

Original Article

The cost of cowardice: punitive sentiments towards free riders in Turkana raids[☆]Sarah Mathew^{*}, Robert Boyd

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ARTICLE INFO

Article history:

Initial receipt 12 April 2013

Final revision received 3 October 2013

Keywords:

Public goods

Warfare

Pastoralists

Indirect reciprocity

Cooperation

Punishment

ABSTRACT

Models indicate that large-scale cooperation can be sustained by indirect reciprocity or direct punishment, but the relative importance of these mechanisms is unresolved. Unlike direct punishment, indirect sanctions can be meted out without cost to the sanctioner, but direct punishment is advantageous when the scale of cooperation exceeds the network size of individuals. It is of great interest to assess the importance of these mechanisms in small-scale acephalous groups in which people have lived for most of our evolutionary history. Here we evaluate sentiments towards free riders in combat among the Turkana, an acephalous nomadic pastoral society in East Africa who periodically mobilize for cattle-raids against neighboring ethnic groups. Using vignette studies, we probed participants' motivation to sanction fictitious warriors who were cowards or deserters in a raid and compared it respectively to their reactions to an unskilled warrior or a warrior who turns back due to illness. Our results indicate that the Turkana are motivated to impose both indirect and direct sanctions on cowards consistent with indirect reciprocity and punishment models of cooperation. Our findings imply that both these mechanisms have shaped human cooperative psychology, and sheds light on how prestate societies solve the collective action problem in warfare.

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1. Introduction

Informal mechanisms of social control are thought to play an important role in enabling large-scale human cooperation (Fehr, Fischbacher, & Gächter, 2002; Gintis, Bowles, Boyd, & Fehr, 2005; Henrich et al., 2004; Sigmund, 2007), but there remain three contentious issues. The first is the relative importance of direct punishment and indirect sanctions and rewards in maintaining cooperation. Indirect sanctions (Nowak & Sigmund, 1998; Panchanathan & Boyd, 2004) have the advantage that they can be imposed without cost to the sanctioner. In contrast, it is usually costly to implement direct punishment (Boyd, Gintis, Bowles, & Richerson, 2003; Brandt, Hauert, & Sigmund, 2006) and this creates a second-order free rider problem (Yamagishi, 1986). However, the information quality of reputational systems declines as the social group gets larger (Panchanathan & Boyd, 2003) making indirect reciprocity less efficient as the scale of cooperation increases (Henrich et al., 2010). Several factors can ameliorate the cost of meting out punishment—for example, collective coordinated punishment (Boyd, Gintis, & Bowles, 2010), rare implementation of punishment (Sethi & Somanathan, 1996), and centralized coercive institutions (Hooper, Kaplan, & Boone, 2010). Consistent with this reasoning, fines and imprisonment play a

crucial role in maintaining law and order in state societies, and sanctioning institutions with these properties emerged independently many times in the course of cultural evolution.

The second issue is what forms of sanctions are more efficient from a group functional perspective. In some experiments punishment induces cooperation but does not increase average group payoffs because both meting and receiving punishment are costly (Dreber, Rand, Fudenberg, & Nowak, 2008; Rand, Dreber, Ellingsen, Fudenberg, & Nowak, 2009). This has led researchers to argue that withholding help from defectors and rewarding cooperators are more plausible mechanisms than direct punishment for sustaining human cooperation (Dreber et al., 2008; Ohtsuki, Iwasa, & Nowak, 2009; Rand et al., 2009). However, laboratory experiments show that participants are motivated to punish free riders, and giving them the opportunity to do so can greatly increase the level of cooperation (Bernhard, Fischbacher, & Fehr, 2006; Fehr & Gächter, 2002; Gurerk, Irlenbusch, & Rockenbach, 2006; Henrich et al., 2006). The observations in Dreber et al. (2008) and Rand et al. (2009) that average group payoffs are lower when direct sanctioning occurs could be because the experiments limit interactions to 10 periods. With a longer time horizon of 50 periods, punishment leads to higher payoffs (Gächter, Renner, & Sefton, 2008). In an indirect reciprocity game with the option of punishment, (Ule, Schram, Riedl, & Cason, 2009), although only a small proportion of participants opted to punish rather than withhold help from a defector, their action had the crucial effect of causing defectors to have lower average payoffs than cooperators.

The third issue is whether there is sufficient evidence that sanctions play a role in maintaining cooperation outside of laboratory experiments. A recent paper (Guala, 2012) challenged the relevance of

[☆] This research was supported by National Science Foundation Doctoral Dissertation Improvement Grant BCS 0850816, a Leakey Foundation Research grant, an Owen Aldis award and a Harry Frank Guggenheim Dissertation fellowship, and Swedish Research Council Grant No. 2009–2390.

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punishment in supporting cooperation in field contexts saying, “...in spite of some often-repeated claims, there is no evidence that cooperation in the small egalitarian societies studied by anthropologists is enforced by means of costly punishment.” Consequently, Guala contends, it is premature to infer that laboratory experiments replicate mechanisms that support real-world cooperation. Some researchers have argued that Guala paints an overly pessimistic portrayal of the existing empirical evidence (Bowles, Boyd, Mathew, & Richerson, 2012; Casari, 2012). Nonetheless, it remains the case that there are not enough systematic field studies of punishment in small-scale societies to be sure that peer sanctions enable human cooperation.

Below we report results from a study of punitive sentiments towards free riders in combat among the Turkana (Gulliver, 1966; Little & Leslie, 1999; McCabe, 2004), a nomadic pastoral society in East Africa that sheds light on these issues. The Turkana are politically uncentralized, egalitarian, and lack economic specialization and centralized institutions of coercive authority. So peer sanctions and rewards are the mechanisms by which social order may actually be maintained. The Turkana periodically organize large-scale raids against neighboring ethnic groups to acquire cattle, and gain access to pasture and watering sites (Mathew & Boyd, 2011). These raids create a collective action problem. Raiding parties are large, involving up to few hundred warriors, most of whom are unrelated and are drawn from different territories, settlements and age-cohorts within Turkana society. Participants risk death—one percent of the combatants are killed on average on a raid. The primary benefit is the looted livestock, which can be had only if one goes on the raid. But on the battlefield warriors have many opportunities to reduce their personal contribution to the joint enterprise. They can keep their heads down, advance later than fellow combatants, escape when the enemy fire, retreat too early, and shift their efforts from fighting the enemy to acquiring a share of the loot. Therefore cowardice on the battlefield is a form of free riding. Furthermore, those who do not join the raid garner some of the benefits of victory such as enlarged territory and deterrence of future attacks. Therefore desertions from the raiding party are also a form of free riding.

We conducted two vignette studies designed to probe Turkana attitudes towards cowardice and desertion. First-hand accounts by participants in raids indicate that cowardice and desertions occur and are sometimes sanctioned either verbally or through corporal punishment and fines (Mathew & Boyd, 2011). But some questions about punitive sentiments are difficult to assess using interviews about actual raids. First, many factors besides the norm violator's behavior on a particular raid influence whether he will be punished: Is it the first time he did this? Was his life in immediate danger? Were other men doing the same? Is he an otherwise responsible herdsman? Second, indirect sanctions like loss of help, social support or mating opportunities cannot easily be measured because a warrior's reputation results from events over several years, not events during a single raid. The vignette studies address these limitations by investigating the effect of the act itself on the motivation to impose direct and indirect sanctions, holding constant idiosyncratic factors that affect a particular violator's chances of facing sanctions.

In each study, we compared people's reaction towards free riding to their reaction to a warrior who fails to contribute due to inability rather than effort. Experimental research has established that people care about the intentions behind selfish outcomes: they punish more harshly if a selfish outcome is due to a selfish intention than if the selfish outcome is unintended (Falk, Fehr, & Fischbacher, 2003, 2008). This motivation predicts that cowards or deserters should be treated more harshly than unable or ill warriors. In the cowardice study we compared a coward with an unskilled warrior. In the desertion study we compared a warrior who turns back due to fear with one who turns back due to illness. The results of the cowardice study are consistent with indirect reciprocity and direct punishment models of cooperation, and speak to how the Turkana solve the collective action problems created by raiding.

2. The Turkana

The Turkana are a nomadic pastoral society in northwest Kenya numbering approximately 800,000 people, subdivided into two-dozen territorial sections. They subsist on livestock products like milk, blood and meat obtained from cattle, camels, sheep and goats, and agricultural products that they obtain through trade (Gulliver, 1966; Little & Leslie, 1999; McCabe, 2004). Because rainfall is scant and unpredictable, they live year-round in temporary camps and relocate periodically to access fresh grass and water. A herdsman may settle anywhere in his own territorial section and can settle elsewhere in Turkana territory with permission from the hosts. Households make autonomous migration decisions, and so the composition of a settlement – the households that have set up camp together – is fluid. In the wet season, family members aggregate in settlements called *adakars*. In the dry season they separate into highly mobile cattle camps managed by young adults, and less mobile camps for the browsing stock where elders, married women and children reside. In the Kwatela territorial section where the study was conducted, dry-season wells and pastures are in the peripheral parts of the territory close to areas used by the Toposa and Dodoths pastoralists. When migrating to these areas, the Kwatela form dense settlements called *arigans* that are better for joint defense in the event of a raid by the Toposa or Dodoths. Turkana society is divided into alternating generation sets, *erisait* (leopard) and *emorut* (stone) (Lamphear, 1989). Additionally men are also subdivided into age-groups (Gulliver, 1958; Lamphear, 1976b). Age groups are a key organizing institution for men in contemporary north Turkana. Age mates sit together during feasts, stay near each other during raids, and herd together. Senior age groups have authority over juniors, and age-mates behave as equals. Patrilineal descent groups form clans. Clan members are geographically dispersed and are less important than age-based groupings when organizing for raids (Gulliver, 1958; Lamphear, 1989). Turkana society is politically uncentralized. Settlements have prominent warriors and diviners who act as leaders, but leaders are not vested with coercive authority. The community discusses violations and punishment is meted out by the violator's age-mates.

The Turkana periodically raid cattle from the settlements of neighboring pastoral communities. In the area where the study was conducted, raids are launched most often against the Toposa and the Dodoths. Warriors go either on small stealth missions to clandestinely take a few cows or in large armies of few hundred warriors that engage in a firefight and seize many cattle. In the past these raids were fought with spears (Lamphear, 1988), and for the last three decades they are fought using firearms that proliferated in the late 1970s to 1980s (Mburu, 2001). There is no professional warrior class and men are recruited informally to join a raid. The settlement initiating the raid sends word out to other settlements and over the course of the next few days warriors who intend to participate arrive. As they wait and plan their mission, they feast on animals speared for the occasion, join in the warrior dances, encourage each other, and receive blessings from the elders. Although commercial cattle raiding is on the rise in contemporary herding communities in East Africa (Mkutu, 2006), community-endorsed non-commercial raiding is typical in north Turkana where the fieldwork was conducted.

3. Methods

Participants are told a short hypothetical story in which a focal warrior fails to contribute to the combat effort. After they narrate the story back to us, they are asked a series of questions designed to elicit how they judge the act and whether they think the character should be directly or indirectly sanctioned. Each question had two parts: an open-response stage where participants could freely express their opinion, followed by a forced-choice stage in which they were prompted to pick

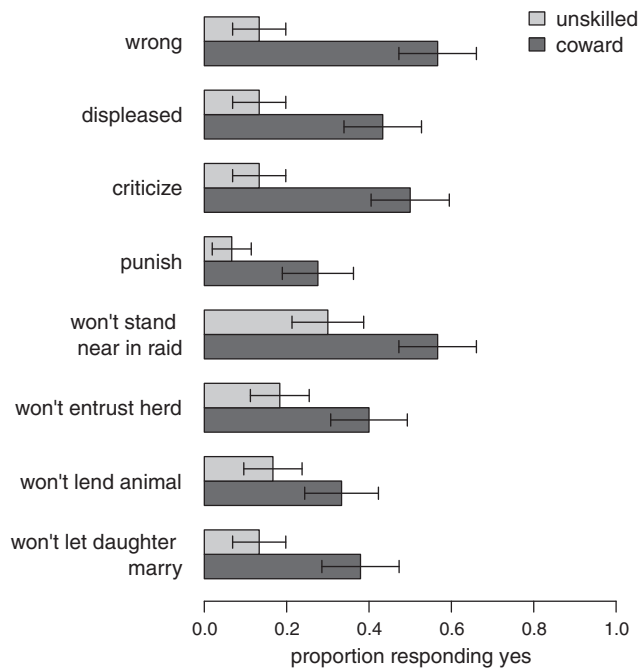


Fig. 1. Warrior-aged men's responses to a vignette describing a warrior who displayed either cowardice or lack of skill during combat. Bar lengths show the proportion of respondents who agreed with the proposition on the left. Each condition had 60 participants, 30 of whom heard the story of the coward before they heard about the unskilled warrior, and 30 of whom first heard the story of the unskilled warrior. Error bars show the 95% confidence interval. Responses were significantly different between conditions for all questions.

between two choices. The scenarios, questionnaire and details on how the study was administered are provided in the ESM.

In one study we compared participants' response to a warrior who fails to contribute either due to cowardice or due to lack of skill. Cowardice constitutes free riding, while failure to contribute that arises from lack of skill constitutes inability and should not elicit punitive sentiments. Sixty warrior-aged men were recruited for this study and each participant heard both scenarios. (We had each participant listen to both scenarios to reduce the number of subjects, because we needed to recruit a new set of warrior-aged male participants from the potential subject pool for other studies we were conducting.) Half the participants first heard the *cowardice* scenario and the other half first heard the *lack of skill* scenario. A follow-up study was done 16 months later with sixty married and unmarried women. Half of the unmarried and married women heard the *cowardice* scenario and the other half heard the *lack of skill* scenario.

In the second study we compared participants' response to a warrior who turns back from a raid either due to fear or due to an illness. Desertion due to fear constitutes free riding while turning back due to illness should be considered a misfortune that doesn't elicit punitive sentiments. Sixty warrior-aged men participated in this study. Thirty of them heard the *fear* scenario and the other half heard the *illness* scenario.

The scenarios and follow-up questions were culturally relevant, targeting prototypes of behavior that exist in Turkana discourse. Participants felt strongly about the scenarios presented and would often elaborately justify their judgment of the character. A selection of quotes extracted from the open-response of participants is presented in the Discussion section. Local Turkana research assistants translated these quotes from Turkana to English, and we edited the translations for grammar and style. For the warrior-aged men who heard both scenarios, we used paired *t*-test to compare their response in the *cowardice* and *lack of skill* condition. All other comparisons were done using unpaired *t*-test.

Some anthropologists have highlighted the role of prominent leaders and prophets in aiding large-scale collective action among East African pastoralists (Fratkin, 1979; Lamphear, 1976a). However, because leaders lack coercive authority in Turkana society, their presence cannot explain why warriors are motivated to bear a personal cost to fight courageously in a raid when they can obtain the same gains by lagging on the battlefield. Thus leaders help coordinate rather than enforce cooperation in present-day Turkana raids. Similarly, cultural institutions like age-groups (Baxter & Almagor, 1978) are important in organizing warfare in several East African pastoral societies. Such decentralized cultural institutions are likely to be built on people's dispositions to approve or disapprove of the actions of their peers. Thus our results may illuminate such institutions.

4. Results

Warrior-aged men, married women, and unmarried women all judged the coward more harshly than they judged the unskilled warrior, and participants thought that the coward should be subject to both direct and indirect sanctions. The proportion of warrior-aged male participants who expressed punitive sentiments was significantly higher for the coward (Mean \pm SE = .56 \pm 0.02) than for the unskilled warrior (Mean \pm SE = .13 \pm .02) condition (Paired *t* test: $t_{478} = 16.86$, $p < .001$). The proportion of unmarried female participants who expressed punitive sentiments was significantly higher for the coward (Mean \pm SE = .64 \pm .03) than the unskilled warrior (Mean \pm SE = .21 \pm .03) condition (*t* test: $t_{464.75} = 10.60$, $p < .001$). The proportion of married female participants who expressed punitive sentiments was significantly higher for the coward (Mean \pm SE = .43 \pm .03) than the unskilled warrior (Mean \pm SE = .16 \pm .02) condition (*t* test: $t_{433.58} = 6.95$, $p < .001$). In addition to the main effect, among warrior-aged males (Fig. 1) and unmarried females (Fig. 2), the effect of condition was significant for each of the questions. Thus, warrior aged men and unmarried women

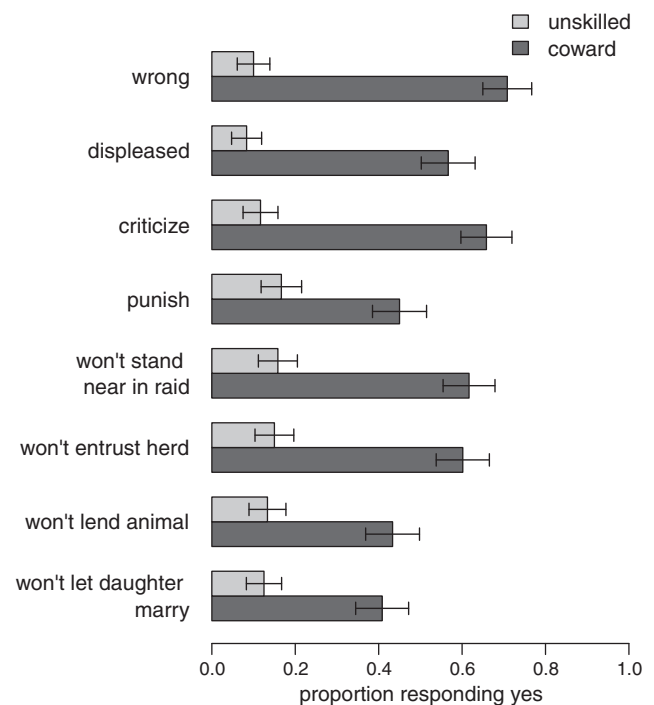


Fig. 2. Unmarried women's responses to a vignette describing a warrior who displayed either cowardice or lack of skill during combat. Bar lengths show the proportion of respondents who agreed with the proposition on the left. Each condition had 30 participants. Error bars show the 95% confidence interval. Responses were significantly different between conditions for all questions.

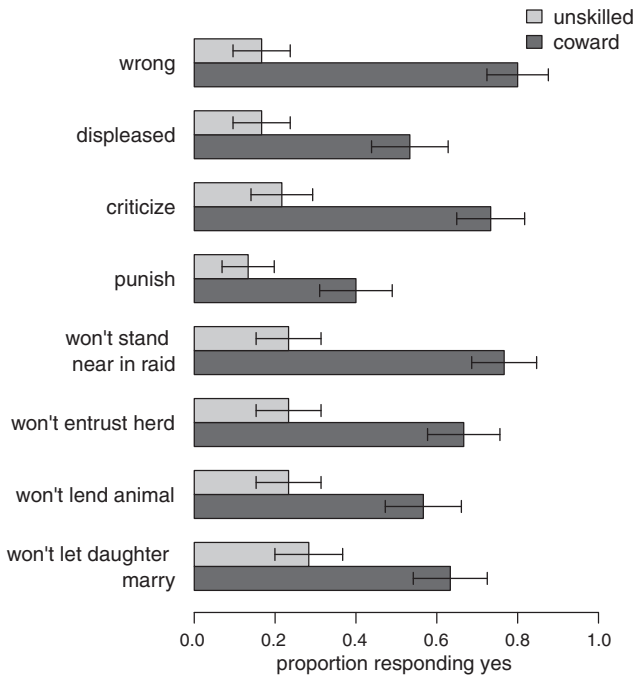


Fig. 3. Married women's responses to a vignette describing a warrior who displayed either cowardice or lack of skill during combat. Bar lengths show the proportion of respondents who agreed with the proposition on the left. Each condition had 30 participants. Error bars show the 95% confidence interval. Responses were significantly different between conditions for all questions except "entrust" and "lend".

were significantly more likely in the cowardice condition to: judge the act as wrong, be displeased by the warrior's behavior, expect him to be criticized, feel that he should be punished, refuse to stand beside him in a raid, refuse to entrust their herds with him, refuse to lend him a goat if he needed one, and refuse to let their daughter marry him. Unmarried women's responses (Fig. 3) were significantly different for all questions except for refusing to entrust their herd ($p = .06$) and refusing to lend an animal ($p = .14$) for which the trends were in the predicted direction.

We did not find a similar consistent effect in the desertion study. A significantly higher proportion of participants responded punitively in the fear condition (Mean \pm SE = $.34 \pm .03$) than in the illness (Mean \pm SE = $.23 \pm .03$) condition (t test: $t_{470,56} = 2.91, p < .01$). However, this was due to how participants responded to two of the eight questions. Participants were significantly more likely to judge desertion from fear to be wrong, and expect the fearful deserter to be criticized, but there were no significant differences in their motivation to punish and impose indirect sanctions, with no consistent trend in the predicted direction (Fig. 4).

For the warrior-aged men in the cowardice study (all of whom heard both scenarios) the order in which participants heard the scenarios affected their response. Punitive reaction in the cowardice condition was significantly higher (t test: $t_{476,76} = 3.80, p < 0.001$) among participants who heard the cowardice scenario second (Mean \pm SE = $.64 \pm .03$) than those who heard it first (Mean \pm SE = $.47 \pm .03$). There were no order effects for the unskilled warrior scenario. The magnitude of the order effect was small, so that whether participants heard about the coward first or second, they responded more punitively towards the coward than the unskilled warrior (ESM Fig. S1, available on the journal's website at www.ehbonline.org).

Unmarried women were more likely to express punitive sentiments than any other demographic category (ESM Fig. S2, available on the journal's website at www.ehbonline.org). Unmarried women were more likely to respond punitively towards the coward than warrior-aged males (t test: $t_{477,59} = 3.75, p < .001$). Unmarried women were also more likely to respond punitively towards the

coward than married women (t test: $t_{475,12} = 4.58, p < .001$). For the unskilled warrior scenario, there was a trend, with men expressing the least punitive sentiments, followed by married women, followed by unmarried women, and the difference is significant between men and unmarried women (t test: $t_{445,2} = 3.18, p < .01$).

5. Discussion

5.1. Judgment of the coward as a free rider

Although both cowardice and lack of skill decrease a warrior's contribution to the combat effort, participants were much more likely to think that what the coward did was wrong and be displeased by his action. Participants condemned the coward's behavior as free riding, which is consistent with the view that there is a collective action problem in offensive raids. They described the character (he is named Emuria in the vignette) as someone who gains from the effort of others: "What Emuria did was bad, because, why did he retreat when the rest were going for animals, with the intention that he will get the animals when the rest are driving them to Turkana? He wanted to save himself when the rest are going towards death." They describe him as someone who takes away from the success of a joint enterprise: "It is bad because when people decide to go and raid the enemies, they have to be united and there is no use for one to remain behind. It is good that all fight together." They describe him as someone who does not protect other men during the firefight: "What Emuria did in that raid was very bad. Because, if the situation would have worsened, Emuria would have not saved the people. He would have left his brother and others there." They describe his action as one that does not benefit the community: "It is bad for us all because there is hunger in the land. You decide to go and look for animals because there is no food, and reaching there, you fear. And yet you know there is nothing that your people are eating and it is good to look for food." In contrast several participants approved of the unskilled warrior (named Lokai) citing that he at least fought: "It is right because he fought, he fought, he fought. It is right. The only

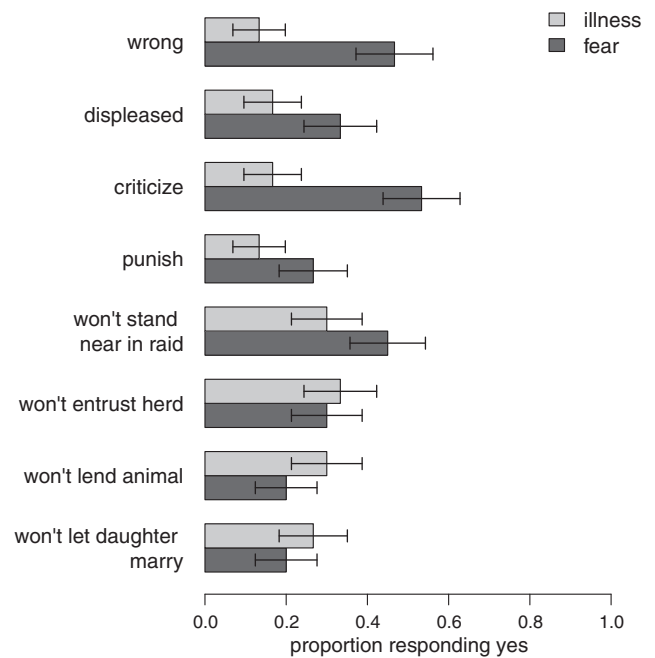


Fig. 4. Warrior aged men's responses to a vignette describing a warrior who turned back along the way either due to fear or due to illness. Bar lengths show the proportion of respondents who agreed with the proposition on the left. Each condition had 30 participants. Error bars show the 95% confidence interval. Responses were not significantly different between conditions except for "wrong" and "criticize".

problem was that he was not a sharp shooter. Lokai's issue is not like that of Emuria."

5.2. Direct punishment: corporal sanctioning and criticism of the coward

Participants told the story of the coward felt that he should be criticized and punished. These punitive motivations are consistent with direct punishment models of cooperation.

Punishment entails being beaten by a group of age mates after which the violator kills one of his animals for the others to eat. Punishment of cowards is administered discreetly. In the words of one participant: "His age mates are the ones to do that by beating him and criticizing him, not around the homesteads, but at the bush." A violator's age-mates may encounter him when he is alone in the grazing field and cannot easily escape. They pin him down or tie him up, and then beat or whip him.

Participants said the goal of corporal punishment is to cause the coward to change his behavior in the future: "He will be beaten, we will beat Emuria and he has also to kill animals, and next time we bring him to the raid if he repeats the same, we will once more beat him." In the course of punishing the coward, his age mates reprimand him for what he did: "They will beat him and ask him: 'Why did you leave the cows and yet the enemies have taken ours? Why did you leave them? What do you expect to eat when you are back?'" They school him about how he should have behaved and caution him to not repeat the mistake: "They will teach him saying: 'Why did you fear like this and yet we were all there? Why didn't you wait, and if you see us running then you do the same? Why did you run away before we decided to do that? Do not repeat that again.'" Reproaches and corporal sanctions like these they hope will spur the coward to conform to their expectations. As one participant reasoned: "To teach him is to beat him, not just talk to him. The only way for him to change is by beating him, having him kill the animals and be blessed. But to just talk to him is not enough. Because, it is when he feels the pain that he will have regrets that my people have cursed me and I need to seek reconciliation by smearing my body with chyme. If not he will remain like an odorous thing."

While criticism does not impose a cost on the violator, it seems to be a key first step. Through criticism a violator may be made aware of his mistake: "Even when he comes to someone's home, they will quarrel with him saying, 'you who returned back when the rest go for cows!'" It may allow people to express the cause of their anger and signal to the violator how their relationship may change: "I will tell him: 'There's no relation between us. If I had been killed there, whom would you have talked to, because you did not rescue me from death? What is the need for you to come to me? What things are you bringing? Go! I do not want you! Save yourself the way you did!'" Criticism may also give the violator a chance to justify his behavior: "I will ask him if I happen to meet him at my home place: 'I heard you ran away when you went to raid the enemies?'" It may also allow other people to defend a violator from the accusations. As one participant described: "Courageous and brave hearts will criticize him saying: 'Look at this weakling that dies alone before he is even touched.' Others with the nature of cowardice like Emuria will support him saying: 'what did you want Emuria to stand for? Death that has ripped many people? Leave him alone.'"

Before punishment is initiated, community members converse about the coward among themselves, a kind of informal adjudication process. Men may discuss the issue in their gatherings: "People will talk at the tree of men saying: 'What allowed the enemies to recover the cows we got was Emuria. What can we do to this guy?'" Differing opinions may get voiced: "I will tell them that Emuria did something bad and I will ask, 'gentlemen, are you happy about this?' Some will say, 'we approve' and others will say, 'we do not'". Women may air their sentiments when they happen to see his age mates: "I will tell them: 'One of your age mates has done something wrong.'" Some women's enquiries may spur his age mates to take action: "I will tell them: 'Emuria went to raid with other men and they feasted on a goat before

departure. When they reached there and it was time to attack, Emuria feared and started hiding behind the others and failed even to fire his gun. Now regarding this issue, what do you people think should be done to Emuria?'" Other conversations may dissuade his age mates from beating the coward: "I will tell them: 'someone called Emuria has committed a mistake by not following the rules of the raiding party. Talk to that guy to quit what he is doing maybe because of his fear. It is better to talk than to beat him'"

5.3. Indirect sanctions: terminating beneficial social exchange with the coward

Participants were more inclined to deny a coward the benefits of social exchange than someone who has not committed such a violation. These sentiments are consistent with indirect reciprocity models like in Panchanathan and Boyd (2004) and Milinski, Semmann, and Krambeck (2002), where free riders in collective action are excluded from the benefits of pairwise social exchange. The potential economic consequences for the coward are serious.

Participants were less inclined to stand beside a coward than an unskilled warrior during a raid. As one participant responded: "I will not be next to him because he is a coward. If the enemies surround me and him, he will run away and leave me there. I will remain there fighting with the intention of defeating the enemies. The enemies will kill me there, that is why I will not be next to him. I will always want to be next to a man who is courageous and brave so that in case of anything we will be rescuing each other, like if my bullets finish I will ask him for his." Warriors rely on their combat neighbors to cover them during the fire fight, to lend them bullets, share water with them, rescue them from the combat scene when they are injured, and help them drive their share of the loot. Having combat neighbors who feel less obliged to offer such support could be consequential.

Participants were also less inclined to entrust their herd to a coward than to an unskilled warrior. As one participant said: "I will not trust him. If I do, then I know I have just thrown away those animals because I know I have not entrusted them to anyone. It is good to entrust the animals to a courageous person who can take the animals to the pastures and when the enemies attack, he fights with them and recovers the animals. But as for Emuria, he is a coward." A young Turkana man's day is primarily spent in herding duties. In the course of a day, cattle need to be moved to new grazing areas and walked several kilometers to watering holes before they are returned home at dusk. All the while herdsman need to be vigilant and ready to defend their animals as many raids occur during the day in the grazing fields. They are expected to provide reinforcement when herdsman in nearby pastures are attacked. But a herder may need to excuse himself from these duties from time to time in order to travel to other settlements to visit relatives and friends or to court women. He may need to visit town to buy tobacco and maize and visit settled relatives. When men go raiding herders entrust their livestock to men they believe will graze and water the animals with diligence and defend them in case of a raid. It is easiest when their fathers have many sons, and so a brother or stepbrother can take over. Otherwise, men rely on cousins, friends and age-mates that they have informal turn-taking arrangements with.

Participants were less inclined to lend an animal to a needy coward. In the words of one participant: "I will not give because how can I give to a cowardly person who takes care of his body. It is good I give to a trustworthy person that I know will fight with the enemies in case of any attack and die with the enemies. But in his case, he is an enemy because of being a coward." Herdsman may need to borrow an animal when they do not have the appropriate stock animal at hand to kill for its meat, to offer for a feast, or to follow a diviner's instructions for healing. Furthermore, livestock epidemics, famines and raids sporadically deplete a family's herd. At such times a herdsman calls on his relatives, community members, friends and age mates to give him

animals so he can rebuild his herds. Even though households take care to spread their risk by distributing their stock in different locations, donations from one's social support network are essential for recovery from these catastrophes. Some families never recover from these events and are forced out of the pastoral sector. They settle permanently in towns, have poorer health and nutrition than their nomadic counterparts, and are forced to rely primarily on relief food.

Participants were less inclined to agree to marry or give their daughters in marriage to a coward than an unskilled warrior. As one participant said: *"I will not accept because when the enemies surround his homestead, how will my daughter save herself or how will he save her? He will run away to save himself and the rest of the people will be killed. Where will I start over? I will refuse all his animals and let him eat by himself."* Families obtain substantial wealth through bride price when their daughters marry, and several participants acknowledge that to turn away a man who comes in marriage is to turn away wealth. Nonetheless, participants declined a coward citing that he would fail to defend his family and wealth, more often than they declined an unskilled warrior who presumably has similar inadequacies. In a polygynous marriage system like in Turkana society where some men may never get to marry, reluctance to take a coward as a husband can potentially have grave consequences for a man perceived to be cowardly.

5.4. Alternate explanation: avoiding undesirable social partners

An alternate explanation to indirect reciprocity is that cowards lose social partners because people make inferences about the coward from his actions and they use it to avoid inferior interaction partners. It may be worse to stand near a coward in combat, or to entrust your herd or daughter to a coward than an unskilled warrior. A coward may be seen as a weak, irresponsible person with little self control, while the unskilled warrior as someone who only lacks in fighting skill but is otherwise predictable. It is less obvious why participants would refuse to lend the coward an animal—an interaction not directly affected by cowardice. One possibility is that people think that if a person violates a norm in one domain, he may do so in other domains too. As one participant said: *"I will not give him, I know that he is a liar and he will not pay it later."* Nonetheless, if choosing desirable social partners and not norms against free riders was the motivation for people's response, it begs the question why men and unmarried women do not also refuse to entrust their lives, herds and daughter to an unskilled warrior.

5.5. Alternate explanation: choosing desirable mates

The fact that unmarried women were more inclined to be critical of the cowards suggests that it is the need to choose good mates, not punitive sentiments that underlie people's reaction towards cowards. Unmarried women were not just reluctant to marry the coward. They were also more likely than other participants to judge the act as wrong, be displeased by the warrior, want him to be criticized and punished. More so than warrior-aged men who were asked about themselves, and married women who were asked about their husbands, unmarried women did not want their fathers to stand next to the coward during a raid, entrust their herds to him or lend him an animal. Mate choice concerns choosing desirable partners, not administering direct or indirect sanctions. However, the search for a suitable long-term partner could make young women more discriminating about men's character and their adherence to norms and social values. This may spill over and cause them to have heightened punitive sentiments more generally.

5.6. Desertion

Participants were not consistently more punitive towards the fearful deserter than towards the unwell deserter. It may be that illness is

frequently the pretense under which warriors desert, and so the information given in the vignette was not sufficient to override their prior assumptions about the character's motive. Consistent with this, some participants want to impose indirect sanctions on the unwell deserter. While people may be unwilling to directly sanction him because of the explicit but unverifiable claim of illness, they may have a negative impression of such a person – as not just a free rider, but also one who is lying – that motivates indirect sanctions. Another possibility is that people are more polarized about whether desertion constitutes a norm violation or not. If the main benefit gained is the loot, then desertions are less damaging to the joint enterprise than cowardice on the battlefield, because deserters do not partake in the spoils.

6. Conclusion

Participants were motivated to sanction cowardice in combat through direct and indirect sanctions suggesting that both forms of sanctions play a role in sustaining large-scale cooperation. While this study focused on indirect sanctions (or indirect rewards) and direct sanctions, direct rewards can also be important especially for rare acts like bravery and self-sacrifice in combat. Such rewards should be investigated.

Our results when taken together with existing laboratory experiments provide a compelling case for the role of other-regarding punitive sentiments in fueling human cooperation. It is unlikely that selfish motives drive the punitive sentiments elicited in our study. First, participants in the vignette study themselves were unaffected third parties. They feel these punitive sentiments towards a warrior who inflicted harm on some other Turkana warriors who were once out on a raid. But even if participants responded as if they were on the raid themselves, self-interested explanations do not fit our results. Turkana raiding parties are large, numbering several hundred warriors drawn from a wide swathe of social groupings. Because the benefit of sanctioning a coward can be obtained even by warriors who do not participate in punishment, punishing misbehavior in large raids is itself a public good. But suppose that even in a large raid, one's immediate neighbors on the battlefield have such a large effect on a warrior's survival chance that it is worthwhile to punish them when they are cowards. Here the laboratory experiments that carefully controls for selfish motivations support the interpretation that the punitive sentiments we observe stem from other-regarding motives. In third-party punishment games, third party observers – who we can be certain have nothing to gain from punishing – are motivated to sanction donors who make low offers to recipients (Bernhard et al., 2006; Fehr & Fischbacher, 2004; Henrich et al., 2006). In public goods games where group composition changes each round – ensuring that individuals will not gain from punishing – participants punish low contributors (Fehr & Gächter, 2000, 2002). In an indirect reciprocity game some participants choose to punish individuals who have not helped someone other than the participant in previous rounds, and most participants at least withhold helping these defectors (Ule et al., 2009). Our study shows that in a novel ethnographic context where high-stakes large-scale cooperation in warfare occurs, participants express punitive motives that are consistent with these experimental findings.

Our results suggest how politically decentralized societies may be solving the collective action problem in warfare. Anthropological research has paid little attention to the collective action problem in warfare, and instead focused on the direct material benefits that individuals or societies derive from warfare (Chagnon, 1992) and what explains the prevalence of warfare cross-culturally (Ember & Ember, 1992; Keeley, 1996; Kelly, 2000). The ensuing debates have demonstrated that warfare occurs in many types of social systems, and that the direct benefits derived from warfare vary (e.g. women, status, territorial expansion, cattle, subjugation and tribute, property rights, deterrence, political rights and civil liberties), and depend on the cultural context (Keeley, 1996; Otterbein, 1985). The prevalence

of warfare implies that many societies, even politically uncentralized ones, are able to solve the collective action problems in warfare, but it is unclear how. Patton's study among Achuar warriors (Patton, 2000) posited that reciprocal altruism motivates warrior's participation. Such reciprocity may motivate cooperation in small-scale warfare, but it doesn't fully explain participation in warfare when raiding parties are comprised of people from different villages, clans and communities who don't regularly interact.

Our findings raise the question, why are punitive motivations based on both indirect reciprocity and direct punishment mechanisms? One possibility is that human cooperation occurs in a variety of domains and ecologies in which these distinct mechanisms have been separately favored. Another possibility is that the scale of human cooperation has increased over the last several thousand years. Indirect reciprocity may have initially been the primary mechanism because it works well in smaller social groups and can be implemented without costing the sanctioner. Over time, processes like cultural group selection could have favored the more costly direct sanctioning as the scale of social organization increased and informal institutional solutions emerged to ameliorate the costs associated with meting direct sanctions. A third possibility is that some feature of humans – language, between-group variation from social learning processes, a life history trajectory where the benefits of cooperation were exceptionally high – could have opened the door to a variety of mechanisms for sustaining cooperation. Under this scenario we should expect to see multiple mechanisms in addition to indirect reciprocity and direct sanctioning that sustain cooperation. For instance, costly signaling mechanisms should support more group-beneficial outcomes in humans compared to other animals; direct reciprocity should be elaborately developed in humans; internalization of norms should lead to prosocial preferences that result in cooperation. While it is necessary to evaluate the evidence for indirect sanctions and rewards and direct punishment in maintaining cooperation, a key puzzle is why a variety of mechanisms enabling cooperation evolved in humans but not in other animals.

Supplementary Materials

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.evolhumbehav.2013.10.001>.

Acknowledgments

We thank H. Clark Barrett, Daniel Fessler, Joseph Manson, Cristina Moya, Karthik Panchanathan and Joan Silk for their comments in earlier stages of this research. We also thank two anonymous reviewers for helpful comments.

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