptive vocabulary. In

percentages, there was 13 per cent growth in the total receptive vocabulary in one semester. At each frequency level the gains in percentage is 50% for 10.000, 9% for 5.000, 2.5% for 3.000, 5.7% for 2.000 and 14% for the UWL level.

Table 2 presents pre- and post-test comparisons of controlled-productive vocabulary size. The results show that in total controlled-productive vocabulary size has also increased. As for the frequency levels the difference is significant in 2.000, 3.000 and UWL levels (p= .003, .025 and .01 respectively). Similar to the receptive vocabulary size estimates we calculated the controlled-productive vocabulary size estimates. In the raw scores the total of 36.46 represents roughly 3640 word families and 41.96 represents 4140 word families, which means that subjects added about 500 word families to their controlled-productive vocabulary. In percentages, there was 13 per cent growth in the productive vocabulary in one semester. At each frequency level the gains in percentage is 28% for 10.000, 9% for 5.000, 23% for 3.000 and 8% for 2.000. As for the UWL level, we found 20 per cent gain.

As can be seen from Table 1 and 2, the growth in receptive and controlled-productive vocabulary knowledge is not identical. The receptive scores were higher than the controlled-productive scores. This finding indicates that the participants have partial productive knowledge of words they know receptively. However, with regard to frequency levels, the largest growth in vocabulary size over ten weeks occurred in 10.000 level and UWL in both receptive (50% and 14% respectively) and controlled-productive vocabulary (28% and 20% respectively). In order to see the relation between receptive and controlled productive knowledge of the participants, we calculated the ratio between the two both for the pre and post-test (controlled-productive/ receptive). For both tests the ratio was 55. This finding indicates that both for the pre- and post-test the receptive vocabulary knowledge of the participants was larger than their controlled-productive vocabulary knowledge. Since the pre-test ratio is equal to that of post-test, this suggests that the gap between receptive and controlled-productive vocabularies was wide and that the learners have not started to use the newly learned words productively.

Table 3 displays the pre and post-test comparisons of free productive vocabulary. The results show that free productive vocabulary size of the subjects changed significantly in 1.000 and UWL levels. Although we see an increase in not-in-the list (NiL) level, it was not statistically significant. The results show that after one semester the proportion of the most frequent words

Table 1: Pre and post-test receptive vocabulary *t-test* results

	Pre-test (n=32)		Post-test (n=32)		Difference	
	Mean	SD	Mean	SD	t	p
UWL	11.96	2.456	13.65	2.14	-5.90	.000**
10.000	6	3.04	9.25	3.61	-5.66	.000**
5.000	12.87	2.58	14.06	2.78	-3.19	.003**
3.000	16.09	1.51	16.50	1.60	-2.20	.035*
2.000	15.78	1.33	16.68	1.22	-5.52	.000**
Total	62.71	8.32	70.15	8.53	-12.11	.000**

Table 2: Pre and post-test controlled-productive vocabulary *t-test* results

	Pre-test (n=32)		Post-test (n=32)		Difference	
	Mean	SD	Mean	SD	t	p
UWL	6.68	2.62	8.03	3.37	-2.60	.01*
10.000	1.46	1.31	1.87	1.77	-.96	.34
5.000	5.96	2.25	6.50	1.98	-1.45	.15
3.000	8.87	3.98	10.93	3.03	-2.35	.025*
2.000	13.46	2.55	14.62	2.01	-3.26	.003**
Total	36.46	9.22	41.96	8.85	-6.11	.000**

Table 3: Pre and post-test lexical profiles *t-test* results

	Pre-test (n=32)		Post-test (n=32)		Difference	
	Mean	SD	Mean	SD	t	p
UWL	3.25%	1.83	5.43%	2.63	-6.86	.000**
NiL	2.03%	1.37	2.66%	1.73	-2.03	.051
2.000	3.53%	1.43	3.79%	1.56	.063	.93
1.000	91.12%	2.58	88.28%	2.60	7.61	.000**

Table 4: Pre and post-test comparisons of condensed profiles

	Pre-test (n=32)		Post-test (n=32)		Difference	
	Mean	SD	Mean	SD	t	p
Basic 2.000	94.65%	2.48	91.84%	2.61	6.85	.000**
Beyond 2.000	5.34%	1.99	8.09%	3.30	-5.84	.000**

p<0.01

Table 5: A summary of changes in vocabulary

	Receptive	C-productive	F-productive (beyond 2.000)
	------------------------------*(in word families)*------------------------------		
Pre-test	6600	3640	5.34%
Post-test	7500	4140	8.09%
Change in %	13%	13%	51%

C-productive: controlled productive; F-productive: free productive

Table 6: Correlations between receptive. controlled-productive and free productive vocabulary

		C-productive		F-productive Beyond 2.000	
		r	p	r	p
Pre-test	Receptive	.354*	.047		n.s
	C-productive				n.s
Post-test	Receptive	.585**	.000	.365*	.040
	C-productive				n.s

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed)

decreases, whereas the percentage of UWL increases significantly (p <.000). 2.18% increase in the mean scores of UWL level actually represents 67% increase within that level.

Table 4 shows the distribution of basic 2.000 and beyond 2.000 vocabularies. The condensed lexical profiles indicate a statistically significant change in one semester. While 3.08% decrease is observed in the distribution of basic 2.000, 3.08% increase is observed in the beyond 2.000 vocabulary level.

Table 5 displays a summary of the changes in three dimensions of vocabulary knowledge. The 51% change in beyond-2000 level of free productive vocabulary might be due to the learners' extra effort to increase their academic vocabulary knowledge. The high increases in per cent in UWL level (both in receptive and controlled-productive tests) strengthen this implication. As for the receptive and controlled-productive vocabulary, the gains are equal.

As for the second research question seeking the relation between the three types of vocabulary

knowledge, we correlated the receptive, controlled-productive and beyond 2.000 scores for both tests. Table 6 presents the correlations found.

Table 6 presents the Pearson correlation analysis results. The shows that receptive knowledge, in both pre- and post-tests, is correlated with controlled-productive vocabulary. While the correlation is low but statistically significant in pre-test (r=.35), it is moderate and statistically significant in post-test (r=.58). As for the relation between free productive vocabulary (beyond 2.000) and other two dimensions, we could not find any relation between the three in pre-test. In the post-test we found a low but statistically significant relation between the receptive and the free productive vocabulary (r=.36). This indicates that the increase in receptive vocabulary knowledge has positively affected the use infrequent vocabulary in a free writing activity. However, controlled-productive vocabulary in both tests is not correlated with the free productive vocabulary.

DISCUSSION

This study has traced changes in vocabulary knowledge over ten-week time. In research question one, we asked what developments occurred in the three types of vocabulary knowledge over one semester. The findings of the pre- and post-test comparison analysis indicated that in total scores all three types of vocabulary knowledge grew after ten weeks of instruction. Similar to previous studies, we found that in receptive and controlled-productive vocabulary the size increased as frequency decreased [6, 21]. While the changes were significant in all levels in receptive vocabulary, changes in controlled-productive vocabulary were statistically significant at the 2.000, 3.000 and UWL levels. These findings are partially in line with the previous studies. In her study, conducted in a high school in Israel, Laufer [6] found statistically significant changes in all levels in receptive and controlled-productive vocabulary sizes. In her study there was 84 per cent growth in the receptive and 50 per cent in the controlled-productive vocabulary. In our study, in both of these vocabulary types the gains in per cent were 13. Although the gains in per cent seem to be lesser than the gains in Laufer's study, the increase in receptive vocabulary size of the participants in this study is 900 word families in total. This means that the average vocabulary gain per week was about 33 word families. With respect to the academic vocabulary the change was 14% which represents 126 word families. The study shows that Turkish ELT learners increase the number of words they know receptively over time. This finding is in consistent with the study of Laufer [42] in which university students of engineering acquired 300 word families in one semester. In another study in which vocabulary learning in lists is

experimented Nation [9] reports impressive gains over a period of hours. Similarly, our results indicate learners' progress in receptive vocabulary size; however, this might not be an encouraging figure when compared to the vocabulary knowledge of an adult native speaker. Goulden, Nation and Read [43] report 20.000 word families for a 21 year old English speaking university graduate. Our findings might be resulting from the fact that the participants in the study were traced only one academic semester.

Our findings, with respect to controlled-productive vocabulary, also indicate gain in this type. However, the results did not exhibit a picture similar to that of receptive vocabulary. Although the gains as expressed in per cent indicated that our students have started to use more than half of their receptive vocabulary at 10.000, 3.000 and 2.000 frequency levels in controlled-productive task, the gains were not statistically significant at 5.000 and 10.000 frequency levels. A similar result was found by Zhong and Hirsch [36]. In their study conducted with university level students in China, they found significant changes only at two frequency levels (3.000 and academic vocabulary levels) in controlled-productive vocabulary. The insignificant differences at 5.000 and 10.000 levels in our study may result from our learners' insufficient word knowledge. They may recognize words at these levels, but may not use them productively. Moreover, the results of the receptive test indicate that they are still storing words receptively. They might be at a stage that they have not fully mastered these new words.

With regards to free productive vocabulary, we found significant decrease in 1.000 frequency level and increase in UWL level. This finding indicates that our learners show en effort to use more academic words in their free writing tasks. Still, when compared to the progress in receptive and controlled-productive vocabulary knowledge, this progress shows that our learners need more time and instruction in order to put their knowledge into use. This slow progress in free productive vocabulary may be the result of incentive to use more advanced and infrequent words in their writings. Yet, it should be noted that this usage did not come close to the profile of argumentative prose produced by native speakers. In a study by Laufer [42] it was found that the beyond 2.000 words of first year university students is about 13 per cent while that of native speaking high school graduates is 23 per cent. We can say that when compared to these figures, our learners' performance did not progress much.

As for the relation between receptive and productive vocabularies, the ratios calculated support the common assumption that receptive knowledge is larger than productive knowledge [6, 21, 44]. In the correlation analysis, unlike the study conducted by Laufer [6], we found a significant correlation between the receptive and

controlled-productive (in both pre- and post-test) and between the receptive and free-productive in post-test. Although the results did not indicate strong correlations, we believe that they were signalling relations. 14 per cent increase in receptive UWL level resulted in a 3 per cent increase in free production. This may be resulting from the academic focus within the syllabus.

CONCLUSION

The research questions examined in this study concerned tracing changes in three dimensions of L2 vocabulary knowledge over a ten-week period. The current study examined one group of participants. The participants were university level Turkish students enrolled in ELT Department at a state university. Participants' receptive and controlled-productive vocabulary size was evaluated by obtaining a measure of their knowledge of words from different frequency bands and by estimating their vocabulary size. Participants' free productive size was measured by LFP. It was also of interest to the researcher to find out the relation between these three dimensions of vocabulary knowledge.

The study showed that gains observed in all three dimensions of vocabulary knowledge after a ten-week instruction. However, gains in receptive and controlled-productive vocabulary were not truly reflected in lexical profiles of free writing. A possible explanation of this finding is that the gains found in our study were insufficient for any effect on free expression. Learning new advanced vocabulary will not automatically result in the learner's ability or wish to vary the old and new learned words effectively. The learners may need larger receptive vocabulary to reflect in free production. The findings of the study also suggest that the gap between receptive and controlled-productive vocabulary size lessens even after ten weeks of instruction. Longer hours of instruction may result in greater changes at all frequency levels. Further research tracing the changes longitudinally might be conducted as a follow-up. The study might be repeated for different types of learners using different test tools as well.

The present study has provided some empirical data evidencing growth in vocabulary size of university level Turkish foreign language learners. Researchers might also want to focus on the depth of learners' lexical knowledge. There is no doubt that learners need depth as well as breadth in their vocabulary in order to communicate adequately in a foreign language. In addition to having a large vocabulary, learners must also know quite a lot about the words in their vocabulary. To this happen, as suggested by Shirazi and Yamini [45] "teachers should incorporate various vocabulary teaching activities to cover all aspects of vocabulary knowledge" (p. 671). By this way, deep word knowledge will likely to promote the

speed and automaticity with which words can be accessed and activated for receptive and productive use. More research is needed into the role of vocabulary depth.

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