SIMILARITY-BASED INTERFERENCE DURING COMPREHENSION OF NOUN PHRASES: EVIDENCE FROM ERPS

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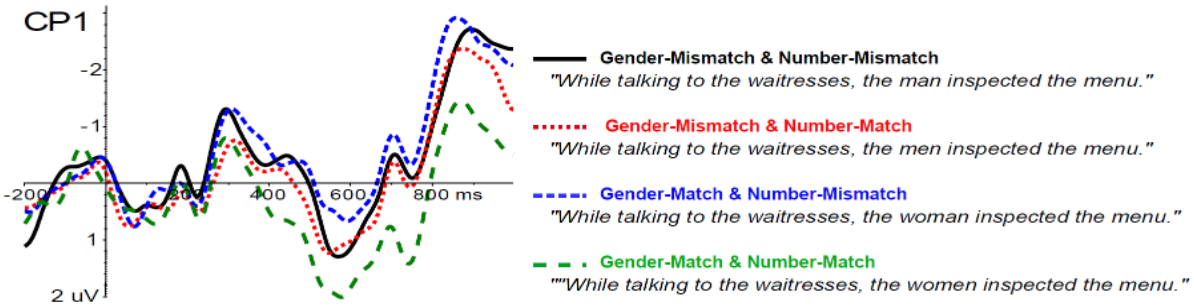
Current accounts of sentence comprehension invoke the notion of retrieval interference as a primary determinant of processing difficulty [1-2]. Specifically, similarity between constituents (e.g., NP feature-overlap) has been argued to interfere when people resolve subject-verb or anaphoric dependencies [3-7]. We ask whether similarity-based interference effects arise as a function of multiple NPs in the discourse that overlap in gender and/or number. We take a novel approach by examining interference effects at the second NP rather than downstream after "maintaining" multiple NPs [6-8], using ERPs to establish quantitative and qualitative processing consequences. We used the empty category PRO to introduce two NPs, only the second NP could be PRO controller (e.g., "While [PRO] talking to the waitresses, the man/men/woman/women"). If feature overlap affects processing of the second NP, most interference should occur under gender- and number-matching NPs. Because this interference crosses the subject-object distinction, we predicted that interference would elicit a P600 effect, the effect most reliably associated with syntactic processing difficulties [9].

Methods: During EEG recording, 24 participants read 160 grammatical sentences (40 per condition) in a 2(gender: match, mismatch) x 2(number: match, mismatch) factorial design where the first clause introduced the object-NP and had PRO as subject, and the matrix clause introduced the controller of PRO. Subject and object NPs could overlap in gender and/or number. We fully counterbalanced 160 male/female singular/plural gender-definitional nouns as object NPs, and as critical NP always 'woman/man/girl/boy' (or plural form). Sentences were mixed with 156 fillers and presented word by word (300 ms duration, 200 ms blank), followed by intermittent comprehension questions (85% response accuracy).

Results: Across all electrodes, a significant gender by number interaction was observed (500-800 ms window [9]; $F(1,23)=6.02$, $p<.05$), due to a robust P600 effect of number-mismatch in the gender-match conditions ($M=-1.18$, $F(1,23)=8.04$, $p=.01$), that did not occur in the gender-mismatch conditions ($M=-.17$, $F(1,23)=.18$, ns). No distributional effects were observed.

Conclusions: The P600 effect for double-match NPs suggests that interference is driven by similarity contingent upon matching gender and number. Our results testify to the strength of gender-cues during incremental processing, consistent with memory-based accounts of discourse comprehension [2-7]. When features maximally overlap, the subject NP may be momentarily considered as an anaphor for the more distinctive (i.e., first-mentioned and semantically richer) object NP. Alternatively, the P600 may reflect increased discourse complexity stemming from similar NPs [10]. Our results imply a central role for interference during comprehension, even of simple grammatical sentences.



References

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