

Spotlight

Extraordinary Altruism and Transcending the Self

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Longstanding psychological theories posit a link between empathy and altruism. A new study of anonymous kidney donors finds these ‘extraordinary altruists’ show an increased overlap in neural responses to pain for self and others. These findings, alongside other recent studies of altruism, shed new light on the nature of selflessness.

On 6 June 2014, 21-year-old Michael Campbell was driving his normal delivery route when he witnessed a nearby house burst into flames. Hearing cries for help, Campbell rushed into the burning building and discovered a badly injured man covered in debris in the second-floor bedroom. Campbell dragged the man down the stairs and out of the house just as the second floor of the house collapsed. Both men survived and Campbell received the Carnegie Medal for his heroic actions. Extraordinary acts of selflessness like this are captivating and inspiring, and a deeper scientific understanding of what makes someone risk their life for a stranger has the potential to transform our society. For obvious reasons, investigating such behavior in the laboratory seems difficult, if not impossible. An important new study makes a significant advance towards uncovering the neural basis of exceptional altruism.

Brethel-Haurwitz and colleagues [1] recruited a sample of ‘extraordinary altruists’, adults who have donated a kidney to an anonymous stranger. Such individuals

are rare, and their stories fit the textbook definition of behavioral altruism: they undertook significant personal costs to benefit a total stranger. Longstanding theories of altruism posit that empathy is closely linked, suggesting that extraordinary altruists might show extraordinary empathy. The research team tested this hypothesis by comparing altruists with matched controls on neural responses to the anticipation and delivery of pain for self and others. Prior work has linked neural responses to others’ pain with more mundane acts of altruism, like donating \$20 to charity [2].

Relative to controls, altruists showed a higher degree of overlap in neural responses to pain for self and others in the left anterior insula (AI). Altruists also exhibited greater functional coupling than controls between left AI and mid-insula during both vicarious pain and its anticipation. Intriguingly, despite these neural differences, altruists did not differ from controls in self-reported empathy. They did, however, report a significantly higher sense of connectedness with strangers, as measured by inclusion of others in the self, and this sense of connectedness explained many of the neural differences between altruists and controls. Together, these findings point to important differences in self-other processing between extraordinary altruists and the typical population at both phenomenological and neural levels. The results also support a link between empathy and altruism, a topic that has been subject to ongoing controversy, both in the measurement of empathy and in effectively creating opportunities for altruism in a controlled laboratory setting.

Research on the neural correlates of empathy and social cognition more broadly has highlighted both common and distinct substrates for processing the experiences of self and others. Some

of this work attributes prosocial behavior to overlapping neural responses to self and others’ outcomes [1,3]. Other recent work, however, has identified networks that may be specific for social processing [4]. For example, studies of vicarious reward have revealed brain areas that specifically respond to others’ and not one’s own rewards, and responses in other-specific areas covary with empathy and prosocial behavior [5,6]. It would be fascinating to test whether self-other overlap in vicarious experience is a general feature of extraordinary altruism, or whether it is context specific. A further question concerns whether the self-other overlap observed in extraordinary altruists reflects activation of the same neurons, or whether distinct but co-mingling neuronal populations encode outcomes for self versus other. Future studies could address this question with multivariate pattern analysis techniques, such as those used in a recent study to demonstrate that first-hand and empathic pain recruit shared activity patterns in left AI, while right AI carries unique information about the target of pain [7]. This lateralized pattern of responses becomes all the more intriguing in light of new evidence that extraordinary altruists are distinguished from controls in the response patterns of left, but not right, AI [1].

By definition, ‘extraordinary’ altruists are markedly different from typical individuals. It remains unknown whether their behavior, and the neural mechanisms that guide it, differ from the rest of us as a matter of degree or a matter of kind. Recent neuroimaging studies of the neural processes that unfold as ordinary people are making altruistic decisions have identified other neural systems whose engagement predicts altruistic choice. For example, when people distribute money between themselves and others, distinct regions in temporoparietal junction and ventromedial prefrontal cortex encode money for

others and predict generous choices [8]. Likewise, when deciding whether to sacrifice money to spare others from pain, value-sensitive regions including the striatum and lateral prefrontal cortex differentially encode decisions for self and others and predict altruistic behavior [9]. More 'ordinary' acts of altruism may therefore engage rather different mechanisms entirely than extraordinary decisions, which seem to rely on a high degree of phenomenological and neural overlap between self and other. If ordinary and extraordinary altruism differ in kind rather than degree, this raises questions about the level of selflessness that is attainable for most people.

Nevertheless, contemplative traditions advocate that exceptional altruism is achievable through sustained meditative practices that focus on dissolving the boundaries of the self. Such practices have recently been shown to modulate the very same neural processes that

distinguished extraordinary altruists from ordinary folk [10]. Intriguingly, psychedelic substances, particularly those that activate the serotonin system, are also reported to produce profound feelings of connectedness with others and increased overlap in neural correlates of self- and other-processing, although whether this involves similar or different mechanisms to those characterizing meditative practices remains to be seen [10]. These converging lines of evidence connect modern neuroscience with ancient wisdom that transcending the self may ultimately be the key to unlocking the human potential for altruism. What it means to be truly 'selfless' is perhaps even more literal than previously thought.

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