

# Inquiry into the decomposition view of lexical competence

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Psycholinguists are interested in how words are stored in human memory. The question as to whether words are stored as single root words or whether they are stored along with the affixes still remains a controversial issue. Aitchison (1987) believes that each word has a separate entry. Mackay (1978) and Taft (1981) hold that words are made of constituent morphemes. When we listen, we decompose the morphemes and when we speak, we combine them to make multimorphemic words. The decomposition view claims that only the root is stored in memory. To test this claim, a group of 50 intermediate level students at the preparatory department of a state university situated on the western coast of Turkey were selected. They were taught 10 pseudo root nouns and verbs and 10 pseudo complex nouns and verbs. To see how the morphological complexity affected lexical access and which type of words were better remembered, they were tested on these words. Then the same group was given 10 root and 10 complex words in their mother tongue and their answer times were compared. Students recalled the root words more easily and accurately. The results shed light on the validity of the decomposition theory, showcasing we remember the words in roots better.

**Keywords:** Lexical access, the decomposition view, morphological complexity, priming, language learners.

## 1. Introduction

Learning a ‘word’ typically involves learning more than one form–meaning mapping. As Boers (2013, p. 209) states vocabulary knowledge is beyond single words.

Since the advent of corpus linguistics, it has become increasingly evident that most words prefer the company of some other words over that of near synonyms. This Idiom Principle – as opposed to the Openchoice Principle (Sinclair, 1991) – shows up in a panoply of word partnerships and multiword units, such as collocations (make an effort, a warm welcome, utterly disgusting), compounds (peer pressure, love handles), multiword verbs (turn up, follow through with), social interaction routines (nice to meet you, how are you doing), clichés (live and learn, publish or perish), idioms (jump the gun, close ranks), and discourse organisers (on the other hand, having said that).

On daily tasks lexical access is transparent and unconscious (Taft & Forster, 1975), speakers are not even aware of how they choose the lexical items to convey their thoughts, feelings and ideas. Spoken words have phonological structures and follow the rules. Languages have rules for what constitutes permissible strings of sounds in

syllables and words (Lewis, 2000). Starting by birth, we are exposed to such lexical items that fit into the rules and we manage to access them. There are five factors affecting lexical access (Jay, 2003, p. 120):

a) **Frequency:** Lexical frequency deals with how speakers take time to monitor lexical items. Low frequency words take long time to process and high frequency words are easily accessed and frequency plays a pivotal role in lexical access. Lexical frequency deals with how speakers take time to monitor lexical items. Low frequency words take long time to process and high frequency words are easily accessed and frequency plays a pivotal role in lexical access.

b) **Semantic priming:** The second feature is semantic priming. When a word is presented, it activates a semantically related associate. Word associations affect lexical access strongly. The focus is on the semantic relatedness of the words. A related word will prime or speed up the recognition of the second. A word like *cheese* is judged faster when it is primed with *bread* rather than when it is primed with *teacher*.

c) **Concreteness:** The third aspect is concreteness. All words evoke imagery but concrete words leave indelible traces in the minds better. Concrete words like *chair*, *teacher*, *apple* evoke more concrete images than words such as *justice*, *democracy*, *pain*. Bleasdale (1987) focuses on the impact of the concreteness on recalling the lexical items and finds consistent evidence of an advantage of concrete words.

d) **Emotional content:** The fourth aspect, emotional content, helps the recovery of the words. The affective lexicon, such as *like*, *love*, *enjoy* are easily accessed. Vakoch and Wurm (1997) maintain that words in the general lexicon are assembled by meaning but their emotional properties are secondary. Dimensions are evaluation (good-bad), activity (active-passive) and potency (strong-weak). These dimensions are used as they contribute to the survival of the organism. They state that a sense of danger is activated when the words connote strength, badness and quickness.

e) **Morphological complexity:** The last feature is morphological complexity. Here there are two ideas about accessing the words: they are stored as roots or multimorphemic words. When we produce or comprehend a lexical item, we do it as a whole not via root words. The other hypothesis is that words are made up of constituent morphemes that function as small units (MacKay 1978; Taft, 1981). When we listen to something, we break down and decompose words into their small units. When we speak, we recombine morphemes to make multimorphemic words. The decomposition view holds that we only store roots in memory.

The purpose of this study is to investigate whether the decomposition theory holds true or not and whether there are gender differences in lexical storage of multimorphemic words. Two hypotheses are tested:

- 1) The decomposition theory is still valid.
- 2) Female learners are better at the lexical achievement tests than male ones.

## 2. Methods

### 2.1 Participants

A group of 50 students (30 males and 20 females) aged between 18-20 at the preparatory department of a state university located on the west coast of Turkey volunteered to participate in the study. They were enrolled at the engineering departments and took English as a compulsory course.

### 2.2 Instruments

After getting consent forms, the participants were taught 10 pseudo root nouns and verbs, and 10 pseudo complex nouns and verbs as the meanings of nouns and verbs are more easily and concretely expressed rather than adjectives and adverbs (see Table 1 below). Then to see how the morphological complexity affected lexical access and which type of words were better remembered, they were tested on these words online for 5 seconds. The online test with gap filling questions was prepared in such a way that if a student could not answer the gap filling question in 5 seconds, the next question showed up. The pseudo words were selected from Chinese as Chinese lends itself to root and multimorphemic words easily. The words chosen are listed below. The researcher used the same vocabulary teaching lesson plan consisting of lead-in, clarification of meaning, contextualization, repetition and personalization for all the words. The example for the gap filling question was “There are 12..... in a year”.

Table 1 Pseudo words taught to the participants

Root words	Complex words
Yuè (month)	Piàoliang (beautiful)
Chī (eat)	Bùcuò (not bad)
Zhōu(week)	Hǎokàn (good looking)
Hē (drink)	Zǎoshàng hǎo (good morning)
Néng (can)	Wǎnshàng hǎo (good evening)
Yòng (use)	Hǎochī! (delicious)
Zuò (do)	Xihuān (like)
Zǒu (go)	Fǎngǎn (dislike)
Lái (come)	Gāoxìng (happy)
Chu (go)	Shāngxīn (sad)

The same students were given a reading passage to read twice a week later. Then they were tested to see how quickly they responded to ten Turkish root and complex words online within 5 seconds.

### 3. Results and discussion

The reliability of the pseudo vocabulary test was found to be .857, which is quite high and the reliability of the Turkish vocabulary test was .930. In the test, only 5 root and 5 complex words were questioned and students were asked to fill in the gaps. In Table 2, the first 5 questions were about the root words and the last 5 were complex.

Table 2. Descriptive statistics for the pseudo words

Questions	N	Min	Max	Mean	Success rate %
q1	50	,00	1,00	,87	43
q2	50	,00	1,00	,68	34
q3	50	1,00	1,00	1,00	100
q4	50	1,00	1,00	1,00	100
q5	50	,00	1,00	,81	40
q6	50	,00	1,00	,87	43
q7	50	,00	1,00	,75	37
q8	50	,00	1,00	,81	40
q9	50	,00	1,00	,93	46
q10	50	1,00	1,00	1,00	100

When the means are compared in Table 2, it is seen that all students answered two root words (q3 and q4) and one complex word (q10) accurately. However, overall, the means of the first 5 words (root words) were higher than those of the complex words (4.36 versus 3.36).

Table 3. Descriptive statistics for the Turkish words

Questions	N	Min	Max	Success rate (%)
q1	50	1,00	1,00	100
q2	50	1,00	1,00	100
q3	50	1,00	1,00	100
q4	50	1,00	1,00	100
q5	50	1,00	1,00	100
q6	50	1,00	1,00	100
q7	50	1,00	1,00	100
q8	50	,00	1,00	75
q9	50	1,00	1,00	100
q10	50	1,00	1,00	100

The descriptive results of the Turkish test in Table 3 show that students did not have any variation and except for one complex word in the 8th question, they answered all the words correctly within the given amount of time (5 seconds).

To find out whether gender played a role or not, a t-test was conducted and the significance (p value) was found to be .000 in Table 4, which showed girls to be more successful in the vocabulary recognition test.

Table 4. One-sample test for gender

	Test Value = 0				
	t	df	Sig. (2-tailed)	Mean difference	95% Confidence interval of the difference Lower Upper
<b>Gender</b>	10,9	15	,000	1,312	1,054 1,567
<b>Total</b>	50,3	15	,000	8,750	7,60 9,892

The first research question as to the success level of the root words whether students remember the root words more clearly or not highlights the validity of the decomposition view because of their overall means (4.36). Lexically speaking, the words are structurally categorized into root, complex and compound, and cognitive psycholinguists believe that we either have one word entry for each word or different entries. A word family consists of a lemma and its derivations. For example, argue, argues, argued, arguing, argument, arguments, arguable, argumentation and argumentative make up one word family. It is sometimes assumed that if a learner knows one member of the family, its relatives will be understood as well. This, however, cannot be taken for granted and this current study shows that even complex words such as “gāoxìng” can be retained in mind without prior knowledge of the root words and this is in line with the arguments by Schmitt and Zimmerman (2002). In the related literature there is great inconsistency. While Rueckl and Rimzhim’s (2011) and Perea and Carreiras’s (2006) findings suggest that there is a direct access route to the representations of the whole word, Christianson et al. (2005) and Duñabeitia et al.’s (2007) results suggest that there is not. This study’s data shows that morphologically complex words can be accessed as full forms. Of course, it should not be concluded from this that morphologically complex words are not decomposed. As outlined earlier, there is a large body of evidence in favour of morphological decomposition (Longtin & Meunier, 2005; Rastle et al., 2004). Our results are rather in line with models of visual word recognition that emphasize the simultaneous activation of whole-word and morphemic representations. Hence, the hybrid model can be considered in lexical recognition: word recognition can be achieved in parallel through a whole-word route as well as a decompositional pathway to maximize the reader’s chances of successful word processing through simultaneous use of all mechanisms available to them.

The other research question aimed at seeking to investigate if gender had any significant effect on language learners’ vocabulary learning. Therefore, a null hypothesis was formulated to answer this question. The results indicate that there was a

statistically significant difference between male and female learners regarding their vocabulary scores to the advantage of the female learners (p value is ,000). Hence, the result is in line with previous research which demonstrates gender differences in several areas of vocabulary acquisition (Jiménez, 1997; Jiménez & Moreno, 2004; Jiménez & Ojeda, 2008).

Bowers and Kirby (2010) conclude that “morphological instruction should be organized to facilitate students’ ability to identify the bases of words” (p. 534), similarly to Kuo and Anderson (2006) who found that identifying stems is the morphological skill most related to reading development particularly in the elementary grades.

#### **4. Conclusion**

This study aimed at investigating primarily whether the decomposition theory is applicable in L1 and L2, and, secondly, whether there are gender differences in the achievement scores of the students. The results yield that students recall the roots better, which paves the way for a convergence between constructivism and contextual vocabulary teaching. Moreover, the evidence presented in the present work provides clear constraints on theories of how readers process morphologically root and complex letter strings. It is easy to argue that morphologically complex words can be directly retrieved as full forms but overall results are consistent with the theory that morphologically complex words are decomposed at early prelexical stages in visual word recognition, which is inconsistent with the studies of Giraudo and Grainger (2001, 2003) and Beyersmann, Coltheart and Castles (2012).

Although an increasing number of studies have argued for viewing vocabulary knowledge as multidimensional (Henriksen, 1999; Laufer et al., 2004), memory and morphemic structure play a crucial role. If there is an emphasis on the morphophonemic units in the classroom instruction, this facilitates the vocabulary learning process. All in all, any statement of the word as the unit of meaning requires a sophisticated approach to include the morphemes. To quote Nation (2001) the main advantage of chunking is speed whereas the disadvantage is storage. As long as learners have this storage, namely, memory, they can quickly learn the contextualized morphemic words.

Recognizing a word is seen as partly a memory-driven process, in which words from the recently read text and the propositions they encode are highly accessible in memory. A word, as it is read, resonates with these memories, and connections are made without an active construction process, which can later tune and correct the representation. This process is adaptive for comprehension insofar as what is activated in memory is relevant and consistent with the morphemic units of the word, which can, in return, continue to exert an influence on comprehension (O’Brien, Cook, & Guéraud, 2010; O’Brien et al., 1998). Theoretically, the argument of this study entails a closer view of the interaction between the word identification system and the comprehension

system that is mediated by decomposition view and memory and manifest in word meaning processing.

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