The effects of grammatical gender on reference processing in German: An ERP study

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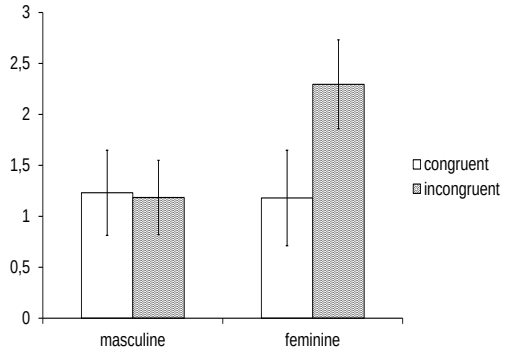
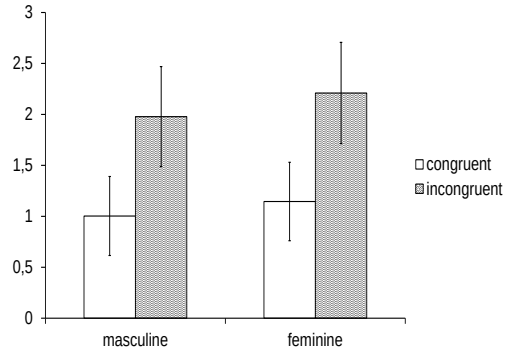
Abstract

As a linguistic category, gender is *'almost universally present in language'* (Irmen, Holt, & Weisbrod, 2010, p. 133). In German, masculine and feminine grammatical gender often map onto social categories of male and female gender. Importantly, role nouns (e.g., job titles) in the grammatically masculine form can refer to all genders, including women. Grammatically masculine forms (e.g., Studenten$_{masc.}$ [students]) are thus regularly used as the default when addressing mixed gender groups. Although intended to be gender-neutral, behavioural research suggests such usage of the grammatically masculine form favours male-specific interpretations (Gygax et al., 2008, Vervecken & Hannover, 2015), at least during decision making. The present ERP study tested how masculine grammatical gender in role nouns affects online referent processing. In line with work on non-human referents and stereotype processing (Barber & Carreiras, 2005; Irmen, Holt, & Weisbrod, 2010; Osterhout, Bersick, & McLaughlin, 1997) incongruencies between grammatical and referent gender were expected to result in a N400-P600 complex.

Twenty native speakers of German read sentences in which role nouns described mixed-gender groups. To specifically focus on grammatical gender, all chosen role nouns were neutral regarding gender stereotypicality (Misersky et al., 2014). The beginning of each sentence introduced a group of people via a role noun, which was either grammatically masculine (e.g., Studenten$_{masc.}$) or feminine (e.g., Studentinnen$_{fem.}$). The sentence continued specifing the group as consisting in part of *men* [Männer$_{masc.}$] or *women* [Frauen$_{fem.}$]). This resulted in a match-mismatch setup with continuations being either congruent (masculine–*men*; feminine–*women*) or incongruent (masculine–*women*; feminine–*men*) to the grammatical gender of the role noun. ERPs were time-locked to the continuations to assess how these were integrated with the role nouns.



(a) *Mean amplitudes in the 300–500 ms time window as a factor of Grammatical Gender (masculine vs. feminine) and Continuation (men vs. women) ± 1 SEM.*



(b) *Mean amplitudes in the 500–800 ms time window as a factor of Grammatical Gender (masculine vs. feminine) and Continuation (men vs. women) ± 1 SEM.*

No N400 was observed between 300 and 500 msec, contrary to predictions (Figure a); however, there was a later P600 effect between 500 and 800 msec (Figure b). Following masculine role nouns, all continuations were processed similarly (p = .891), suggesting the incongruency to women continuations is initially not interpreted as such. Following feminine role nouns, however, incongruent

continuations elicited more positive responses than congruent ones (p = .045). This unexpected result suggests participants may have evaluated continuations following feminine role nouns with particular caution, possibly due to the specificity of the feminine grammatical gender for female referents only (Siyanova-Chanturia, Pesciarelli, & Cacciari, 2012). Later on, following masculine and feminine role nouns, incongruent continuations resulted in more positive responses than congruent ones (p = .039), suggesting processing difficulties.

These results are consistent with the two-stage model of Garrod and Terras (2000): the incongruency between masculine role nouns and women continuations first goes unnoticed, evidenced here by the absence of the N400. Later on, however, the incongruency leads to processing difficulties as indicated by the P600. The data suggest grammatical gender is an important cue to how we process information about human referents . Specifically, the observed P600 points to a male-specific — not a gender-neutral— interpretation of grammatically masculine forms. This has important implications for the discussion and implementation of gender-fair language.

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