

## Does meaning matter? Effects of Arabic morphological opacity on lexical processing in visual word recognition

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The topic of processing Arabic morphology is receiving increased interest from researchers working in psycholinguistics and second language acquisition due to the pervasive role of morphology as an organizing factor of lexical representation and processing in Semitic languages. Boudelaa and Marslen-Wilson's (2000, 2004, 2005, and 2011) studies on Arabic lexical processing in native speakers of Arabic, among others, reveal that Arabic has a morpheme-based processing system. Many Arabic words share the same root regardless of their semantic relationship (e.g., semantically unrelated words qinaaf (قناع)—*mask* and qanaafat (قناعاة)—*satisfaction* share the root q-n-ʕ; semantically related words saʕiid (سعيد)—*happy* and saʕaadat (سعادة)—*happiness* share the root s-ʕ-d). Arabic morphology not only plays an essential role in processing phonology, but it also influences orthographic processing.

Studies on second language acquisition (i.e., mainly Indo-European languages) that have explored the role of derivational morphology in visual word recognition have suggested that morpheme-sized representations are automatically triggered at a very early stage of visual word recognition (Rastle & Davis, 2008). One of the main findings of stem priming research is that morphological priming also takes place when targets are preceded by semantically unrelated primes (e.g., apart – apartment). Researchers such as Taft and Foster (1975) claim that input words are decomposed into morphemes without any reference to full-form lexical information or semantic transparency. Other experiments, however, show a clear advantage for priming of morphologically transparent words over unrelated ones (Morris, Franck, Grainger, & Holcomb, 2007).

Due to the limited research examining morphological processing of Arabic as a second language, and in light of research on native speakers (NSs) and non-native speakers (NNSs) of Arabic, the focus of this paper is on root-root priming with Arabic non-native speakers (NNSs). It explores whether NNSs show root priming effects of prime-target pairs regardless of semantic transparency. A masked priming study with a stimulus onset asynchrony of 80ms comparing the morphological processing in NSs and NNSs was conducted. The design included five conditions in which the prime-target relationships were controlled: +root/+semantic, +root/–semantic, –root/+semantic, orthographic similarity, and the identity condition. Each item under the five conditions was matched with an unrelated prime, which was balanced with the target and related prime for word length and frequency.

The data were collected from forty-three NSs and thirty-one NNSs (both groups were seeking undergraduate and graduate degrees in Saudi Arabia). Advanced NNSs were recruited on the basis of their language background and proficiency level (above 70% accuracy on a cloze test). For 240 critical trials (120 words and 120 non-words), the participants were asked to respond quickly and accurately to the words that appeared on the screen. They responded by pressing the left (for nonword) or right (for word) control (Ctrl) buttons on a PC running the Windows operating system.

On the one hand, NSs' results exhibited significant priming effects only for the identity condition. While the +root/–semantic and orthographic conditions showed weak inhibition effects, the +root/+semantic and –root/+semantic showed minimal facilitation. The NSs' results were different from what has been reported in the studies of Boudelaa and Marslen-Wilson,

possibly due to a number of different factors (e.g., choice of words, word frequency, participants' background, etc.). On the other hand, NNSs' results yielded statistically significant priming effects for both +root/-semantic and identity conditions. Weak facilitation was shown for the +root/+semantic, -root/+semantic, and orthographic conditions. The results suggest that NNSs' lexical access relies more on morphology than on semantics to process Arabic words. It supports a line of research on L2 processing and Arabic processing in which input words are decomposed into morphemes (e.g., root or stem) without reference to semantic transparency.

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