Measuring the male bias of generically-used masculine pronouns using event-related potentials

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The connection between grammatical gender in language and human gender is complex and often indirect. The Dutch third person pronoun *hij* 'he' does not just function as a gendered personal pronoun, but it can also be used for generic reference. We tested whether the generic use of this pronoun leads to a male bias during online language processing using an event-related potential (ERP) experiment. Participants (n = 52, 19 male) read sentences about a person, either with the generically-used masculine (e.g., 'Someone who thinks **he** is clever, like …') or with a neutral control sentence setup (e.g., 'Someone who is known as clever, like …'). The sentence then continued with reference to a female person (e.g., *mevrouw Smit* 'Mrs Smit') or a male person (e.g., *meneer Smit* 'Mr Smit'). We expect that if a generically-used masculine *hij* 'he' indeed leads to a male bias, we should find event-related potential (ERP) components reflecting surprisal for the female, but not the male sentence continuation. We also expect that there may be differences in how male and female participants respond to the generically-used masculine form, since male participants, but not female participants, will be used to being referred to with both the non-generically-used and the generically-used masculine.

Our preliminary results show effects related to our stimuli for two common ERP components. First, we find a difference in how female and male participants process the sentence continuation (*meneer* 'mister' or *mevrouw* 'miss(es)') reflected in the P300 time window. The P300 component is not limited to language, but rather found in a wide range of paradigms where attention is modulated (Polich, 2007). Stimuli that are highly relevant to a task evoke a stronger P300. Notably, our female participants show a stronger P300 in response to sentences continued with *mevrouw* 'miss(es)' than *meneer* 'mister' (see Figure 1). There is no such difference for male participants. Second, we find a comparable interaction effect between participant gender and sentence continuation in the Nref window. The Nref constitutes a left-frontal sustained negative shift starting from 250 to 1000 ms following a stimulus. This component is associated with referent resolution (Hoeks & Brouwer, 2014; Nieuwland, 2014; van Berkum et al., 1999), with a greater Nref amplitude associated with more difficulty in resolving a referent. Our female participants, but not our male participants, show a stronger Nref in response to sentences continued with *mevrouw* 'miss(es)' than *meneer* 'mister' (see Figure 2).

The ERP effects that we find are not in line with a male bias effect following a generically-used *hij* 'he'. In contrast to our expectations, we do not find a difference in ERP amplitudes dependent on whether a sentence contains *hij* 'he'. Also unexpected is the finding that male and female participants process the words *mevrouw* 'miss(es)' and *meneer* 'mister' differently regardless of how the sentence begins. However, other ERP studies employing language stimuli which also result in P300 modulations may provide clues towards its interpretation. The P300 is stronger for self-relevant stimuli, such as one's name and other autobiographical details such as hometown and school name (Gray et al., 2004). It is therefore possible that our female participants show a stronger P300 in response to the word *mevrouw* 'miss(es)', because it is self-relevant to them. The Nref which follows this may suggest that the referent for *mevrouw* is harder to resolve for female participants, but it is more likely an artifact of the earlier P300. In conclusion, while we do not find a male bias following a generically-used

masculine, we do find differences in how male and female participants process the gendered address terms *mevrouw* 'miss(es)' and *meneer* 'mister' related to self-relevance.

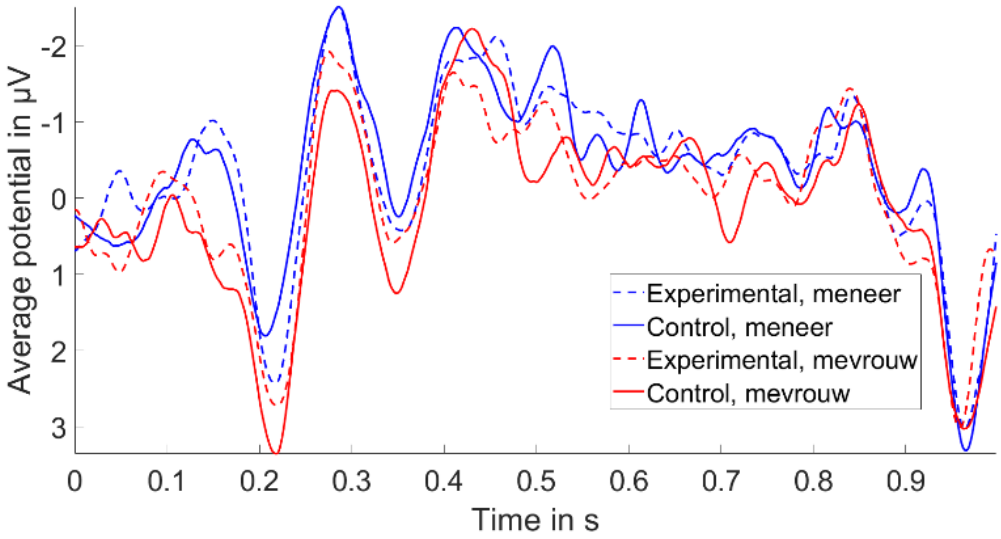

Figure 1. ERP waveform for female participants (*n* = 32).

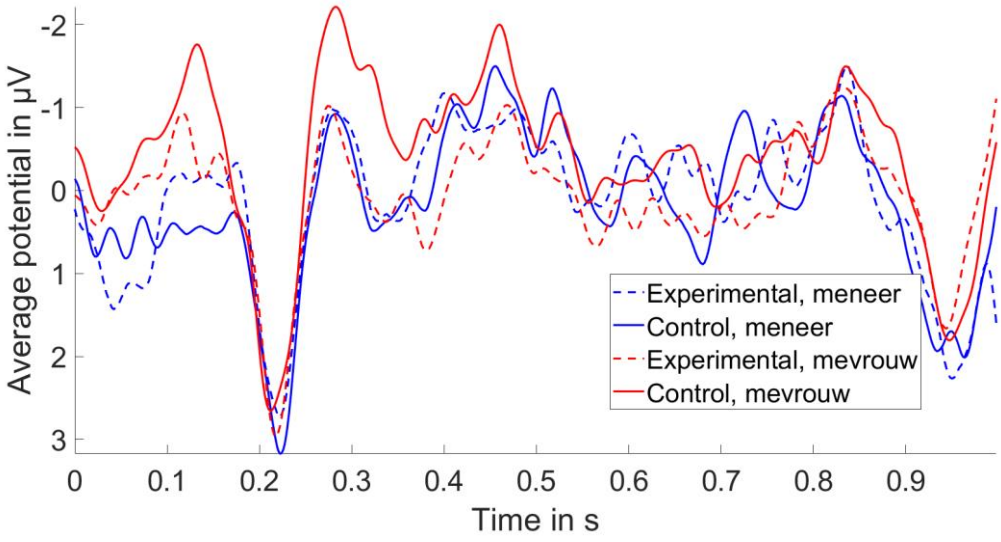

Figure 2. ERP waveform for male participants (*n* = 19).

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