Department of Experimental Psychology, Universiteit Gent
October 18, 2012

GET IT IN A BIT!
EARLY STEPS IN THE VISUAL IDENTIFICATION OF COMPLEX WORDS

Davide Crepaldi

MoMo Lab
Department of Psychology, University of Milano-Bicocca
20126, Milan, Italy
davide.crepaldi1@unimib.it
www.davidecrepaldi.net

Recent models of the visual identification of complex words differ substantially as to how they structure their early processing stages. The critical divide seems to be whether semantics kicks in early on (e.g., Grainger and Ziegler, 2011), or rather later in processing, after morphological analysis has been only orthographically grounded for a while (e.g., Taft, 2006). Classic masked priming data do not provide a clear–cut answer in this respect as scholars debate hotly as to whether, e.g., *dealer–DEAL* yields equivalent masked priming to *mother–MOTH* (e.g., Diependaele et al., 2011; Davis and Rastle, 2010). We thus resorted to a different technique, i.e., incremental masked priming (IMP), to assess whether (and, if so, when) transparent and opaque effects diverge. IMP has the big advantage of getting rid of unrelated primes — thus excluding possible inhibitory effects brought about by the baseline — and of allowing to test different SOAs with the same participants on the same items — thus allowing to assess the effect of prime presentation time with a finer temporal resolution. Results indicated a cross–over interaction between SOA and morphological relationship, so that morpho–orthographic effects dominated at short SOAs, but morpho–semantic effects did so at SOAs closer to the awareness threshold.

Another aspect that has been poorly studied is how the classic morpho–orthographic pattern responds to task manipulations. Duñabeitia et al. (2011) have shown that not only morpho–orthographic, but even morpho–semantic effects disappear when participants set out for a purely orthographic taks (i.e., same–different task). This shows that morpho–orthographic segmentation isn't an obligatory process, but is silent as to whether it serves *necessarily* lexical identification, because the same–different task doesn't require lexical identification at all. We thus set up a new paradigm where primes were still presented outside participants' awareness, but the task required people to make contact with lexical representations. Eye tracking data showed clear morpho–semantic effects, but neither morpho–orthographic nor form effects, proving that semantically–blind morphological segmentation isn't necessary for lexical access (Marelli et al., 2012).

Finally, current models remain agnostic as to how morpheme position is coded in the system, so as to make the reader able to distinguish between *hangover* and *overhang*, and to appreciate that *preheat* is a word, but *heatpre* isn't. By exploiting both masked priming and morpheme inhibition effects in nonword rejection times, we showed that suffix representations are position–locked, i.e., suffixes are only identified as such after an existing stem (Crepaldi et al., 2010), but free stem representations are not, so that letter strings like *moonhoney* drive significant activation in the lexical representation for *honeymoon* (Crepaldi et al., 2012).

Overall, these data show that none of the existing model is able to account for the available evidence, and that theories should be modified so that (i) morpho–orthography and morpho–semantics interact in a complex way to determine how each specific word is processed; (ii) processing is modulated by task demands; (iii) morpheme representations are sensitive to the positional constraints revealed by everyday–life input.

References

Crepaldi, D., Rastle, K., and Davis, C. (2010). Morphemes in their place: Evidence for position-specific identification of suffixes. *Memory and Cognition*, 38(3):312–321.

Crepaldi, D., Rastle, K., Davis, C. J., and Lupker, S. J. (2012). Seeing stems everywhere: Position-independent identification of stem morphemes. *Journal of Experimental Psychology: Human Perception and Performance*, in press.

Davis, M. and Rastle, K. (2010). Form and meaning in early morphological processing: Comment on feldman, o'connor, and moscoso del prado martín (2009). *Psychonomic Bulletin and Review*, 17(5):749–755.

Diependaele, K., Duabeitia, J., Morris, J., and Keuleers, E. (2011). Fast morphological effects in first and second language word recognition. *Journal of Memory and Language*, 64(4):344–358.

Duñabeitia, J., Kinoshita, S., Carreiras, M., and Norris, D. (2011). Is morpho-orthographic decomposition purely orthographic? evidence from masked priming in the same-different task. *Language and Cognitive Processes*, 26(4-6):509–529.

Grainger, J. and Ziegler, J. (2011). A dual-route approach to orthographic processing. *Frontiers in Language Sciences*, 2.

Marelli, M., Amenta, S., Morone, E. A., and Crepaldi, D. (2012). Meaning is in the beholder's eye: morpho–semantic effects in masked priming. *Psychonomic Bulletin and Review*, in press.

Taft, Marcus & Ardasinski, S. (2006). Obligatory decomposition in reading prefixed words. *The Mental Lexicon*, 1:183–199.