

Gender modulates moral language processing: Electrophysiological evidence

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Previous studies reported potential gender differences in moral cognition, indicating that women may follow deontological reasoning due to harm-aversion, whereas men may more often adopt utilitarian perspectives (Friesdorf et al., 2015; Armstrong et al., 2019). This may stem from stereotypical gender roles which portray men as assertive and competent in leadership roles and women as ideal for passive and caring roles (Social Role Theory; Eagly, 1987). However, most evidence comes from explicit decision-making tasks conducted in the native language (L1). It remains unclear whether such differences extend to implicit language processing and how they interact with the use of a foreign language (L2), which is known to modulate moral responses (the Foreign Language Effect; Costa et al., 2014). The present event-related potential (ERP) study investigates whether participant gender influences morally charged language processing across L1 and L2. To this end, Polish–English bilinguals (27 women, 28 men) performed a semantic decision task in response to moral (e.g., *The volunteers helped the police during the protest.*), immoral (e.g., *The manager gave bribes to get this position.*), semantically correct (e.g., *They bought some food to eat after work.*), and semantically incorrect (e.g., *This girl downloaded a brother on her phone.*) sentences presented both in L1 (Polish) and L2 (English). Findings revealed no gender differences in early processing stages, as indexed by the N400 response. Interestingly, gender-related differences emerged in the Late Positive Complex (LPC) time frame, indicating divergence at later stages of meaning integration. In both languages, women exhibited larger LPC amplitudes for semantically incorrect sentences relative to all the other conditions, indicating increased cognitive effort invested in integrating semantic violations. In contrast, men showed a different pattern, with both semantically incorrect and immoral sentences eliciting larger LPC responses compared to semantically correct and moral sentences. This suggests comparable integration demands across these two conditions and indicates that men experienced increased difficulty integrating morally incongruent content. These findings challenge the assumption that women are uniformly more sensitive to moral violations than men (e.g., Fumagalli et al., 2010; Arutyunova et al., 2016; Armstrong et al., 2019). One possible explanation is that the predominantly justice-oriented nature of the stimuli may have increased their salience for male participants (Harenski et al., 2008). Altogether, the results point to gender-related differences emerging at later stages of processing and highlight the LPC component as a sensitive marker of such variation. Future research specifically designed to investigate gender effects is needed to confirm and extend these findings.

References:

- Armstrong, J., Friesdorf, R., & Conway, P. (2019). Clarifying gender differences in moral dilemma judgments: The complementary roles of harm aversion and action aversion. *Social Psychological and Personality Science*, 10(3), 353–363.
- Arutyunova, K. R., Alexandrov, Y. I., & Hauser, M. D. (2016). Sociocultural influences on moral judgments: East–west, male–female, and young–old. *Frontiers in Psychology*, 7.
- Costa, A., Foucart, A., Hayakawa, S., Aparici, M., Apesteguia, J., Heafner, J., & Keysar, B. (2014). Your morals depend on language. *PLoS ONE*, 9(4), e94842.
- Eagly, A. H. (1987). Reporting sex differences. *American Psychologist*, 42(7), 756–757.
- Friesdorf, R., Conway, P., & Gawronski, B. (2015). Gender differences in responses to moral dilemmas: A process dissociation analysis. *Personality and Social Psychology Bulletin*, 41(5), 696–713.
- Fumagalli, M., Ferrucci, R., Mameli, F., Marceglia, S., Mrakic-Sposta, S., Zago, S., Lucchiari, C.,

Consonni, D., Nordio, F., Pravettoni, G., Cappa, S., & Priori, A. (2010). Gender-related differences in moral judgments. *Cognitive Processing*, *11*(3), 219–226.

Harenski, C. L., Antonenko, O., Shane, M. S., & Kiehl, K. A. (2008). Gender differences in neural mechanisms underlying moral sensitivity. *Social Cognitive and Affective Neuroscience*, 3(4), 313–321.