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Intuitive Prosociality

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Abstract
Prosocial behavior is a central feature of human life and a major focus of research across the natural and social sciences. Most theoretical models of prosociality share a common assumption: Humans are instinctively selfish, and prosocial behavior requires exerting reflective control over these basic instincts. However, findings from several scientific disciplines have recently contradicted this view. Rather than requiring control over instinctive selfishness, prosocial behavior appears to stem from processes that are intuitive, reflexive, and even automatic. These observations suggest that our understanding of prosociality should be revised to include the possibility that, in many cases, prosocial behavior—instead of requiring active control over our impulses—represents an impulse of its own.

Keywords
prosociality, altruism, reward, intuition, control

When Lord Tennyson described nature as "red in tooth and claw," he echoed a common view of evolution as favoring ruthless, selfish, and even violent creatures. Yet humans routinely contradict this view through prosociality. Prosociality broadly comprises two distinct but complementary categories. *Prosocial behaviors* constitute any act designed to increase others' well-being, such as cooperating with, sharing resources with, and helping others (Tomasello, 2009). These outward behaviors, in turn, are supported by internal *prosocial preferences*, or people's preference for outcomes that benefit others or uphold prosocial norms (Bolton & Ockenfels, 2000).

Prosociality ranks among our species' most vital, defining features for at least three reasons. First, it is widespread. For instance, U.S. citizens alone donate hundreds of billions of dollars yearly to charitable causes and produce a similar dollar value through volunteer labor (List, 2011). Second, it is nearly universal, extending across many cultures and social contexts (Henrich et al., 2005). Third, the scale of prosociality exhibited by humans is unique, greatly surpassing that of our nearest evolutionary neighbors (e.g., chimpanzees; Warneken & Tomasello, 2009).

And yet humans' prosocial tendency remains puzzling: Why would people routinely choose to forego personal gain to benefit others and exhibit preferences for prosocial outcomes that provide them with no personal gain? Given the ubiquity of human prosociality, it is unsurprising that a vast amount of research across the social sciences has sought to address this question.[1] One popular answer produced by this work is that we humans are especially adept at exerting *reflective control* over our behavior, and this ability to suppress unwanted behavior supports our ability to act prosocially (Stevens & Hauser, 2004). Such models assume that, before acting prosocially, individuals must overcome prepotent, selfish impulses (DeWall, Baumeister, Gailliot, & Maner, 2008; Steinbeis, Bernhardt, & Singer, 2012). In the language of self-control research (Kahneman, 2011; Metcalfe & Mischel, 1999), this model holds that selfishness constitutes an intuitive, hot, or system 1 tendency, and prosociality requires reflective, cool, or system 2 control to quell this tendency.

Fortunately, this *reflective model* of prosociality makes a set of clear, testable predictions about the root causes of prosociality. Robust traditions across psychology and neuroscience have established numerous "markers" that can distinguish between intuitive and controlled behaviors. Classic models from social and cognitive psychology hold that intuitive behaviors occur quickly, in parallel, and in the face of distraction; in contrast, controlled behaviors occur slowly, in serial, and are disrupted by distraction (Bargh & Chartrand, 1999; Chaiken & Trope, 1999; Lieberman, 2007; Shiffrin & Schneider, 1984). More

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recently, neuroscientists have differentiated brain systems that are involved in the exertion of control from those involved in the habitual, intuitive pursuit of goals (Lieberman, 2007; Poldrack & Packard, 2003). Finally, data from developmental psychology demonstrate that controlled behaviors emerge later in childhood than intuitive behaviors (Garon, Bryson, & Smith, 2008).[2]

Over the past few years, numerous studies have directly tested whether prosociality exhibits the markers of intuitive or controlled behaviors. Strikingly—and in stark contrast to the reflective model—this work strongly suggests that prosocial behavior often arises from intuitive, system 1 preferences. Here, we review this empirical challenge to the reflective model, emphasizing three markers that support an *intuitive model* of prosociality: (a) behavioral signs of automaticity, (b) neural signatures of value, and (c) early development.

Behavioral Signs of Automaticity

Intuitive—but not controlled—behaviors demonstrate a number of characteristics associated with automaticity (Bargh & Chartrand, 1999), such as speed and immunity to the presence of distractions. Recently, a number of researchers have examined the nature of prosocial decisions by probing for behavioral markers of automaticity during tasks in which participants may choose between selfish or prosocial outcomes. These studies consistently support an intuitive model of prosocial choices in several ways. First, people tend to make prosocial decisions more quickly than selfish ones (Rand, Greene, & Nowak, 2012). Second, experimental manipulations known to reduce participants' ability to exert control—for instance, inducing time pressure or distraction—increase cooperative and prosocial behavior (Cappelletti, Goth, & Ploner, 2011; Cornelissen, Dewitte, & Warlop, 2011; Rand et al., 2012; Schulz, Fischbacher, Thöni, & Utikal, in press). Finally, orienting people toward intuitive thinking and away from the exertion of reflective control increases cooperation (Rand et al., 2012). Together, these data support the idea that prosociality often represents an intuitive, rather than effortfully controlled, form of decision-making.

Neural Signatures of Value

When people exert reflective control, they typically engage a system of brain regions that includes lateral prefrontal cortex and anterior cingulate cortex (Niendam et al., 2012). This system allows people to control their behavior through modulation of other neural systems, such as those associated with aversive or appetitive affect (Hare, Camerer, & Rangel, 2009; Ochsner & Gross, 2005). If prosociality represents a form of reflective behavior, it likewise should engage regions involved in cognitive control.

Although intuitive behaviors are not supported by a single system of brain regions, scientists do understand a great deal about one prototypical behavior that often does not require control: the pursuit of rewarding goals such as food or money. Reward seeking commonly produces activity in targets of the mesolimbic dopaminergic system, such as ventral striatum and ventromedial prefrontal cortex, associated with the experience of subjective value. Critically, dopaminergic targets are associated with the implicit pursuit of reward even in the absence of explicit knowledge about reward contingencies. For instance, striatal activity supports reward pursuit when people are unable to learn "rules" for acquiring reward because they are distracted or have temporal lobe amnesia (Foerde, Knowlton, & Poldrack, 2006; Knowlton, Mangels, & Squire, 1996). Together, these data suggest that this system is often associated with relatively intuitive, as opposed to controlled, reward seeking (Lieberman, 2007).

Because of this dissociation, patterns of brain activity can help adjudicate between competing accounts of prosocial behaviors. By and large, neuroimaging studies of prosociality have supported a view of prosociality as a form of reward seeking. Ventral striatum and ventromedial prefrontal cortex are reliably engaged by a number of prosocial outcomes—such as observing fair outcomes (Tricomi, Rangel, Camerer, & O'Doherty, 2010) and seeing others receive rewards (Mobbs et al., 2009; Zaki, Lopez, & Mitchell, in press)—suggesting that the experience of reward might underlie prosocial preferences. These same regions are also engaged when people make prosocial choices (e.g., by donating money), even if they incur material costs in doing so (Dawes et al., 2012; Hare, Camerer, Knoepfle, & Rangel, 2010; Zaki & Mitchell, 2011). Finally, prosocial choices commonly fail to engage regions associated with control. Although a few neuroimaging studies have documented cases in which generous choices engage lateral prefrontal cortex (Baumgartner, Knoch, Hotz, Eisenegger, & Fehr, 2011), the lion's share of research in this domain suggests that prosociality does not typically require the suppression of prepotent selfish responding but instead may reflect a form of reward seeking.

Early Development

A final signature of intuitive, as opposed to controlled, behaviors is that they appear early in ontogeny, before children are able to exert significant cognitive control over their actions. Recently, prosocial behavior has been found to squarely meet this criterion. Within the first year of life, children exhibit prosocial preferences, for instance

favoring agents who act prosocially toward others over antisocial agents (Hamlin, Wynn, & Bloom, 2007). By 18 months of age, children also commonly engage in spontaneous prosocial behavior, for instance helping others in need (e.g., opening a cabinet for someone whose hands are full) and spontaneously offering others useful information (e.g., concerning the location of a desired object; see Warneken & Tomasello, 2009). Slightly older children further engage in more complex prosocial actions in order to uphold justice (e.g., discarding resources rather than distributing them inequitably; Shaw & Olson, 2012). This pattern holds even when prosocial behaviors are costly and children are neither prompted to act prosocially nor rewarded for doing so (Warneken & Tomasello, 2009). In fact, providing small children with rewards for prosociality can actually reduce subsequent helping behavior (Warneken & Tomasello, 2009), consistent with the phenomenon of "overjustification," in which providing extrinsic rewards for an already enjoyable behavior reduces subsequent interest in that behavior (Lepper, Greene, & Nisbett, 1973).

The developmental emergence of prosociality supports an intuitive model of prosocial behavior inasmuch as children produce generous and fair choices before they are able to exert reflective control over their behavior. Although almost no work directly examines the developmental time course of control and prosociality in tandem, extant data indirectly support a view of prosociality as preceding many forms of control. For instance, whereas toddlers at 18 months of age display some forms of prosocial behavior, many classes of executive function—including delay of gratification—seem to come online later, between 22 and 48 months of age (Garon et al., 2008).

Reconsidering the Roots of Prosociality

Humans are a remarkably generous species, a fact that has both fascinated and perplexed scientists and philosophers for centuries. Theorists have commonly concluded that humans' prosocial tendencies result from domain-general control abilities, such as prospection, planning, and delay of gratification. That is, we may share selfish impulses with other species, but are alone in our ability to suppress such impulses through effortful control (Stevens & Hauser, 2004).

Here we present a new and different view of prosocial behavior, one that focuses on prosociality as an intuitive aspect of human social life. An intuitive model suggests that human prosociality might reflect the adaptation of evolutionarily older mechanisms—such as reward seeking—to interpersonal contexts (de Waal, 2008; Zaki & Ochsner, 2012). This prediction is supported by at least three markers of intuitive behavior spanning behavioral economics, cognitive neuroscience, and developmental psychology. First, prosocial behaviors demonstrate behavioral signatures of automaticity, including speed and robustness to distraction. Second, rather than engaging lateral prefrontal neural structures associated with effortful control, prosocial behaviors more commonly engage targets of the mesolimbic dopaminergic system associated with value and reward-seeking. Third, prosocial tendencies emerge quite early in children's development, before most forms of cognitive control.

Of course, none of these markers alone provides a conclusive case for prosociality as an intuitive phenomenon. For instance, the engagement of mesolimbic dopaminergic targets does not always correlate with the experience of subjective value, and the generous acts of young children could reflect a history of learning that such behaviors produce favorable self-oriented outcomes rather than an intuitive preference for generosity. However, the convergence of evidence across the three domains described here suggests that an intuitive model of prosociality deserves to be taken seriously. More broadly, an intuitive model provides a parsimonious mechanism for the emergence of adaptive social behavior over the course of evolution. Intuitive, reward-based motives for prosocial behavior could have allowed humans to cultivate positive long-term outcomes (e.g., cooperation and reciprocity) even in the absence of explicit long-term planning (DeSteno, 2009; Trivers, 1971).

Our species, of course, is not defined by prosociality alone; humans cheat, steal, lie, and murder with disheartening regularity. Indeed, the idea that prosociality can be intuitive in no way implies that it always is. In some cases, people may intuitively tend toward selfishness and exert control to act prosocially, consistent with the reflective model. Research from a number of domains reviewed here provides such cases. For instance, a few studies have demonstrated that engaging in strategic social behavior engages neural systems associated with control (Baumgartner et al., 2011; Spitzer, Fischbacher, Herrnberger, Gron, & Fehr, 2007). Likewise, young children are not ubiquitously prosocial creatures and in many cases fail to act prosocially (Smith, Blake, & Harris, 2013) or do so only to improve their reputation (Leimgruber, Shaw, Santos, & Olson, 2012). Together, such cases attest to the nonuniversality of intuitive prosociality.

This contrasting evidence highlights the need to explore not only whether our prosocial behaviors can be intuitive but also the contextual moderators that determine when our intuitions favor prosocial or selfish choices. Rand et al. (2012) recently provided a compelling demonstration of just such boundary conditions:

People with a history of cooperative, but not uncooperative, interpersonal interactions demonstrate behavioral indices of prosocial intuition. Extant data suggest other, similar factors: for instance, threats of punishment and the salience of social rules could increase the role of control in supporting prosociality, and—in young children—the need to sacrifice material resources to act prosocially may render such actions less intuitive.

Conclusion

For over a century, the Carnegie Hero Fund has awarded medals to people who "voluntarily risk [their] own [lives], knowingly . . . while saving or attempting to save the life of another person," for instance, by jumping onto a subway track to save a stranger from an oncoming train. In a recent interview, the secretary of the Hero Fund was asked to identify patterns amongst the stories of heroism he so often encounters. A major component he elected is a lack of thinking: Many Carnegie Heroes routinely fail to weigh the risks and benefits of their actions and simply feel "compelled to act" (Radiolab, 2010).

Most theoretical accounts of prosociality instead assume that humans act kindly toward each other because of our species' ability to control selfish impulses. However, new evidence across neuroscience and psychology suggests an alternative account more in line with that of the Carnegie Heroes: In many cases, prosocial acts, instead of requiring control over selfish impulses, may represent a class of intuition in and of themselves.

Recommended Reading

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Fehr, E., & Camerer, C. F. (2007). Social neuroeconomics: The neural circuitry of social preferences. *Trends in Cognitive Sciences*, *11*, 419–427. A summary of neuroscience research on preferences for prosociality and the engagement of mesolimbic dopaminergic targets.

Rand, D. G., Greene, J. D., & Nowak, M. A. (2012). (See References). A recent study elegantly describing and exploring the use of reaction time measures to probe the intuitive nature of cooperative decisions.

Tomasello, M. (2009). (See References). A thorough and accessible survey of research and theory on prosociality.

Warneken, F., & Tomasello, M. (2009). (See References). A well-organized summary of evidence characterizing prosocial tendencies in young children and nonhuman primates.

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Notes

1. Note that this question—and indeed the majority of research covered here—focuses on proximate motives that cause a person to behave prosocially, not on the ultimate factors that render prosocial behavior evolutionarily adaptive.
2. Although intuitive and reflective behaviors can be separated by behavioral and neural markers, this does not imply that intuition or control are fully encapsulated psychological or physiological "modules" as described by Fodor (1983).

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