

STRUCTURAL AND SEMANTIC CUES IMPACT THE PROCESSING OF THE WEAK CROSSOVER CONSTRUCTION AT DIFFERENT STAGES: EVIDENCE FROM SELF-PACED READING

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Introduction This study examines when structural and semantic cues are accessed during pronoun resolution in the weak crossover (WCO) construction in English. In a WCO sentence, the *wh*-phrase (e.g., *which man*) moves across a non-c-commanding co-indexed pronoun, like *his* in (1a). In theoretical linguistics, it is often assumed that co-reference between *which man* and *his* in (1a) is not allowed due to structural constraints like the Bound Anaphor Condition (Reinhart'83). However, a prior study examining the real-time processing of pronouns in the WCO construction (Kush et al.'17) presented evidence that the semantic information/cue (gender) of the *wh*-phrase is quickly accessed, suggesting that the WCO constraint is weak. This study builds on prior work but adopts a different design that fully crosses the gender congruency of the structurally licit *and* illicit referents (see (1a-d)) to identify when structural and semantic cues modulate real-time processing.

Examples of the target stimuli (slashes mark different regions in self-paced reading):

(1a) TARGET MATCH/DISTRACTOR MATCH

Peter/ wondered/ *which man*/ in/ the office/ his/ supervisor/ had/ promoted/ recently.

(1b) TARGET MATCH/DISTRACTOR MISMATCH

Sarah/ wondered/ *which man*/ in/ the office/ her/ supervisor/ had/ promoted/ recently.

(1c) TARGET MISMATCH/DISTRACTOR MATCH

Sarah/ wondered/ *which man*/ in/ the office/ his/ supervisor/ had/ promoted/ recently.

(1d) TARGET MISMATCH/DISTRACTOR MISMATCH

Peter/ wondered/ *which man*/ in/ the office/ her/ supervisor/ had/ promoted/ recently.

To foreshadow the conclusions, our self-paced reading study shows that during pronoun resolution, there is no 'semantic intrusion' effect from a structurally illicit *wh*-phrase (e.g., *which man*); only the gender of the structurally licit referent (e.g., *Peter/Sarah*) plays a significant role. However, at the later processing stages, the gender cue of the *wh*-phrase does seem to modulate the processing patterns. This suggests that the WCO constraint – despite being violable at the later comprehension stages – is not violated at the early processing stages. The post-reading acceptability judgment also matches the overall reading time (RT) patterns.

Methodology Participants ($N = 50$) read sentences region by region. At the end of each trial, they judged how acceptable the sentence is on a 1-7 Likert scale. The gender congruencies of the TARGET (match/mismatch) and the DISTRACTOR (match/mismatch) were fully crossed in a 2x2 factorial design. The target refers to the structurally licit co-referent (e.g., *Peter*), while the distractor refers to the structurally illicit co-referent (e.g., *which man*). Following prior work (e.g., Sturt'03; Kush et al.'17), we take the *gender mismatch effect*, characterized by reading slowdowns when a pronoun and its target/distractor have different genders, as a diagnostic of whether readers attempt to establish coreferences. Mixed-effect linear models were used (*lme4* in R) for statistical analysis.

Results The critical region is the pronoun. No effects are significant prior to the first spillover region (e.g., *supervisor*) which shows only a main effect of TARGET mismatch effect ($p < .001$). This suggests that only the gender of the structurally licit target referent (e.g., *Peter/Sarah*) is accessible at this stage, while the gender of the distractor has no effect on pronoun resolution ($p > .6$).

At the final region (e.g., *recently*), within the target match conditions, distractor mismatch (1b) causes significant reading slowdowns ($p < .05$) compared to distractor match (1a), while the gender of the distractor has no effect within the target mismatch conditions (1c-d) ($p > .2$). In the post-reading acceptability judgment, we have similarly observed a *late-stage* marginal distractor gender mismatch effect ($p = .08$) within the target match conditions in (1a-b).

In sum, the results indicate that the semantic gender of the *distractor* has a limited impact on pronoun resolution until later stages of processing in the WCO construction in English.