

The Effects of Gender Stereotyped Adjectives and Nouns During Discourse Processing

Stephanie Hammond-Thrasher & Juhani Järvikivi
University of Alberta

Occupational role names, like *florist* and *butcher*, link semantic roles to gender stereotyped representations in the real world (Hentschel et al., 2019; Gaucher et al., 2011). It is well-known that phrases that violate gender stereotype expectations disrupt language processing in real-time: sentences with pronouns (*he/she*) incongruent with these gender stereotyped antecedents are processed slower and rated as less acceptable than congruent ones (Hammond-Thrasher & Järvikivi, 2023; Oakhill et al., 2005; Banaji & Hardin, 1996). Adjectives, like *sensitive* and *dominant*, also carry gender stereotype information (Gaucher et al., 2011); however, there is yet to exist a systematic exploration of their processing.

The present research investigates gender stereotype processing at the multi-sentence (i.e., discourse) level, providing an experimental exploration of the language comprehension of both noun- and adjective- level gender stereotype clashes within three-sentence vignettes (Table 1). Participants (N = 215) read 80 short stories pairing male/female gender stereotyped adjectives and role nouns with pronouns either congruent or incongruent with the stereotypical gender of each role noun. This reading task was followed by a yes-or-no decision as to whether the last sentence (i.e., the sentence containing the pronoun) was a sensible continuation of the vignette.

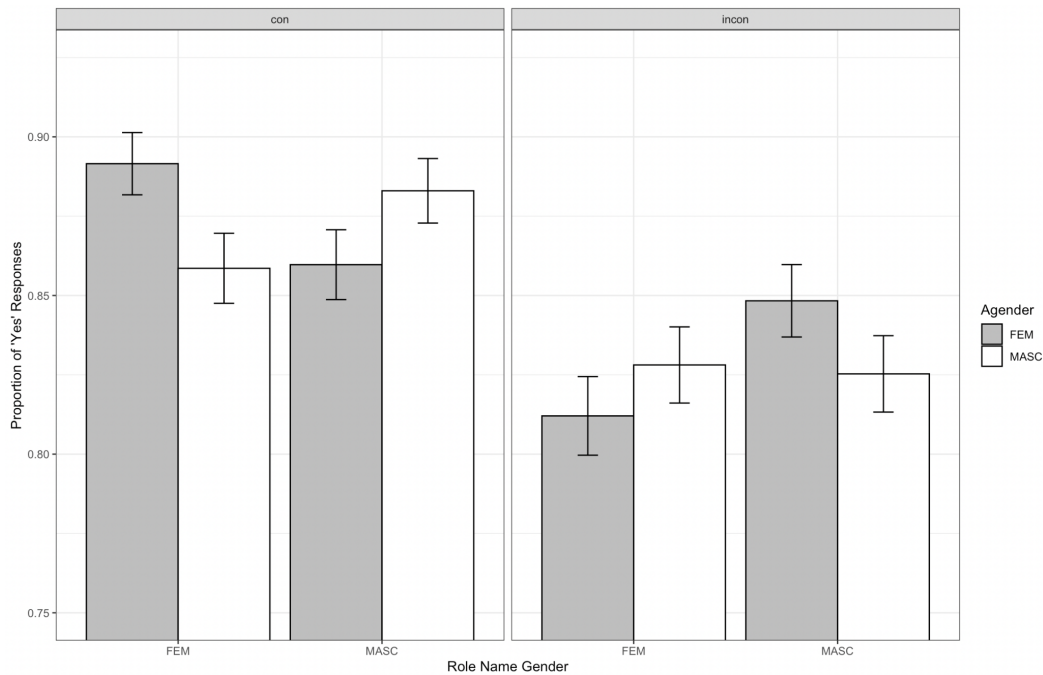
Using binomial generalized additive mixed-effects modeling (GAMMs) in R (Wood, 2017; R Core Team, 2020), the results showed several significant effects (Figure 1). Congruent items (i.e., gender alignment across the adjective, noun, and pronoun) were consistently judged to be sensible more frequently than Incongruent items ($p < 0.0001$). There were significantly more “Yes” responses for Incongruent Male items (i.e., feminine adjective, male role name, and female pronoun) compared to Incongruent Female items (i.e., masculine adjective, female role name, and male pronoun; $p < 0.002$). Finally, there was a significant three-way interaction: an adjective-noun couple where both components were Incongruent with the pronoun resulted in the lowest proportion of “Yes” responses. That is, items combining feminine adjectives with feminine role names and male pronouns were responded to with the least number of “Yes” responses; contrastively, items combining masculine adjectives with masculine role names and female pronouns were responded to with significantly more “Yes” responses compared to the former ($p < 0.001$). GAMMs for reading time data (i.e., time in milliseconds taken to read Sentence 3) supported these binomial effects.

The results from this study indicate that clashes with gender stereotypes embedded in both adjectives and nouns significantly disrupt language comprehension during discourse processing, and that the specific gender of each stereotype predicts the extent of this disruption. In line with previous research (Hammond-Thrasher & Järvikivi, 2023; Grant et al., 2019), stories describing male agents fulfilling stereotypically feminine roles were judged to be less sensible than those describing female agents fulfilling stereotypically masculine roles. This result echoes sociological findings that indicate that migration of women to masculine roles is more prominent than the migration of men to feminine roles (Haines et al., 2014). Linguistically, the incongruence of two items (i.e., both an adjective and a noun) facilitates an amplified stereotype-based representation of a protagonist within discourse that then must undergo a more significant revision when a clashing pronoun is encountered.

Table 1. Sample Three-Sentence Vignette

Sentence 1	Sentence 2	Sentence 3
You are driving down a busy highway.	You see the dominant truck driver change lanes.	You watch him turn on the wind-shield wipers.

Figure 1. Proportion of “Yes” Key Presses Across Congruence, R Gender, and A Gender



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