

NEURAL CORRELATES OF THE SENSE OF AGENCY IN FREE AND COERCED MORAL DECISION-MAKING AMONG CIVILIANS AND MILITARY PERSONNEL

Emilie A. Caspar¹, Antonin Rovai², Salvatore Lo Bue³ & Axel Cleeremans⁴

¹Moral & Social Brain Lab, Department of Experimental Psychology, Ghent University, Belgium; ²Université Libre de Bruxelles (ULB), ULB Neuroscience Institute (UNI), Laboratoire de Neuroanatomie et de Neuroimagerie translationnelles and Université Libre de Bruxelles (ULB), Hôpital Universitaire de Bruxelles (HUB), CUB Hôpital Erasme, Department of Translational Neuroimaging, Belgium; ³Department of Life Sciences, Royal Military Academy, Belgium; ⁴CO3 lab, Center for Research in Cognition and Neuroscience, Université libre de Bruxelles, Belgium

Grant 150/18

Background: The sense of agency, the feeling of being the author of one's actions and outcomes, is critical for decision-making. While prior research has explored its neural correlates, most studies have focused on neutral tasks, overlooking moral decision-making. In addition, previous studies mainly used convenience samples, ignoring that some social environments may influence how authorship in moral decision-making is processed.

Aims: This study investigated the neural correlates of sense of agency in civilians and military officer cadets, examining free and coerced choices in both agent and commander roles.

Methods: Using a functional magnetic resonance imaging paradigm where participants could either freely choose or follow orders to inflict a mild shock on a victim, we assessed sense of agency through temporal binding – a temporal distortion between voluntary and less voluntary decisions.

Results: Our findings suggested that sense of agency is reduced when following orders compared to acting freely in both roles. Several brain regions correlated with temporal binding, notably the occipital lobe, superior/middle/inferior frontal gyrus, precuneus, and lateral occipital cortex. Importantly, no differences emerged between military and civilians at corrected thresholds.

Conclusions: This suggests that daily environments have minimal influence on the neural basis of moral decision-making, enhancing the generalizability of the findings.

Keywords: Decision-making, fMRI, Military, Sense of agency, Temporal binding

Publication:

Caspar, E. A., Rovai, A., Lo Bue, S., & Cleeremans, A. (2025). Neural correlates of the sense of agency in free and coerced moral decision-making among civilians and military personnel. *Cerebral Cortex*, 35(3), bhaf049.
<https://doi.org/10.1093/cercor/bhaf049>

E-mail contact: Emilie.Caspar@Ugent.be