

The Morphologically Organized Mental Lexicon: Further Experimental Evidence

The issue: In theoretical linguistics, the notion of a morpheme as a discrete stored linguistic unit is not uncontroversial.ⁱ Nonetheless, there is general agreement among linguists that lexical items are related to one another via rules or the equivalence of rules that amount to morphological relationships. Outside the field of linguistics, however, cognitive scientists have argued that morphological relationships are, in fact, simply the by-products of semantic and phonological overlap between items: morphology is epiphenomenal.ⁱⁱ

Overview: Though many predictions stemming from these two perspectives depend on the specifics of the models used to implement them, an experimental paradigm called repetition priming has been used as a means of addressing the general divide. I take up this paradigm, modifying it to address confounds in previous work. Specifically, I test the hypothesis that semantic and phonological overlap are sufficient to account for previously obtained priming results using as stimuli morphologically related words in which semantic and phonological overlap are minimal. Morphological priming is obtained where semantic and phonological priming are not. These results constitute further experimental evidence in favor of a morphologically-organized mental lexicon.

Paradigm: In lexical priming experiments, participants see or hear a string of letters/sounds (the *prime*) followed by another string (the *target*). They are asked to identify the target as quickly and as accurately as possible as a real word of their language or as a non-word, usually by a button press, and their accuracy rate and reaction times are recorded. The basic idea behind priming is that lexical representations are accessed when a receiver hears or sees a string of sounds or letters that correspond to that representation. Residual activation from accessing that lexical representation will linger, such that subsequent exposure to the same representation should result in faster access.

Indeed, researchers have found that repetition of the probe as target is facilitatory, i.e. results in speeded reaction time to the target: *happy* primes *happy*. Interestingly, morphological derivatives of a stem also prime that stem: *happiness* primes *happy* (Marslen-Wilson et. al. 1994). Can this be considered evidence for morphologically based lexical representations that are decomposed into their constituent parts, i.e. is the *happy* in *happiness* identical to the *happy* in *happy* or do the semantic and form representations of *happy* just overlap with *happiness* to some significant degree without having to refer to morphology per se?

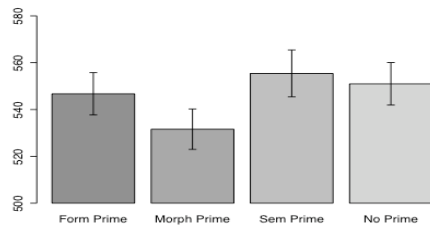
Present Study: Previous work has confounded semantic overlap with shared morphology.ⁱⁱⁱ The present study exploits the observation that *delayed* repetition priming does *not* yield semantic effects.^{iv} Delayed repetition displays the target several items after the probe (an average of 20 items in the current experiment). At this lag, there are no priming effects of semantic or formal relatives: *joy* does not prime *happiness* as it does when the target immediately follows the probe, and *hapless* does not inhibit *happiness* as in immediate repetition. Recent work on French stems^v shows that morphologically related words, however, continue to prime one another even with the delay in target presentation.

I further establish delayed repetition priming as a reliable paradigm for assessing whether or not strings are psychologically represented as constituents, i.e., as salient manipulable chunks. This research focuses on the representation of suffixes, which are morphemes in the traditional sense, but provide little semantic or formal overlap with other words that share them. Further, suffixes are often considered the least likely candidates for independent representation in the mental lexicon. Assuming linear processing, it is rarely necessary to hear an entire suffix before being able to identify a word, therefore, the advantage of representing suffixes as unique constituents is not immediately obvious. Nonetheless, in the delayed repetition priming paradigm, I find that derived words that share a suffix significantly prime one another (*happiness* primes *darkness*) where their semantic and form relatives do not. Again, this is particularly striking since the related words overlap minimally semantically and formally. These results show the psychological salience of suffixes as manipulable chunks and provide further evidence for a morphologically organized mental lexicon.

Table 1: Mean decision latencies from Delayed Repetition Suffix Priming

Condition	Example	Mean RT(ms)	StdError(ms)	Priming(ms)
No prime	<i>heroism</i>	551.6	9.1	(baseline)
Morphological	<i>humanism –heroism</i>	531.6	8.6	+20
Formal	<i>heresy – heroism</i>	546.5	9.0	+5.1
Semantic	<i>valor – heroism</i>	555.5	10.0	-3.9

Table 2: Results of Delayed Repetition Suffix Priming Experiment



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ⁱ Item-as-Process and Word and Paradigm theories offer alternatives to this view (cf. Anderson 1992, Steele 1995, Stump 1992, 2001).

ⁱⁱ Notably, Seidenberg 1993, Gonnerman 1999, Plaut and Gonnerman 2000.

ⁱⁱⁱ Marslen-Wilson, et. al. 1994, 1996 a.o. See Feldman 2000 for some discussion.

^{iv} Henderson, Wallace, and Knight 1984.

^v Kouider 2002