

Decision-Making in Economic and Moral Contexts. Evidence from Social Neuroscience

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Decision-making is configured as a very complex construct that it is influenced by different variables (Rilling & Sanfey, 2011; Fehr & Camerer 2007; Wang, Liu, & Ruhe, 2004), such as emotions and cognitive evaluation (Frith & Singer 2008; Groot et al., 2017; Stallen, Smidts, & Sanfey, 2013), that allow individuals to consider personal interests, possible losses or rewards, and the ethical and moral choices implications. Specifically, this study aimed to evaluate the decision-making on a sample of 32 participants who were asked to make choices in two different action contexts: economic and health issue, although both of them were considered including “moral question”. To this aim, a task, consisting of a modified version of the Ultimatum Game was administered to evaluate participants’ choices. Specifically, the economic context proposed to divide a sum of money provided as compensation for a work done together; while the health context proposed to support a colleague’s family who is facing health issues. Within the two conditions three types of offers were presented: neutral, advantageous or disadvantageous for the subject. In the neutral condition, an offer was proposed that provided for a fair sharing of money between the two parties, in the advantageous condition a favorable offer was proposed for the subject, and finally, in the disadvantageous condition the opposite occurred. Participants' neural activity was recorded continuously through the use of near-infrared functional spectroscopy (fNIRS). The levels of oxygenated (O₂Hb) and deoxygenated (HHb) hemoglobin were considered in the prefrontal cortex (Gabay, Radua, Kempton, & Mehta, 2014; Rogers, Hazlewood, Blevis, & Lim, 2004). Results showed the recruitment of distinct and specific neural networks within the prefrontal and frontal areas, according to the different conditions and offer types. Results will be discussed by framing the different scenarios with some psychological, motivational and social issues related to decision-making.

References

- Fehr, E., & Camerer, C. F. (2007). Social neuroeconomics: the neural circuitry of social preferences. *Trends in cognitive sciences*, 11(10), 419-427.
- Frith, C. D., & Singer, T. (2008). The role of social cognition in decision making. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 363(1511), 3875-3886.
- Gabay, A. S., Radua, J., Kempton, M. J., & Mehta, M. A. (2014). The Ultimatum Game and the brain: A meta-analysis of neuroimaging studies. *Neuroscience & Biobehavioral Reviews*, 47, 549-558.
- Groot, G., Waldron, T., Carr, T., McMullen, L., Bandura, L. A., Neufeld, S. M., & Duncan, V. (2017). Development of a program theory for shared decision-making: a realist review protocol. *Systematic reviews*, 6(1), 114.
- Rilling, J. K., & Sanfey, A. G. (2011). The neuroscience of social decision-making. *Annual review of psychology*, 62, 23-48.
- Rogers, Y., Hazlewood, W., Blevis, E., & Lim, Y. K. (2004, April). Finger talk: collaborative decision-making using talk and fingertip interaction around a tabletop display. In *CHI'04 extended abstracts on Human factors in computing systems* (pp. 1271-1274). ACM.
- Stallen, M., Smidts, A., & Sanfey, A. (2013). Peer influence: neural mechanisms underlying in-group conformity. *Frontiers in human neuroscience*, 7, 50.

- Wang, Y., Liu, D., & Ruhe, G. (2004, August). Formal description of the cognitive process of decision making. In *Cognitive Informatics, 2004. Proceedings of the Third IEEE International Conference on* (pp. 124-130). IEEE.