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Prosocial signaling and cooperation among Martu hunters



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ABSTRACT

Among immediate-return societies, cooperative social relationships are maintained despite the lack of centralized authority, strong norms of ownership and the punishment of free-riders. The prosocial signaling theory of cooperation solves the puzzle of social cohesion in such societies by suggesting that costly forms of generosity can function as an honest signal of prosocial intent, and that the reputations for prosociality signalers build generate trust between individuals, supporting the formation of cooperative partnerships. However, not all forms of costly generosity are prosocial: we contrast two types of generosity, aggrandizing and prosocial, and suggest that only prosocial generosity provides benefits through cooperation. Prosocial generosity is accompanied by pecuniary distancing: the payment of a higher relative cost to share, and a manner of sharing that disengages the acquirer from ownership over the rights to benefit from his or her harvest. We test the prosocial sharing hypothesis among Martu hunters and find that there is a significant association between the propensity of an individual to share a higher proportion of her income and centrality in the cooperative hunting network. Those who consistently pay higher costs to share, not necessarily those who are better hunters, are preferred partners for cooperative hunting. While many have emphasized the direct, status enhancing, competitive aspects of generosity, we suggest here that prosocial generosity produces benefits indirectly, through the formation of trusting, cooperative partnerships.

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1. Introduction

Under circumstances where there are no centralized institutions that ensure cooperation and promote social solidarity, how do societies remain cohesive? A substantial body of theoretical literature suggests one solution: that social cohesion is in part maintained by strong links between generosity and cooperation, generated through the honest signaling of one's intrinsic quality (Barclay, 2004, 2013; Boone, 1998; Gintis, Smith, & Bowles, 2001; Lotem, Fishman, & Stone, 2003; Macfarlan, Quinlan, & Remiker, 2013; Panchanathan & Boyd, 2004). Much of this work has focused on how seemingly costly forms of generosity, those that are performed in ways that minimize the possibility of reciprocation (such as public goods provisioning), may be an evolutionarily stable strategy under a wide range of conditions. The proposed benefits for such signaling lie in the trust that a generous individual will play fair, facilitating the formation of cooperative partnerships in other ventures. Empirical support for the prosocial signaling theory of cooperation has primarily come from experimental games, where subjects often choose to cooperate more often with those who have established themselves as more generous (Barclay & Willer, 2007; Klapwijk & Van Lange, 2009; Sylwester & Roberts, 2013; Wedekind & Milinski, 2000; Willer, 2009). Here, generosity is a strategic cost that signalers pay to influence receivers to act cooperatively toward them; the

guarantee for honesty is the potential cost to one's reputation for cheating (see Számádó, 2011).

However, the design of such games has tended to make it difficult to disentangle the pathways of benefit: do generous individuals gain rewards because they are trusted cooperation partners, or because others defer to them as a result of their display of intrinsic quality? While recent work supports the formation of trust for future cooperative partnerships as the main content of the signal (Fehrler & Przepiorka, 2013), there are also cases where generosity appears to operate more as a conspicuous display of quality, meant to enhance the prestige or social dominance of the donor (Hardy, 2006; Hawkes & Bird, 2002; Mauss, 1954; Milinski, Semmann, & Krambeck, 2002; Vugt & Hardy, 2010). As others have pointed out (Sugiyama & Sugiyama, 2003), and one of us has suggested for Meriam turtle hunting (Smith, Bird, & Bird, 2003), signaling one's prowess and skill may not result in cooperative outcomes because such signaling is designed primarily to establish competitive hierarchies between individuals, a form of personal aggrandizing.

As Smith et al. (2003) point out, Meriam turtle hunting carries two kinds of informative signals, sent by the ability of the hunter to pay different types of costs. Competitive (or aggrandizing) signals sent through the cost of hunting make visible the skill and ability of the hunter, particularly those who play the roles of jumper and hunt leader; more skillful individuals pay a lower cost to hunt than less skilled individuals. Prosocial signals sent through the cost of sharing the entire turtle makes visible one's political motives and prosocial motivations, mainly for hunt leaders. The material cost inherent in the way the turtle is distributed, in the hunter donating his labor to a feast-holder, in giving

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away a whole live turtle so that all can see he took nothing for himself, all provides information to others. Men who pay such high costs to supply another's feast are indexing their support of the feast-giver; the fact that they distance themselves from distribution and from expectations of return in kind is a major component of the costly signal that allows the feast-giver to trust that the hunter values the possibility of future social interaction or cooperation more than taking an immediate individual benefit. Importantly, what the hunter is doing is visibly distancing himself from the perks of ownership, the rights to control who receives how much of the turtle, including himself. This visible distancing, so common among successful hunters in immediate-return societies, is the opposite of what we might expect to see if the display of hunter skill was entirely a form of personal aggrandizement. As such, the term competitive altruism, often used in the literature on signaling and cooperation, which includes both competitive feasting and instances of what seem to be costly sharing (Barclay, 2004), collapses two very different modes of signaling: those that are aggrandizing, and those that involve pecuniary distancing.

Signaling theory suggests that key to the prosocial nature of generosity is that it is kept honest through a kind of pecuniary disinterest: a distancing of the signaler from the immediate material and immaterial profits of his or her own production (Bird & Bliege Bird, 2010; Gambetta, 2009). This distancing puts reciprocity at risk, and it is this risk that engenders trust, which provides a wide range of benefits in social interaction (Molm, Collett, & Schaefer, 2007a; Molm, Takahashi, & Peterson, 2000). Opening yourself up to potential loss in the short term is one way to let others know that you are not out for the selfish, short-term gain in social interactions. One way to accomplish this is to produce large amounts of food but conspicuously avoid profiting from that production by giving much of it away. Key to the honesty of the cost paid is that one shares a higher proportion of one's income, not simply more in an absolute sense. While aggrandizing signals often involve giving away more than others, as in competitive feasting (Boone, 1998; Dietler & Hayden, 2010; Smith & Bird, 2000) paying absolutely more than everyone else does not necessarily guarantee any prosocial intent if that cost is more easily paid. Instead, the honesty of a prosocial signal is determined by the relative cost endured: those who pay personally greater costs are those who should be trusted in cooperative partnerships.

Another important component of pecuniary distancing lies in the way sharing is conducted. Building trust takes more than a single act of costly sharing: the truly prosocial sharer not only takes on the relatively higher cost of the act, she also expects no immediate payback contingent upon the provisioning of the collective good, either in deference (prestige) or in kind. Demonstrating this additional hidden quality requires cumulative signaling in ways that tell others that one's generosity does not come with hidden strings attached. Sharing in costly ways expecting to extract benefits from others contingent on the gift is a form of manipulation, not a demonstration of prosocial intent (Cronk, 1994). One of the most straightforward ways to distance one's self from the possibility of contingent sharing is to contribute to the provisioning of public goods (Smith & Bliege Bird, 2006). Other ways to subvert the manipulative power of the gift (Mauss, 1954) are to distance one's self from ownership over production by giving up all rights to distribute the goods in question, essentially making a potentially private good a collective good (Hawkes, 1993). Among many hunter gatherers, the sharing of especially large items is accomplished by someone other than the acquirer. Hunters of large animals are particularly likely to divest themselves of ownership by dropping the prey at the edge of camp, and quietly drawing no attention to their successful harvest (Hawkes, 2001). They do not participate in distribution, leaving others to determine how large a share they will receive of their own prey, and do not participate in deciding how large portions are to be that go to others (Bird & Bliege Bird, 2010). We suggest that there are at least two forms of pecuniary disinterest that ensure honesty of cooperative intent: *disinterested distribution* — a lack of obvious interest in contingent giving and immediate repayment (in material or immaterial

benefits), and *costly sharing* — taking on relatively greater (but not necessarily absolutely greater) costs to benefit others.

Just as aggrandizing and prosocial signals are sent through a different set and scale of costs, so too do they result in a different set and scale of benefits. Aggrandizing signals of skill typically result in greater prestige and advancement in competitive hierarchies, which helps signalers garner attention and deference from others (Henrich & Gil-White, 2001; Macfarlan, Remiker, & Quinlan, 2012; Plourde, 2008). Prosocial signals may similarly result in heightened prestige for those who can cultivate a reputation for generosity, but the more crucial benefit may be heightened social support through the trust such signals engender. For the Meriam, it is not the competitive signals of hunter skill, but the distribution of the turtle that provides the real political benefits. As hunters themselves say, being a hunt leader that provides turtles for feasts, "ensures the old men will listen to you in meetings and support you in disputes over land, and impresses them enough to let you marry the best girl." Beyond these political benefits, empirical work suggests that while those who share more may receive benefits through bettering their position in competitive hierarchies, those who pay higher costs to share, not necessarily those who share the most, will be more likely to gain the benefits of cooperation. Gurven and colleagues (Gurven, Allen-Arave, Hill, & Hurtado, 2000) explored the relationship between generosity and the chances of receiving food when ill and found that it was those who shared a higher proportion of their production, regardless of how much of the absolute amount was shared, that were likely to be cared for when unable to produce themselves. Only those who had paid the higher relative cost in their sharing were identified as truly generous, and so received help from others confident in their cooperative partnerships. Similarly, Lyle and Smith (2014) found that contributions to public goods in an Andean village built reputations that led to greater access to cooperative partnerships, which, in turn, ultimately provided greater health-buffering benefits. Prosocial signals, then, not only build reputational standing (as aggrandizing signals do), but also appear to foster trusting, supportive relationships that have demonstrable impacts on people's livelihoods. In prosocial display, benefits do not come directly, via the generous act, but indirectly, through the benefits gained from cooperating with others. In contrast, an aggrandizing show-off would gain benefits mainly through producing more than others, sharing more but keeping more as well (Hawkes, 1991). Or, an aggrandizing producer might share only to extract obligatory repayments from others, leveraging the power of the gift to get more material benefits in return.

Here, we test predictions of the prosocial signaling theory of cooperation among Australian Western Desert Martu, asking whether those who share more reap the benefits of cooperation, and whether these social benefits are gained through aggrandizing or prosocial generosity. Are aggrandizing show-offs or pecuniary distancers more likely to be rewarded for production via cooperative partnership formation? Are those who share inducing obligatory repayment or generating trust?

1.1. Predictions

Our analysis focuses on cooperation and sharing in the small-prey hunting context (sandplain foot hunting). To hunt small prey on foot, Martu form dinner camps, remote temporary hunting camps several kilometers distant from the main community where the products of the day's hunt are cooked and consumed as a shared meal (see (Bird, Bliege Bird, & Coddling, 2009) for details). Such hunting is dominated by women, although some men, especially older men, actively hunt small prey, bringing in about 30% of the small game calories (Bliege Bird & Bird, 2008). Individual camp members arrive at the central place either on foot or by vehicle, radiate outward from the camp to hunt or collect plant foods, and then rendezvous back at the camp at the end of the day. Dinner camps range in size from 4 to 20 people, with almost all of those present, including children older than about 5 or 6, actively working to acquire food for the shared meal. Hunters tend to leave at the same time

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