

violation, leading other actors to express similar – or higher – levels of outrage.

In sum, market models of morality are indeed powerful – more powerful even than Baumard et al. recognize, for such models can not only explain the evolution of mutualistic cooperation and the emotions that support it, but, importantly, they can also explain the vicissitudes of morality both within and between individuals, groups, and societies.

More to morality than mutualism: Consistent contributors exist and they can inspire costly generosity in others

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Abstract: Studies of economic decision-making have revealed the existence of consistent contributors, who always make contributions to the collective good. It is difficult to understand such behavior in terms of mutualistic motives. Furthermore, consistent contributors can elicit apparently altruistic behavior from others. Therefore, although mutualistic motives are likely an important contributor to moral action, there is more to morality than mutualism.

We applaud the effort of Baumard et al. to move beyond the question of *whether* people cooperate (they do, often) to examine *why* people cooperate. We do not dispute their arguments that cooperation sometimes stems from either selfish or fairness motives. Nevertheless, studies of economic decision-making reveal phenomena that are not easily understood in terms of the mutualism framework's notion that interactants aim to "share the costs and benefits of cooperation equally" (target article, Abstract), behaving "*as if* they had passed a contract" (sect. 3.2.2, para. 1, italics in original).

Particularly problematic is the existence of *consistent contributors* (CCs; Weber & Murnighan 2008). CCs are individuals who *always* contribute to the group in the context of a Public Goods Game (PGG), regardless of others' behavior. CCs have been shown to emerge in non-trivial numbers in economic games. Because their generosity is not dependent on cooperation by others, they place themselves at great of risk incurring more costs and deriving fewer benefits than others in their group. If CCs were motivated by fairness, one would expect that over time they would reduce their contributions to match those of others. Yet, they do not. Thus, their existence poses a problem for Baumard et al.'s argument that fairness considerations dominate in environments that afford cooperative opportunities. CCs do not give the impression that they have passed a contract with the other parties. It would be a strange contract indeed that stipulates: "I will contribute to the group regardless of what you do."

Importantly, CCs can increase cooperation by others (Weber & Murnighan 2008). Recent research in our labs supports a dynamic "person X situation" model of how this happens (Packer & Gill 2011). According to our model, individual differences in moral values interact with the situationally triggered salience of moral concerns to guide cognition and behavior. A key facet of our model is the notion that people can approach a decision-making task in distinct mindsets (e.g., Tetlock 2002): For example, a *moral mind-set* in which they focus on *what is the morally correct choice*, or a *pragmatic mind-set* in which they focus on *what are the practical costs and benefits of each choice* (Van

Bavel et al. 2012). We suggest that, perhaps because costly generosity epitomizes lay conceptions of moral action (Olivola & Shafir, in press), CCs activate a moral mind-set in participants. Once this mind-set is activated, cognition and decision-making are guided by the individual's moral values, and thus those with strong altruistic values show a robust pattern of cooperation.

We have tested this model using a PGG in which human participants interact with computer-simulated players. Results support our model, such that the presence of a CC increases cooperation *only* among individuals with preexisting altruistic moral values. Interestingly, such individuals are *not* more cooperative than others in the absence of a CC (despite the fact that overall rates of cooperation are held constant across CC and non-CC conditions). Ongoing work is exploring the motivational basis of the cooperation elicited by CCs. Preliminary evidence suggests that the motives might be altruistic rather than fairness-based. In particular, CCs increase cooperation among those with altruistic values *even when other group members continue to defect with regularity*. Thus, those with altruistic values, like the CCs who activate those values, end up bearing more costs and deriving fewer benefits than those who continue to defect. This raises questions about whether their behavior can be understood in terms of mutualistic concerns.

Consistent contributors and their tendency to elicit cooperation from (at least some) others suggests that a general disposition to cooperate can evolve. Baumard et al. propose a two-step model for the evolution of morality in environments where people can choose their interaction partners: A selfishly motivated and calculative reciprocity first emerges, which is subsequently replaced by a "disposition to be intrinsically motivated to be fair" (sect. 2.2.1, para. 12). Importantly, even if one fully accepts this model, when a sufficient proportion of a population reaches the second step, it may set the stage for a third in which a more general or altruistic disposition to cooperate can evolve. Among a population concerned about fairness, a mutant who consistently cooperates is less likely to be exploited, but instead can trigger increased cooperation. That is, an evolved disposition to cooperate fairly creates an environment within which a more general disposition to cooperate may be adaptive. Indeed, to the extent that consistently contributing individuals are popular choices as interaction partners, a selection pressure in favor of consistent contribution might emerge. Following the authors' reasoning, the more genuine this disposition, the better; hence, we would suggest that a true preference for sharing resources with others is likely to evolve among some members of the population.

Although their motivation is substantially altruistic (i.e., they are willing to bear more costs and derive fewer benefits than others), we suspect that individuals with a general or altruistic disposition to cooperate are likely to exhibit some behaviors that are consistent with the mutualistic framework. First, we hypothesize that although these individuals often tend to cooperate regardless of others' decisions during specific interactions, they are still likely to pay close attention to others' responses and choose to interact with people they trust to respond fairly or altruistically. Second, these individuals are also likely to be sensitive to cooperative environmental affordances; that is, they may tend to cooperate only in contexts where cooperation is possible (e.g., contributions have a reasonable chance of being reciprocated) and likely to increase benefits. Weber and Murnighan (2008) observed this type of strategic cooperation, such that rates of consistent contribution in a PGG increased as the potential payoffs for cooperating increased (although there were still a non-trivial number of consistent contributors when potential payoffs were low).

To sum up, consistent contributors exist, and it is difficult to understand their behavior in terms of mutualistic motives. Further, consistent contributors often elicit cooperation from others, and that elicited cooperation might also have an altruistic basis. We would, therefore, suggest that Baumard et al.'s mutualism framework is a very useful but not complete approach to human morality.