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Punitive sentiment among the Shuar and in industrialized societies: cross-cultural similarities

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Abstract

Cross-cultural diversity in economic game behavior has been cited as evidence that humans do not possess psychological adaptations specialized for cooperation in collective actions (CAs). In this paper, it is argued that such adaptations may, in fact, exist and that their design may be illuminated by the appropriate kinds of cross-cultural data. To exemplify an aspect of cooperation that may not vary cross culturally, data are provided suggesting that, in the CAs of Shuar hunter–horticulturists, punitive sentiment towards free riders takes a form similar to that which it takes in industrialized societies: It is experienced mainly by high contributors and directed mainly at CA beneficiaries who could have contributed highly but chose not to. If anti-free-rider punitive sentiment is essentially similar cross culturally, then it may be the product of a species-typical psychological mechanism specialized for such sentiment. How such a mechanism may have evolved is discussed.

Keywords: Collective action; Punishment; Altruism; Evolution of cooperation

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1. Introduction: To what extent are cooperative behaviors cross-culturally universal?

Many researchers agree that humans engage in cooperative behavior to an extent that is beyond the explanatory reach of widely accepted evolutionary theories, such as kin altruism (Hamilton, 1964; Williams & Williams, 1957) and dyadic reciprocal altruism (Trivers, 1971). Recent attention has focused on the origins of collective action (CA), defined here as three or more (not necessarily genetically related) individuals jointly producing a resource to be shared equally among themselves. A CA participant can cooperate by contributing directly to resource production and/or by punishing low contributors. Punishment motivates increased contributions from would-be free riders (review in Gintis, 2000) and is thus "altruistic" in the sense that it, like contribution effort, produces resources for coparticipants. Because both contribution and punishment benefit one's coparticipants as much as one's self, both are puzzling from the perspective of individual fitness promotion (Gintis, Bowles, Boyd, & Fehr, 2003; Olson, 1965). The puzzle exists because if all participants receive equal shares of the resource, then each participant's net benefit depends solely on his or her cost of cooperativeness (contribution and/or punishment effort), with lower spending free riders advantaged over higher spenders.

Despite the free-rider problem, participants in experimental CAs, at least in industrialized societies, commonly engage in costly contribution and punishment of low contributors (e.g., Fehr & Gächter, 2002; Ostrom, Walker, & Gardner, 1992; Yamagishi, 1986). In fact, these behaviors seem so widespread that they have been explained as biological adaptations, albeit fitness-damaging ones that evolved by group selection (Gintis, 2000; Sober & Wilson, 1998). Explanations for behavior that require group selection to overcome individual fitness deficits, however, are more onerous than those invoking individual fitness advantages (Tooby & Cosmides, 1996; Williams, 1966), and cultural evolutionary and gene–culture coevolutionary theories have been proposed as alternative explanations for contribution and punishment (reviews in Boyd, Gintis, Bowles, & Richerson, 2003; Fehr & Fischbacher, 2003; Henrich, 2004). Proponents of these theories emphasize data from small-scale societies that suggest cross-cultural variability in levels of cooperation in experimental economic games (e.g., Henrich, 2000; Henrich et al., 2001), and they argue that this variation implies the absence of species-typical psychological adaptations specialized for CA.

However, studies may suggest high cross-cultural variation in cooperative behavior simply because they are failing to detect the aspects of this behavior that do *not* vary. For example, while homicide rates vary widely cross culturally, in all cultures, the killers are usually young men, and this uniformity may be due to the evolved features of male psychology related to intrasexual competition and risk taking (Daly & Wilson, 1988, 2001). Similarly, varying rates of cooperativeness cross culturally could be generated by an evolved psychology of cooperativeness. Imagine, for example, that in all cultures, CA participants engage in reciprocal altruism according to the decision rule "cooperate to the extent to which you expect your average coparticipant to cooperate." However, if environments vary in the extent to which they provide economic incentives to cooperate, then cooperation may be more common in some cultures, and there will be cross-cultural variation in the degree to which participants expect coparticipants to cooperate. A study that measured the decision rule itself would detect similarity cross culturally, while one that measured absolute levels of

cooperation would detect variation. Both studies would be informative about the information-processing specifications of the underlying psychological mechanism, and it would be wrong to conclude, based on the study that detected variation, that cooperative behavior was not the product of a psychological mechanism specialized for cooperation.

The main goal of this paper was to identify an aspect of CA participation that may not vary cross-culturally: punitive sentiment towards free riders. In both industrialized societies and among hunter–horticulturalist Shuar in the Ecuadorian Amazon, punitive sentiment is experienced mainly by high contributors and directed mainly towards CA beneficiaries who *could* have contributed highly but who *chose* not to. If this sentiment is essentially similar cross-culturally, then it may be the product of a species-typical psychological mechanism specialized for generating such sentiment. Discussion will focus on how such a mechanism may have evolved.

1.1. Is anti-free-rider punitive sentiment similar cross culturally?

Punitive sentiments and behavior towards free riders have been observed in both western and nonwestern societies, and in both small-scale and industrial societies, including regions of Japan (Yamagishi, 1986, 1988), Europe (Decker, Stiehler, & Strobel, 2003; Falk, Fehr, & Fischbacher, 2001; Fehr & Gächter, 2000), the United States (Masclet, Noussair, Tucker, & Villeval, 2003; Sefton, Shupp, & Walker, 2002), Latin America (Erasmus, 1977; Price, 2003, in press), and Africa (Erasmus, 1977; Ostrom, 1990, 2000). Ostrom (2000, p. 138) summarizes the cross-cultural evidence:

> Extensive fieldwork has by now established that individuals in all walks of life and all parts of the world voluntarily organize themselves [for CA]. . .Field research also confirms that the temptation to free ride on the provision of collective benefits is a universal problem. In all known self-organized resource governance regimes that have survived for multiple generations, participants invest resources in monitoring and sanctioning the actions of each other so as to reduce the probability of free riding.

The actual biological adaptation, that is, the functional aspect of the phenotype, that produces most punishment in CAs appears to be an emotional system causing anti-free-rider punitive sentiment (Price, Cosmides, & Tooby, 2002). When experimental participants are given opportunities to punish free riders, this sentiment motivates punishment behavior (Fehr & Fischbacher, 2004; Fehr & Gächter, 2002; Masclet et al., 2003; Shinada, Yamagishi, & Ohmura, in press). Even when actual punishment of free riders does not occur, punitive sentiment may still be experienced and may lead contributors to defect:

> Without exception, members of ex-collectives I talked with in both Latin America and Africa described the free rider phenomenon as the main cause of failure. . .[They made statements such as] 'Some worked more than others, but all were paid the same' [Venezuela]; 'Collectives will always fail because some people do not work hard and others then become angry' [Ghana]. (Erasmus, 1977, p. 309).

While there do appear to be broad cross-cultural similarities in patterns of punitive sentiment in CAs, a lack of precise data about this sentiment from small-scale societies makes it harder to assess

the extent to which it may be produced by a functionally specialized, species-typical psychological mechanism. The following study presents such data in hopes of illuminating this issue.

1.2. Punitive sentiment among the Shuar

Study participants were from a Shuar village (population 300) in the Ecuadorian province of Morona Santiago. These villagers are, in some ways, typical Amazonian hunter–horticulturalists, their most important crops being plantains and sweet manioc. Most residents are closely related descendents of the two brothers who founded the village, and the average coefficient of relatedness in the village was .045 (for reference, second cousins are related by a coefficient of .031). Like many Andean/Amazonian groups, they regularly practice traditional CAs called *mingas*, in which participants work towards some collective goal, for example, clearing a field or building a house. This study focused on an association of sugarcane cultivators (*cañicultores*), who, once or twice weekly, would hold a minga in which they used machetes to clear their fields of weeds. The expected benefits of membership were an equal share of the profits from sugarcane sales, while the costs were participating in mingas or being fined US$2 per absence (a significant amount, equivalent to what a Shuar could make in one day working as a farmhand for a non-Shuar).

Is the anti-free-rider punitive sentiment experienced by minga participants similar to that experienced by CA participants in industrialized societies? In industrialized societies, punitiveness is mainly experienced by high contributors and targeted at low contributors (Falk et al., 2001; Fehr & Gächter, 2002; Gintis et al., 2003; Masclet et al., 2003), and there is a positive correlation between the punisher's contribution and the extent of his or her punitiveness (Decker et al., 2003; Price et al., 2002; Shinada et al., in press). Not all low contributors are perceived as free riders, however, only those regarded as beneficiaries of the CA who could have contributed highly but who chose not to (Price et al., 2002). That is, the intentionality of the low contribution matters, and only intentional low contributions are considered punishment worthy (Dufwenberg & Kirchsteiger, 1999; Rabin, 1993; review in Gintis et al., 2003). If a goal of punishment were to evoke contributions from would-be free riders (Boyd & Richerson, 1992; Gintis, 2000), then such consideration of intentionality would make sense because punishment effort would be wasted on those unable to contribute.

If punitive sentiment in mingas is similar to that experienced in industrialized CAs, then the following hypotheses should be supported: (1) higher contributors in mingas experience more punitive sentiment towards perceived free riders, and (2) only intentional low contributions are regarded as punishment-worthy free riding.

2. Methods

2.1. Study participants

The cañicultores association consisted of 13 members, and data were collected from all members. Membership was voluntary and limited to official "citizens" (*socios*) of the

community. Because people are usually not elected socios until their twenties, all members were adults, 29.5 to 54.5 years old ($\bar{x}$=38). Machete work in mingas is traditionally considered men's work, and most members (12 of 13) were male. Although all members were native Shuar speakers, all were fluent in Spanish.

2.2. Variables

The dependent measures included each member's degree of punitive sentiment towards free riders (PUNISH), number of days worked in mingas (DAYS PRESENT), and unexcused absences from mingas (UNEXCUSED ABSENCES). All variables passed the Shapiro–Wilk test for distribution normality.

PUNISH was assayed as each member's response to the question: "I want to know your opinion about how much the fine should be if a member is inexcusably absent from a minga. And, let's suppose that the opinions of the other cañicultores don't matter; this is your opinion, nothing more" (translated from Spanish). The value of PUNISH was how much each member said the fine should be lowered or raised from its actual US$2.00 amount (range=−US$1.20 to 2.00, $\bar{x}$=US$.51, S.D.=US$1.12).

DAYS PRESENT and UNEXCUSED ABSENCES were based on minga attendance records kept by the association secretary. At the outset of the study, the association had completed 22 mingas over 5 months. For each minga, members were recorded "present" (*presente*), "inexcusably absent" (*falta*), or "excusably absent" (*justificado*). Justificados are due to sickness or injury and, unlike faltas, are not punished. DAYS PRESENT was the total number of presentes recorded for each member (range=10 to 19, $\bar{x}$=15.46, S.D.=2.88), and UNEXCUSED ABSENCES was the total number of faltas (range=2 to 7, $\bar{x}$=4.31, S.D.=1.60). The reason for calculating unexcused absences was as follows. The above hypothesis predicts a positive correlation between DAYS PRESENT and PUNISH, but this correlation might be due not to people high in DAYS PRESENT being more punitive, but rather to people high in UNEXCUSED ABSENCES being less punitive: DAYS PRESENT and UNEXCUSED ABSENCES should be negatively correlated, and it would not be surprising if free riders were relatively unenthusiastic about harsh punishment of free riding. Thus, to measure the direct effect of DAYS PRESENT on PUNISH, it is necessary to control for the relationship between UNEXCUSED ABSENCES and PUNISH.

3. Results

As Fig. 1 shows, DAYS PRESENT was positively correlated with PUNISH (Pearson's r=.74, P=.002; all P values are one tailed). This correlation is due to higher contributors being *more* punitive, not to free riders being *less* punitive: UNEXCUSED ABSENCES did not account for the variance in PUNISH after controlling for DAYS PRESENT [part (semipartial) r=−.18, P=.199), while DAYS PRESENT explained a significant proportion of the variance in PUNISH after controlling for UNEXCUSED ABSENCES (part r=.59,

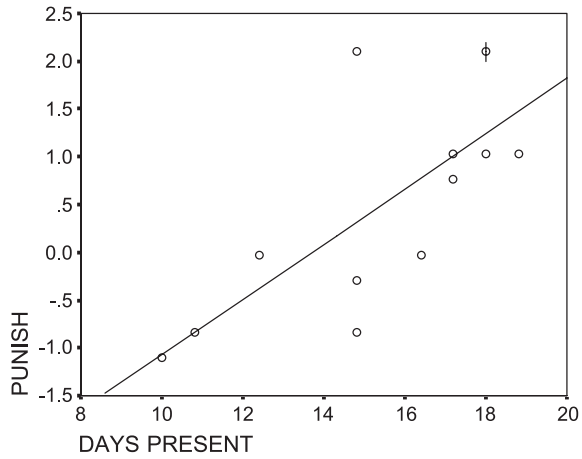

Fig. 1. PUNISH plotted against DAYS PRESENT for 22 mingas, with regression line. Association members (N=13; the bisected point represents two participants) who had attended more mingas supported relatively higher fines for unexcused absences. As in industrialized societies, higher contributors are more punitive towards free riders (Decker et al., 2003; Price et al., 2002; Shinada et al., in press).

P=.008). Thus, as predicted in the first hypothesis, higher contributors experienced more punitive sentiment towards perceived free riders.

To test the second hypothesis, one need only consider that the Shuar categorize minga absences as either excused (justificado) and not punishment worthy, or unexcused (falta) and punishment worthy. The former category is used if the absence is "unintentional," that is, due to some incapacitating condition that the member did not voluntarily bring upon him- or herself. The latter category is reserved for "intentional" absences, that is, if the member is perceived to have been capable of contributing and have chosen not to. (For further investigation of differences in how intentional and unintentional absences are perceived, see Price, in press, which suggests that members accurately distinguish between these two kinds of absences in their efforts to monitor comember contributions, and also that, while intentional absences are reputation damaging, unintentional absences are not). Thus, in mingas, as predicted in the second hypothesis above, free riding is defined in terms of intentionality, and only intentional low contributions are regarded as punishment worthy.

4. Discussion

4.1. Why might punitive sentiment be similar cross culturally?

The above results suggest that anti-free-rider punitive sentiment in one small-scale society is similar to that in industrialized societies. These results also seem broadly consistent with the way that punitive sentiment is described by the cross-cultural researchers quoted above. However, more data are needed, especially because the present study's

sample size was small due to limited membership in the cañicultores association. Future cross-cultural examinations would provide welcome additional evidence about this sentiment's universality.

As discussed above, some researchers believe that administering punishment would have been individually fitness damaging in ancestral CAs, and therefore, that individual-level adaptations specialized for punitive sentiments and behaviors are unlikely (e.g., Boyd & Richerson, 1985; Gintis et al., 2003). This belief has led some of these researchers to propose biological group selectionist explanations for punishment (Gintis, 2000; Sober & Wilson, 1998), but theoretical difficulties associated with such selection have led many to agree that some gene–culture coevolutionary scenario is more plausible (e.g., Boyd et al., 2003; Fehr & Fischbacher, 2003). However, if the nature and design of punitive sentiment is similar cross culturally, then invoking cultural evolution as part of the explanation for its existence may be superfluous. Before invoking culture, we should thoroughly consider whether adaptations for altruistic punishment could have been individually fitness enhancing in ancestral environments.

There are several ways in which altruistic punishment could have benefited punisher fitness, five of which are discussed in Price (2003). Punishment, for example, might be regarded by observers as a costly signal of some underlying desirable quality (Gintis, Smith, & Bowles, 2001), such as commitment to group interests (Fessler & Haley, 2003), which could result in the punishing individual being a preferred partner in social interactions. Alternatively, punishment ability itself might be a desirable quality in a CA partner (at least to those who do not intend to free ride) because CAs involving effective punishers should tend to involve less free riding and to thus be relatively productive (Price, 2003). Finally, and most speculatively, genes for punishment may have evolved by a "greenbeard" process (Dawkins, 1976; Haig, 1996; Hamilton, 1964; Queller, Ponte, Bozzaro, & Strassmann, 2003; see Price, in press, for a discussion of CA from a greenbeard perspective), whereby engagement in the punishment of free riders was a reliable label of a gene for punitiveness. Such a gene may have produced resources preferentially for itself and thus promoted its own replication, by instructing CA participants to engage in reciprocal altruistic punishment according to the decision rule "punish free riders to the extent that you expect your average coparticipant to punish free riders."

4.2. Conclusion

If sentiments and behavior in CAs are products of a human nature specialized for cooperation, then they should be fundamentally similar cross culturally. The data presented above suggest that one kind of cooperativeness, punitive sentiment towards free riders, may meet this criterion. Future research could further investigate the degree to which this and other kinds of cooperativeness in CAs are similar cross culturally. If similarities are convincingly demonstrated, and seem most parsimoniously explained as functionally specialized aspects of human nature, then researchers will have the challenge of explaining how human nature came to be this way.

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