

Root-letter priming in Maltese visual word recognition

Native words in Semitic languages typically consist of two discontinuous morphemes – a consonantal root (e.g., *l-š-n* in Hebrew *malšin* ‘informer’) and a vocalic and consonantal pattern (e.g., *ma12i3* in Hebrew *malšin* ‘informer’) – which recur in related words (e.g., *l-š-n* recurs in *lašon* ‘tongue’). Experimental research in Hebrew (Frost *et al.* 1997, 2000, 2005; Deutsch *et al.* 1998) and Maltese (Twist 2006) visual word recognition implicates morphology in the structure of the Semitic lexicon: in lexical decision tasks, readers judge the lexicality of real words faster following subliminal exposure to another word sharing its root. Moreover, Frost *et al.* (1997) found that exposure to a Hebrew word’s root-letters in isolation facilitates its recognition, suggesting that roots themselves have lexical representations that are activated during reading. However, because Hebrew orthography permits purely consonantal strings as written words, Hebrew readers may maintain representations consistent with Hebrew roots because they constitute possible words, not because of their morphemic status. Such effects thus would be more convincing in a language in which consonantal strings cannot comprise words. Maltese is unique among Semitic languages in using the Latin alphabet and requiring that all vowels are written; roots thus comprise illegal non-words to which readers are never exposed. Consequently, Maltese provides optimal testing conditions for abstract morphological representation in the Semitic lexicon.

We report the results of a lexical decision experiment in which native Maltese speakers judged the lexicality of 48 written Maltese words of Semitic origin and 48 Maltese words of non-Semitic origin, along with an equal number of non-words. Stimuli were presented using the visual masked priming paradigm (Forster and Davis 1984). Real-word targets occurred in four priming conditions: a repetition condition (e.g., prime *firex*, target *FIREX* ‘to spread’), a root-letter condition (e.g., prime *frx*), a two-letter overlap condition (e.g., prime *grx*), and an unrelated/control condition (e.g., prime *qtl*). All targets contained three distinct consonant graphemes; for non-Semitic targets, the “root” was these three consonants. Response times (RTs) from 77 participants were analyzed using separate linear mixed-effects regression analyses for Semitic and non-Semitic real-word targets, with significance assessed using likelihood ratio tests.

Subjects responded significantly faster to Semitic targets in the repetition ($\chi^2(1)=50.43$, $p<0.001$; $M=635.8$ ms), root-letter ($\chi^2(1)=10.68$, $p<0.005$; $M=647.2$ ms), and two-letter conditions ($\chi^2(1)=4.26$, $p<0.05$; $M=654.8$ ms) than in the control condition ($M=666.3$ ms). Although subjects likewise responded significantly faster to non-Semitic targets in the repetition condition ($\chi^2(1)=48.57$, $p<0.001$; $M=645.4$ ms) than in the control condition ($M=696.4$ ms), RTs in the root-letter ($\chi^2(1)=0.04$, n.s.; $M=691.0$ ms) and two-letter conditions ($\chi^2(1)=1.02$, n.s.; $M=695.1$ ms) did not differ significantly from the control condition. That the effect of root-letter exposure was significant only for Semitic targets suggests that this effect is morphological in nature, rather than being due to form overlap, and thus supports an abstract level of morphological representation in the Maltese lexicon. Moreover, since triconsonantal strings constitute illegal non-words to which Maltese readers are never exposed, these results suggest that speakers have abstracted out root-morphemes from Semitic words and stored them lexically across reading experience.