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# Do I care for others' money as much as for my own? Disentangling self- and fairness- related neural mechanisms involved in the Ultimatum Game.

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## Abstract

Rejections of unfair offers in the Ultimatum Game (UG) are commonly assumed to reflect negative emotional reactions (spite, anger) to a direct unfair treatment (Pillutla & Murnighan, 1996) and to be mediated by the activity of the anterior insula and medial prefrontal cortex (Sanfey et al., 2003; Koenigs & Tranel, 2007). We aimed to disentangle those neural mechanisms associated with direct personal involvement (i.e., elicited by being the target of an unfair proposal) from those associated with fairness considerations, such as the wish to discourage unfair behavior or social norm violations. We carried two studies in which we measured electrodermal and neural response when participants played as responders in UG, and compared the condition in which they played for themselves (classical UG) from a condition in which they played on behalf of an unknown person (third-party). Unfair offers were equally often rejected in both versions of the game. However, rejections were associated to enhanced electrodermal activity and neural signal in the medial prefrontal cortex only when participants were the direct target of unfairness. Instead, the left anterior insula was implicated in rejections both during the classical and Third-Party UG. These results speak against an interpretation of rejection in terms of a negative reaction to a direct mistreatment, and favor instead a role of insular processes related to promoting fair behavior also towards confederates.

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