

Form vs. Meaning in Visual Word Recognition: An MEG study using Masked Priming

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Masked Priming [1] has been used in behavioral studies to dissociate the effect of form (orthography and/or morphology) and meaning (lexical relatedness) in visual word recognition. The goal of this study is to establish the neural correlates of this dissociation using magnetoencephalography (MEG). In two lexical decision experiments, we presented masked primes (prime duration 34ms, presented by DMDX) to 12 subjects and measured RT on the target words. Experiment 1 tested priming with unrelated, identical, vs. semantically related primes (Prime: tomato, sofa, vs. couch. Target: SOFA; 40 items per condition). All primes were presented in lower case, and all targets in upper case. We replicated the behavioral results reported in [2]: priming by identical primes; no priming by unrelated or semantically related primes. Preliminary analysis of the MEG measurements show a shorter latency at the M170 for identity priming, with no difference between unrelated or semantically related primes. Experiment 2 tested priming with morphologically vs. orthographically related primes. Based on Experiment 1, we hypothesized that morphological decomposition applies blindly to all *potentially* complex words (Primes: trifle, brother, brothel. Target: BROTH; 40 items per condition). Any target-prime pair differing only by a letter string that can be a morpheme in English was considered morphologically related (e.g. brother and BROTH are related on this definition, see also [3]). The behavioral results showed priming in both morphologically and orthographically related conditions, replicating results in [3]. Based Experiment 1 we expect to find also a neural correlate of form priming in the latency of the M170 component. Our experimental results show that the M170 reflects a representation of word form that is responsible for masked priming effects and is activated before the lexical meaning is accessed.

- [1] Forster, K.I., & Davis, C. (1984). Repetition priming and frequency attenuation in lexical access. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 10, 680-698
- [2] Rastle, K., Davis, M.H., Marslen-Wilson, W.D., & Tyler, L.K. (2000). Morphological and semantic effects in visual word recognition: A time-course study. *Language and Cognitive Processes*, 15 (4/5), 507-537.
- [3] Rastle, K and Davis, M. H. (2003). Reading Morphologically-Complex Words: Some Thoughts from Masked Priming. In: Kinoshita, S. & Lupker, S.J. (eds.), *Masked priming: State of the art*. Psychology Press.