Supraliminal and subliminal root and binyan priming in Maltese

While Semitic root-and-pattern morphology has received an enormous amount of attention in the theoretical literature (e.g., McCarthy 1981, Bat-El 2003, Ussishkin 2005), quantitative research into its typologically unusual word formation processes has been relatively limited. Moreover, most studies of the role of the consonantal root in lexical access in Hebrew (e.g., Frost et al. 2000) and Arabic (e.g., Boudelaa and Marslen-Wilson 2001) are confounded because Hebrew and Arabic orthographies mainly represent consonants. We address potential orthographic confounds in two ways: (i) by investigating the Semitic language Maltese, whose orthography does not favor consonants over vowels, and (ii) by solely using the auditory modality.

Following recent work on Maltese by Twist (2006) and Ussishkin and Twist (2009), we report here on a series of lexical decision experiments designed to investigate whether a prime in Maltese that shares morphology with a target facilitates lexical access for that target in the auditory modality. The stimuli consisted of sets of prime-target pairs drawn from the Semitic stratum of Maltese vocabulary and manipulated across three priming conditions: a control condition, in which the prime and its target share no consonantal root or binyan; an identity condition, in which the prime and its target are identical; and a morphologically-related condition, in which the prime and the target share a consonantal root or a verbal binyan. In Experiments 1 and 2, primes and targets were presented to subjects supraliminally (with both prime and target audible). In Experiments 3 and 4, primes were presented subliminally (i.e., subjects were not conscious of the prime), followed by audible targets (cf. Kouider and Dupoux (2005) and Dupoux et al. (2008) for this innovative methodology). Creating a subliminal prime involves a durational compression of the prime to 35% of its original length, and masking it in sequenced reversed words that are also compressed. As reported in Kouider and Dupoux (2005), this results in subjects not consciously perceiving the prime.

Our results support a model of lexical access in which the consonantal root plays a role. In Experiment 1, with supraliminal root primes, we found a strong effect of identity priming, as well an effect of priming for the related condition, in which primes and targets share roots ($F1(2,134)=25.86$, $p<.001$, $F2(2,70)=18.5$, $p<.001$). Experiment 2, however, reveals no such facilitation when primes and targets share a binyan. Experiment 3, with subliminal primes, revealed not only an effect of identity priming, but again an effect of root priming ($F1(2,130=3.72$, $p<.02$, $F2(2,70)=3.05$, $p<.05$). Experiment 4 shows no effect of binyan priming with subliminal primes. To our knowledge, Experiments 1 and 3 represent the first documented case of subliminal, auditory morphological form priming. These results also show that consonantal roots are a part of the organization of the Maltese lexicon, since in Experiments 1 and 3, primes that share a root with their targets facilitate lexical access.

Word count: 470

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