The president will give her inauguration speech: Explicit belief and implicit expectations in language production and comprehension

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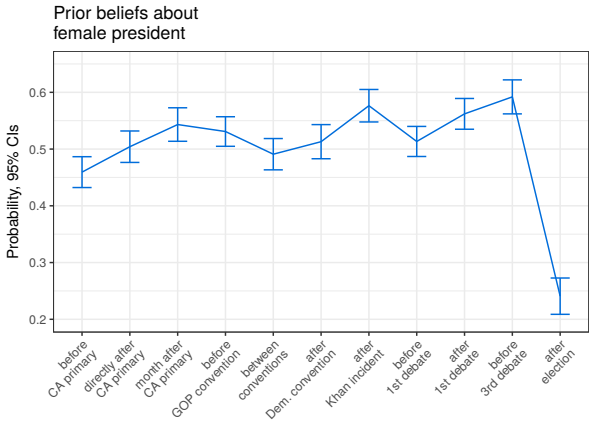
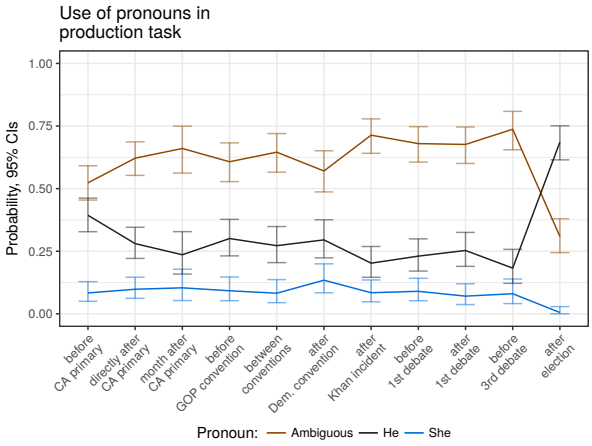
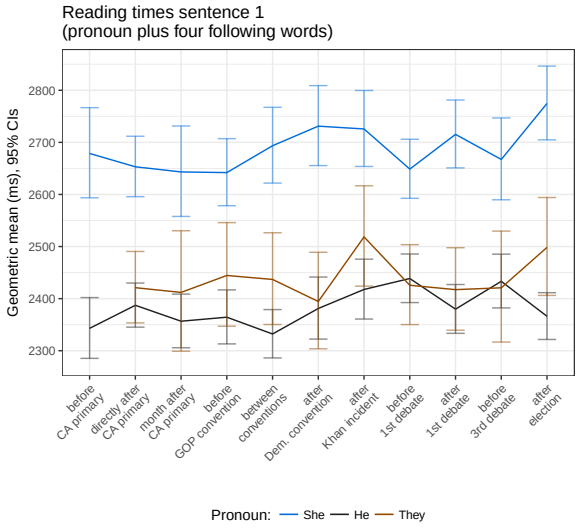
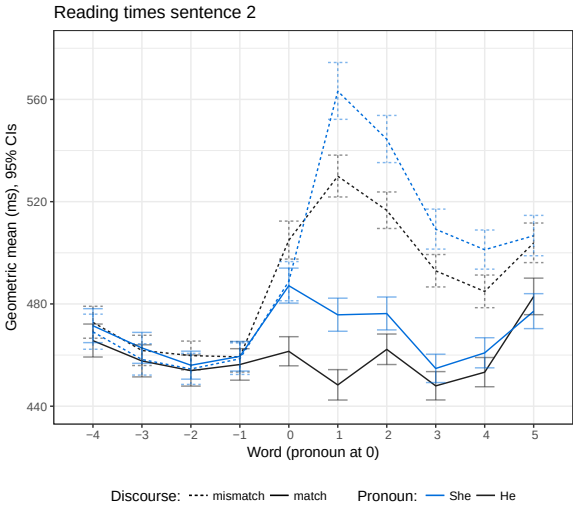
Prediction in language processing reflects a broad range of knowledge and beliefs about the world, including both typical states of affairs and contextually variable information. This breadth is exemplified in gender processing where violated gender stereotypes (e.g., referring to a surgeon with *she*) elicit surprise but comprehenders can accommodate to non-stereotypical gender within a discourse. The 2016 US presidential campaign afforded us a unique opportunity to track the evolution of gender stereotypes implicit in language processing as the prospects of the candidates rose and fell. In 11 experiments conducted from before the California Democratic primary (June 7) until after the election, we investigated whether changes in the perceived chance of a female president have an immediate impact on the production and comprehension of gendered pronouns. **Component 1** of each experiment elicited prior beliefs about the chance of a female winning the presidency by prompting participants to estimate each then-active candidate's probability of becoming president. **Component 2** measured production preferences by having each participant complete one out of twelve sentence fragments about the next president (see 1, including example completions). In **Component 3** these twelve sentences were combined into 132 pairs, and combined with a stage-setting context sentence for self-paced reading; in one condition, Sentences 2 and 3 each contained a singular *they* referring to the president, and in four conditions Sentences 2 and 3 each contained a male or female pronoun (see 2). More than 20,000 self-reported US citizens were recruited via Amazon Mechanical Turk, each participating in a single-trial experiment from exactly one of the three components. Demographic variables were also collected: age, gender, education, political alignment, geographic location, and consumption of election-related news.

Results: The estimated probability of a female president (Component 1) increased over time ($p \ll 0.001$) but dropped sharply after the election (Panel 1). In production (Component 2), among all trials where the completion included a reference to the president, the use of male pronouns decreased over time ($p < 0.01$), whereas singular *they* increased ($p < 0.01$, Panel 2); the use of female pronouns did not increase. Reading times (RT, Component 3) starting with the pronoun in Sentence 2 were considerably longer when the pronoun was female ($\approx$ 300ms summing regions 0–4, $p \ll 0.001$, Panel 3); this RT disadvantage did not change significantly over time. (In a control experiment using the same population and methods (N=1480), we benchmarked RT difference between male and female pronouns in absence of any contextual gender-bias (see ex. 3) but found no statistically significant difference.) In Sentence 3, there was a slowdown at and after the pronoun in response to a discourse mismatch (*she... he*, *he... she*, $p \ll 0.001$); this effect was delayed but bigger overall when the second pronoun was female ($p < 0.01$, Panel 4). **Conclusions:** Our results reveal striking differences in the knowledge recruited in production versus online comprehension. Pre-election, strengthening explicit expectations for a female future president were also reflected in production. However, these expectations did not manifest in increasing female pronoun use, but rather in more gender-ambiguous references. Indeed, in all pre-election experiments, male pronouns were more frequent than female pronouns despite prior beliefs consistently above 50% that the president would be female, perhaps reflecting persistent long-term gender-stereotypes and/or linguistic markedness of female pronouns. In stark contrast to production, expectations in comprehension did not seem to change, but primarily reflected long-term gender stereotype. However, our results also show comprehenders' ability to easily accommodate to discourse-local non-stereotypical gender. More generally, this work exemplifies how the tools of psycholinguistics can reveal and deepen our understanding of implicit stereotypes.









(1) The next US president will be sworn into office in January 2017. During the inauguration speech, the president will emphasize . . .
. . . his desires for the nation.
. . . his/her commitment to xyz.
. . . national security.

(2) The next US president will be sworn into office in January 2017. During the inauguration speech, the president will emphasize ***his***|***her***|***their*** determination to resolve outstanding issues. After moving into the Oval Office, the first thing ***he***|***she***|***they*** will do is hold a staff briefing.

(3) It was Sunday and the zoo was very crowded. When ***he***|***she*** saw the baby elephant, little *Jimmy*|*Annabelle* shrieked in excitement. Back home, *he*|*she* told all the neighbors about *his*|*her* adventures.