

Two Modes of Third-Party Judgment: Neural Correlates of Evaluating Responsibility and Intention in Action and Omission Scenarios

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Introduction

Previous imaging studies suggest that the act of attributing responsibility spontaneously elicits evaluations of the agent's intention to produce the corresponding morally negative outcome [1]. However, to date assessments of responsibility and intention have not been directly compared within the same sets of stimuli and participants. This study investigated the neural basis of third-party judgments of responsibility and intention in response to morally relevant harmful events. Avoiding the use of language-based vignettes, moral scenarios were visually presented as animations in which geometrical shapes delivered or received painful shocks. To investigate changes in the attribution of responsibility and intention, we manipulated the causal structure leading to the shock. In particular, we compared the neural representations of causation by action vs. omission, thus isolating the so-called 'omission effect' [2].

Methods

We measured the BOLD response of 30 participants viewing short animations depicting the delivery of painful shocks between geometrical shapes. The stimuli reflected two contrasting causal structures (Action vs Omission). At the end of each animations participants were required to make a judgment about one of the shapes. A visual analogue scale was used to collect ratings of the target shape with respect to three dependent measures (Responsibility, Intention, Control). We used a mass univariate event-related approach to compare the brain activity between different judgment types, as well as to contrast viewing action vs. omission.

Results

Analyses of the behavioural data showed that participants judged responsibility and intention to be lower in omission than in action [2]. Viewing omission (vs. action) scenarios was further associated with stronger neural activation in the bilateral Precuneus, a region involved in attention and goal monitoring [3]. Importantly, being in the mind-set of evaluating responsibility (vs. intention) activated a wide social cognition and attention network (R Angular gyrus, L/R Caudate, R Precuneus, L Middle Temporal gyrus, L Superior Temporal gyrus, L Parahippocampal gyrus). In contrast, evaluations of intention (vs. responsibility) activated regions involved in motivational and emotional processing (R Hippocampus, L Anterior Cingulum, L Middle Cingulum, L Middle Occipital gyrus, R Supplementary Motor area, R Inferior Frontal Orbital gyrus, R Middle Frontal gyrus, L Pallidum).

Discussion

Our results provide evidence of the involvement of regions usually associated with social cognition, in particular with spontaneous intention computation [1], in the context of moral judgment. However, stronger activation of these regions during responsibility vs. intention judgments suggests that computing responsibility is not merely a matter of computing intentions. In contrast, we suggest that a neural network that computes the external socio-moral outcomes of actions crucially contribute to responsibility judgments. This network further includes the region that shows greater activation to omission (vs. action) scenarios. In comparison, judgements of the intention to harm rely on internally-focussed 'why' computations, occurring within a motivational and affective network.

References

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