

## **Decision-making processes and ethical choices under the neurofilmological lenses**

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By opening a dialogue between audiovisual semiotics and neuroscience, the discipline of neurofilmology investigates the sensations, perception, and relational attuning of the audience exposed to audiovisual media (D'Aloia 2021; Eugeni, 2023). To our knowledge, no previous studies investigated the impact of simply being exposed to the video of Sophie's Choice (A. J. Pakula, 1982)—a well-known moral dilemma that is classically proposed in moral decision-making studies—on the neuro- and psycho-physiological responses of a sample of healthy adults. Thus, by combining the knowledge derived from neurofilmology and moral decision-making literature, this study explored the impact of watching the film sequence depicting Sophie's moral dilemma on the electrophysiological (EEG) and autonomic responses in healthy adults. Eighteen participants watched a videoclip derived from the Sophie's Choice movie, in which was proposed the popular Sophie's Dilemma, while EEG data (EEG frequency bands: delta, theta, alpha, and beta) and autonomic indices (electrodermal activity and cardiovascular indices) were continuously recorded. After the video, participants were asked to fill in a set of items on a 5-point Likert scale assessing the level of agreement with the decision Sophie made, the morality of the choice, the agent's awareness, the intentionality, the responsibility, and the emotional impact of the decision (Cassioli et al., 2023). Results showed heightened EEG power for all frequency bands (delta, theta, alpha, and beta) in the temporo-parietal compared to frontal brain region, as well as increased electrodermal activity while processing the video clip. The activation of the temporoparietal area indicates a strong involvement in the processes of identification and empathy. The high emotional engagement was also confirmed by the self-report data. In conclusion, the in-depth study of the video-related neurophysiological correlates allows us to understand which elements of the scene accentuate the emotional involvement of the audience, specifically when high-impact moral scenes are shown on the screen.

### References

- D'Aloia A. (2021). *Neurofilmology of the Moving Image: Gravity and Vertigo in Contemporary Cinema*. Amsterdam University Press.
- Eugeni, R. (2023). Neurofilmology: Semiotics, cognitivism, audiovisual experience. In A. Biglar (A cura di), *Open Semiotics*. Volume 3. Texts, Images, Arts (pagg. 421-434)
- Cassioli, F., Angioletti, L. & Balconi, M. (2023). Machine and human agents in moral dilemmas: automation—autonomic and EEG effect. *AI & Society*, 1-13. <https://doi.org/10.1007/s00146-023-01772-4>