

LEXICAL PREDICTION DOES NOT INTERACT WITH MORPHOPHONOLOGICAL PREDICTION DURING EARLY STAGES OF SENTENCE PROCESSING

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During sentence comprehension we make predictions not only about upcoming words but also about their morphophonology based on both semantic and grammatical knowledge (Freuenberger & Roehm, 2016). But what is the timing of these processes and what can this tell us about information prediction prioritization? Previous research (see Martin-Loeches et al., 2006, for a review) has showed mixed evidence supporting either a *syntax-first model* (Friederici, 2002, 2011) that considers each source of information independently at initial stages and integrates it at later ones, or an *interactive model* (Hagoort, 2003) that considers all types of information right from early points of processing. Most studies have manipulated semantic violations, and only a few manipulated cloze-probabilities of nouns (e.g., Gunter et al., 2000; Wicha et al., 2004). We explore for the first time whether verb cloze-probability interacts with object-clitic agreement, and if so, at what stage(s) these processes interact.

ERPs of 23 Spanish native speakers were recorded during a RSVP reading for comprehension task of sentences (n=120) with (a) semantically high- vs. low-cloze predictable (congruent) verbs and (b) gender grammatical vs. ungrammatical object-clitic morphemes; e.g., *El conductor frenó muy bruscamente el tren para intentar pararlo/*pararla vs. aparcarlo/*aparcarla en el andén*, “The driver stopped very abruptly the train_{SG-MASC} to try to stop it_{CL-SG-MASC/*FEM} vs. park it_{CL-SG-MASC/*FEM} at the platform”). If the information sources of semantic and morphophonological prediction are first used in an independent way, we expected additive effects at early stages of processing and an interaction at later ones. Alternatively, if both sources of information are considered simultaneously, we expected interaction effects at both early and late stages (e.g., larger computational cost of morphological agreement for low than high-cloze verbs).

The results favoured the first hypothesis. At early stages, between 350-500 ms (N400), there was a main effect of grammaticality (larger negativity for ungrammatical than grammatical sentences) at left (p=.019) and midline sites (p=.015) and a marginally significant semantic predictability N400 effect at left-parietal (p=.056) and mid-parietal (p=.093) regions (larger negativity for low than high-cloze verbs), but no interaction. At later stages, between 600-800 ms (early P600), we found a grammaticality by predictability interaction in the frontal region, led by a larger positivity for the grammatical-low-cloze condition than for the other three conditions, resulting in a semantic predictability effect only in grammatical sentences (p=.020; larger positivity for low- than high-cloze verbs, *aparcarlo vs. pararlo*). This suggests that semantic integration and interpretation efforts were only made for grammatical sentences.

Taken together, our results suggest that, at early processing stages, lexical/semantic prediction does not interact with morphophonological prediction, so that the two processes operate independently (in contrast to, i.a., Wicha et al., 2004). Morphophonological and semantic processing only interact at later stages where sentence integration, interpretation and repair processes take place, supporting the syntax-first model (Friederici 2002, 2011).