Morphological Processing of Nouns and Verbs: Lexical Priming in Reading

Davide Crepaldi©, Lisa Saskia Arduino®, Valentina Tobia® and Claudio Luzzatti®
© Department of Psychology, University of Milano-Bicocca, Milano, Italy
® Institute of Psychology, University of Urbino, Italy and ISTC-CNR, Roma, Italy

INTRODUCTION
Since the 80s, many studies on aphasic patients approached the issue of the noun/verb dichotomy representation in the human linguistic system (Miceli, Silveri, Villa & Caramazza, 1984).

This dichotomy has been suggested to be represented in the lexicon either:
• at a peripheral, modality-specific stage, that is, the phonological and orthographic lexicons (e.g., Rapp & Caramazza, 2002; see the lexeme level in Levelt’s model; Levelt et al., 1999) or
• at a more central, modality-independent, lexical-syntactic level (e.g., Berndt et al., 1997 and Crepaldi et al., 2006; see the lemma level in Levelt’s model).

An experimental has not been reached by considering only the studies on aphasic patients; some converging evidence from other sources of information is requested.

For example, the orthographic priming effects can provide a clear understanding of what happens in the input orthographic lexicon with a very high temporal resolution.

We can then use these effects to test whether nouns and verbs are differently represented at the very first levels of lexical processing (lexeme level).

General questions
1. Does the orthographic priming effect have the same characteristics irrespective of the grammatical class of the items used?

   More specifically:
   • is there a cross-category priming effect?
   • does this possible effect present the well-known time course of the priming effects observed when the grammatical class is not taken into consideration? (see for example Feldman, 2000)

   2. Is the effect symmetrical when a noun primes a verb and when a verb primes a noun?

Prediction
If nouns and verbs are differently represented in the orthographic input lexicon as suggested by some studies on aphasic patients (see above), then we should expect that the grammatical class of the items do influence the observed priming effects, especially at short SOAs.

MATERIALS AND METHODS

Subjects
62 Italian undergraduate students (42 females and 20 males; mean age: 23.4).

Materials
2 experimental lists made up of 45 pairs of Ns and Vs:
• A morphological set in which the pairs are morphologically and semantically related (e.g. bacio-baciare,ksi-ksi; pairwise matching for imageability and length, while Vs are listwise slightly more frequent than Ns; Crepaldi et al., 2006).
• A semantic set in which the pairs are only semantically related (e.g. amore-baciare,love-to kiss; pairwise matching for word frequency and length).

2 control lists made up of 45 Ns and 45 Vs:
• a control list of unrelated words matched pairwise for word frequency and length with the semantic set.
• a control list of unrelated words matched pairwise for word frequency and length with the morphological set.

Task
Reading task

Experimental Design
A 2x2 mixed design with the following variables:
• prime type (PT): morphological vs semantically related; between factor.
• stimulus onset asynchrony (SOA): 100 ms vs 300 ms; between factor.
• grammatical class (GC): Ns priming Vs vs Vs priming Ns, within factor.

RESULTS

Methodological advice
The percentage of correct answers was at ceiling (the mean was 98% both in the items analysis and in the subjects analysis) and thus it was not analyzed further: then, the reported results refer only to the RTs.

REFERENCE

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Feldman, L. (2000). Non-semantic priming a V or, vice versa, a V is priming a N. Priming a V or, vice versa, a V is priming a N. Summing up, the results seem to indicate that:

the grammatical class is represented in some way in the orthographic input lexicon: if it was not, semantic priming would be expected as it occurs when nouns are used as stimuli.

and Vs entertain relationships ONLY if they are morphologically related and not when they are merely semantically related.

When the SOA is 100 ms, No semantic priming with neither SOAs.

No interaction between REL and GC in neither condition.

DISCUSSION & CONCLUSION
The characteristics of the cross-category orthographic priming are very different from those usually described by the studies which do not take into account the grammatical class (e.g., Fielden, 2000). In particular:

• The priming effect is present only with morphologically related stimuli but not with semantically related stimuli.

• The SOA does not interact with the priming effect, at least when considering this small, though representative, sample of values (100 ms and 300 ms).

• The priming effect has the same characteristics irrespective of the fact that a N is priming a V or, vice versa, a V is priming a N.

In conclusion, the results seem to indicate that:

the grammatical class is represented in some way in the orthographic input lexicon: if it was not, semantic priming would be expected as it occurs when nouns are used as stimuli.

and Vs entertain relationships ONLY if they are morphologically related and not when they are merely semantically related.

Nonetheless, since the grammatical class does not interact with the priming effect, Ns and Vs are probably symmetrically represented, without any relevant qualitative difference.

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