Altruism/egoism: a question of points of view

Different brain structures are at the basis of these behaviours

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Sociality, cooperation and “prosocial” behaviours are the foundation of human society (and of the extraordinary development of our brain) and yet, taken individually, people often show huge variation in terms of altruism/egoism, both among individuals and in the same individual at different moments in time. What causes these differences in behaviour? An answer may be found by observing the activity of the brain, as was done by a group of researchers from SISSA in Trieste (in collaboration with the Human-Computer Interaction Lab, HCI lab, of the University of Udine). The brain circuits that are activated suggest that each of the two behaviour types corresponds to a cognitive analysis that emphasizes different aspects of the same situation.

It depends on how we experience the situation, or rather, on how our brain decides to experience it: when in a situation of need, will we adopt an altruistic behaviour, at the cost of putting our lives
at risk, or will we behave selfishly? People make extremely variable decisions in such cases: some have a tendency to be always altruistic or always selfish, and some change their behaviour depending on the situation. What happens in a person’s mind when he/she decides to adopt one style rather than the other? This is the question that Giorgia Silani, a neuroscientist at SISSA, and colleagues addressed in a study just published in NeuroImage: “Even though prosocial behaviours are crucial to human society, and most probably helped to mould our cognitive system, we don’t always behave altruistically,” explains Silani. “We wanted to see what changes occur in our brain between one type of behaviour and the other”.

Silani and colleagues used a brain imaging technique which allows investigators to isolate the most active brain structures during a task. “In our experiments the participants were immersed in a virtual reality scenario in which they had to decide whether to help someone, and potentially put their own lives in danger, or save themselves without considering the other person” explains Silani. One innovative feature of the study is in fact the possibility of creating “ecological” experimental conditions, that is, as close as possible to a real situation.

“Traditionally, studies in this field used “games” in which participants had to allocate monetary gains, but many researchers including ourselves believe that these conditions are too artificial and tell us very little about altruism and egoism in daily life. However, obvious ethical constraints make it impossible to design realistic field experiments. Virtual reality has proved to be a good compromise that preserves the authenticity of the situation without putting anyone in danger”.

Silani and colleagues were able to see that in the brain of the tested subjects significantly different brain circuits are activated during the two types of behaviour (selfish/altruistic). In the first case the most active area was the “salience network” (anterior insula, anterior cingulate cortex) whereas the most intensely involved structures in altruistic behaviour were the prefrontal cortex and the temporo-parietal junction.

“The salience network, which serves to increase the “conspicuity” of stimuli for the cognitive system, could make the dangers of the situation more apparent to the subject, leading the individual to behave in a selfish manner. Conversely, the areas that are most active when a subject decides to behave altruistically are the ones that the scientific literature commonly associates with the ability to take another person’s point of view, which would therefore make the subject more empathic and willing to act for the benefit of others”.

“Our is the first study to measure neurophysiological data during decision-making in life-threatening situations” concludes Silani. In addition to Silani, who coordinated the study, the SISSA team also includes Marco Zanon, first author, and Giovanni Novembre, whereas HCI Lab investigators are Nicola Zangrando and Luca Chittaro.

USEFUL LINKS:
Original paper on NeuroImage: http://goo.gl/eL2eWq

IMAGE:

credits: Dimitris Papazimouris (http://bit.ly/1leltxL)

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