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# The moral consequences of social selection

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**Abstract**
For half a century explaining human altruism has been a major research focus for scholars in a wide variety of disciplines, yet answers are still sought. Here, paradigms like reciprocal altruism, mutualism, and group selection are set aside, to examine the effects of social selection as an under-explored model. To complement Alexander's reputational-selection model, I introduce group punishment as another type of social selection that could have impacted substantially on the development of today's human nature, and on our potential for behaving altruistically. Capital punishment is a decisive type of social selection, which in our past hunter–gatherer environment was aimed primarily against intimidating, selfish bullies, so it is proposed that moral sanctioning has played a major part in genetically shaping our social and political behaviours. Aggressive suppression of free-riding deviants who bully or deceive has made a cooperatively generous, egalitarian band life efficient for humans, even as it has helped our species to evolve in directions that favour altruism.

**Keywords**
moral evolution, social sanctioning, hunter–gatherers, chimpanzees, bonobos.

## 1. Introduction

Today hunter–gatherers may ask mythologically how people could have 'evolved' from a nonmoral animal into a moral one, so raising such issues of provenance goes back at least to the beginning of cultural modernity. This means that the question of 'moral origins' has been on human minds far longer than we have had scholars or ecclesiasts writing about such matters. Unfortunately, since Darwin the term has acquired such a confusingly wide range of meanings that if a given study involves questions of right and wrong, and if it looks to both biology and morality, it is likely to qualify —


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for example, Ridley's (1996) *The Origin of Virtue*, which is basically about sociobiological models.

Here, drawing directly from Darwin's (1871) work on sexual selection, I consider altruism's evolution strictly in terms of biocultural evolutionary mechanisms as these work over time. My special interest will be in social selection (e.g., West-Eberhard, 1975, 1983; see also Alexander, 1974, 1987; Simon, 1990; Parker, 1998; Nesse, 2007; Boehm, 2008, 2012b; Hrdy, 2009), defined as genetic selection that is accomplished by the social, as opposed to the natural environment.

We will be focusing on the genetic consequences of behaviours found today, by which reproductive success is helped or hindered by how ethically a person behaves in a group context. More specifically, we are interested in the group social control of humans, which has served as a selection force that favors the evolution of altruism, and specifically in the ways that economically-independent mobile hunter–gatherers control their own behaviour so as to avoid costly group disapproval or punishment.

## 2. How does punitive social selection favor altruism?

Alexander (1987) concluded that altruistic cooperation does not follow Trivers' (1971) very popular, well-balanced, dyadic reciprocal-altruism model. What nomadic foragers actually do, is to assume that if you help someone in dire need in the same band today, then in the future other people, those in whatever band you are living in by then, will help you even though you never helped them. Such indirect reciprocity applies to reproductively important matters like sharing meat or seeing to it that safety nets work, and, because demographically-flexible hunting bands are composed mainly of nonkin (Hill et al., 2011), altruistic contributions are essential.

In everyday hunter–gatherer conversations people's social reputations are a major and favorite subject in gossiping (Wiessner, 2005), and having a good reputation as an altruist can pay off with respect to fitness. Alexander emphasizes marital choices, which favor attractive reputational qualities such as being altruistically generous. Or, in a safety-net context, consider Ecuador's Aché foragers. If a household head becomes sick or injured, more emergency help will be forthcoming for those known to have generously helped others in the past, especially if the cost of helping was high, than for those known to have been well-off but routinely stingy (Gurven, 2004).

Because people favor altruists in choosing marriage or foraging partners, this means that often altruists will be pairing up with other altruists (Wilson & Dugatkin, 1997), and such assortative partnering favors the genes of these more generous cooperators. This is because they will reproductively outcompete other pairs that are less altruistic, and this makes reputational selection quite potent. This model of Alexander's provides a broader conceptualization than costly signaling (Bird et al., 2001), for the reputational signals need not be costly and the personal qualities being weighed by individuals in partner choice can be negative, even though Alexander emphasizes positive qualities.

Here I broaden the scope of social selection by focusing on certain controversial individuals, those prone to act selfishly as bullies, thieves, or cheaters, and by bringing in moralistic group sanctioning (Boehm, 1997). Not only will such free-riders tend to rate poorly when it comes to partner choice, but entire hunting bands will be applying collective social control against them aggressively, in ways that can affect fitness drastically — unless they control themselves. In foraging bands, the ultimate sanction is capital punishment, and the agency of self-control is the conscience.

## 3. How sanctions led to conscience

Conscience has many meanings, but here I discuss our evolutionary conscience, which Alexander (1987) defined purely in terms of reproductive success. Thus a conscience provides an individual with feedback that helps in staying out of trouble with the group, which means adhering to group rules — except when one will profit by breaking them. In this sense, I will be using the term technically to describe the operation of personal self-assessment and self-control in the face of predictable social reactions that punish deviance (Boehm, 2012b).

Conscience functions have some physical correlates: they are partly localized in the prefrontal cortex (Damasio et al., 1990) and they seem to depend on the paralimbic system (Kiehl, 2008) for critical emotional connections that bring empathy into play. While these brain areas and many of the associated functions are far from unique to humans, responses like blushing socially, feeling shame, and morally internalizing group values such as those which favor generosity seem to be ours alone.

Human capacities for empathy that lead to altruism are associated with taking the perspective of others and being moral (Flack & de Waal, 2000),

and hunter–gatherers actively promote such altruism. Today, the paradigms best suited for explaining the resulting generous behaviour appear to be mutualism; social selection; and possibly multilevel or group selection. As a distinctively human type of social selection, group punishment brings in a special dimension, and in fact hunter–gatherers of the 'Late-Pleistocene appropriate' type often act as aggressive, moralistic groups to curb, reform, or eliminate serious deviants (Boehm, 1997). Punishers' costs are very low while the deviant can lose fitness radically, so people acting as punitive groups can be quite impactful in helping (inadvertently) to shape their own gene pools.

## 4. Deep political background

Three living species are descended from Ancestral *Pan*, and living in social dominance hierarchies is a major feature of our evolutionary past (Wrangham, 1987; Wrangham & Peterson, 1996). If we look for antihierarchical coalitions it is apparent that today humans are prepared to crack down on bullies far more definitively than are chimpanzees or bonobos (Boehm, 2012b), so we have taken our own evolutionary course. This is because with humans sanctioning by groups can be fiercely moralized, and because hunters carry lethal weapons.

As bonobo males compete for rank, basically they team up only with their mothers. However, females do routinely form small coalitions with other females in situations of feeding competition, so they can compete strongly when facing off against individual males (Kano, 1992). Rarely, bonobo coalitions can grow larger and fierce; if a male is seriously bullying a female, he can be severely attacked and wounded (Hohmann & Fruth, 2011). This rare large-group response is reminiscent of group social control in humans.

Chimpanzees form coalitions in a wider variety of contexts, including dyadic male partnerships that routinely try to unseat the alpha (de Waal, 1982), and larger, sometimes mixed coalitions that occasionally eject a high-ranking male from the group or kill him (Boehm, 2012a). In captivity, female coalitions ride herd on the alpha male and prevent unwanted male bullying (de Waal, 1990), while in the wild mostly-male raiding coalitions go after outnumbered strangers in no man's land (e.g., Goodall, 1986), and bisexual coalitions may threaten predators like leopards (Byrne & Byrne, 1988) or pythons (Boehm, 1991).

Similar coalitions are found in humans (Boehm, 1999), but in mobile band societies the earmarks of social hierarchy have been removed to such a substantial degree that anthropologists call them egalitarian. Humans cooperate as entire bands when it comes to safety nets, or meat distributions, or in sanctioning deviants, and people also unite as coalitions against natural predators. Human foragers may also gang up to go raiding against neighbors or rarely to engage in intensive warfare, and we also engage in group rituals. Our reputation for collaboration is deserved, and a generally less recognized type of cooperation is the moralistic group sanctioning I am emphasizing. This cultural activity is crucial if egalitarianism is to stay in place, and also if groups are to cooperate effectively.

In assessing antihierarchical alliances in Ancestral *Pan* as of 5–7 million years ago, the least common denominator has to be chimpanzees and bonobos because they have not "moralized" their collective efforts in aggressively controlling overbearing individuals who offend them. Nor do these apes do more than mitigate the hierarchical tendencies that humans in small bands are able to reduce so drastically. Thus, with morality's help Late-Pleistocene humans achieved a long-term state of political egalitarianism that heavily neutralized alpha power (Boehm, 2012b), and therefore they were able to share coveted large game on an equalized basis (e.g., Wiessner, 1996). Social control was their instrument, and a large brain surely was critical in developing a moral worldview (ethos) that enabled humans to reshape society so *definitively* in favor of individual autonomy.

## 5. An opportunistic evolutionary conscience

By philosophical common sense we think of the conscience as a set of psychological functions that ennoble our social activities by attuning us to behave ethically, following the norms of our group. However, I have referred to a more neutral scientific view, introduced by Alexander (1987), which simply takes the conscience to be an evolved psychological mechanism that looks to maximize our reproductive success.

Thus a conscience not only tells us to behave ourselves; it advises us to cheat on the system a little — as long as a net personal benefit seems likely. Basically, Alexander talks about a small voice that tells us to do things that assist our fitness, and anyone but a psychopath (Hare, 1993) will experience major conscience functions that hook us up with emotions such as shame or remorse, and can lead both to self-control and to personal reform.

It is our blushing internalized sense of shame, combined with fear of the group's capacity to pressure and punish, that keeps most of us humans reasonably well in line with group mores. In contrast, a chimpanzee or bonobo is ruled simply by fear of external domination or punishment.

## 6. Capital punishment as a moral indicator

Once humans became moral the intensity of the group punishments they employed could stand as a measure of how deeply a given antisocial behaviour was deeply disturbing to group members, or seen as damaging. Capital punishment was the ultimate measure, and here, setting aside other potent sanctioning measures like ostracism or shaming, we will examine such punishment among mobile foragers in some detail. This involves a survey of 50 pure hunter–gatherer societies, all of a type likely to have predominated during the late Pleistocene.

Table 1 shows the individual actions that provoked a moralistic group killing, and almost half of these societies did report incidences of this. By far

**Table 1.**
Capital punishment in 50 Pleistocene-type foraging societies (from Boehm, 2012b).

| Type of deviance | Specific deviance | Societies reporting |
|---|---|---|
| Intimidation of group (21 reports) | Intimidation by malicious sorcery | 11 |
| | Repeated murder | 5 |
| | Action otherwise as tyrant | 3 |
| | Psychotic aggression | 2 |
| Sexual transgression (6 reports) | Incest | 3 |
| | Adultery | 2 |
| | Premarital sex | 1 |
| Taboo violation (5 reports) | Endangers group by violating taboo | 5 |
| Cunning deviance (2 reports) | Theft | 1 |
| | Cheating (meat-sharing context) | 1 |
| Miscellaneous (4 reports) | Betray group to outsiders | 2 |
| | 'Serious' or 'shocking' transgression | 2 |
| Deviance unspecified (7 reports) | | 7 |
| Reports of capital punishment | | 45 |
| Societies reporting capital punishment | | 24 |

the most frequent deviance was intimidating others either through physical or supernatural power.

### 6.1. *Killing of bullies*

It is clear that hunter–gatherer populations are likely to produce occasional individuals who simply will not heed the egalitarian moral strictures of their groups to behave with humility (e.g., Lee, 1979), or at least to avoid seriously overbearing behaviour that threatens others physically or supernaturally. A moderate bully can be 'put in his place' nonlethally (Boehm, 2012b) — at least, if his conscience allows him to reform. However, a really serious and determined intimidator will have to be liquidated, and Table 1 shows 21 instances of such executions, with some societies being responsible for more than one instance.

Thus, even in using what amounts to a typical limited modern ethnographic time-sample that basically covers just a century or so, and with ethnographies that by their nature are far from complete, nearly half of these societies report killing such a deviant. If our time-sample were a generous 10 millennia instead of a mere century or so, my prediction is that capital punishment of bullies would be found in every society of mobile hunter–gatherers.

There are six incidences of execution for sex crimes, but it is worth noting that some forager societies take premarital intercourse or adultery quite lightly, while even incest is not considered a really serious offense everywhere. There are also five instances of individuals being killed because they violated serious taboos and thereby endangered the entire group, but the main capital crime is acting the bully.

Being egalitarian, all of these societies dislike bullies intensely, and serious upstarts are widely curbed by bands using both lethal and nonlethal sanctions. Consequently, ever since lethal moralistic sanctioning became effective, at the level of phenotype surely our styles of bullying have been constrained by strong social-selection pressures. These same pressures could have been otherwise modifying our basic political nature in important and consistent ways.

### 6.2. *What about cheating free-riders?*

It would appear from Table 1 that deviants who *deceive* have been severely punished much less frequently. However, if we consider such deceptive free-riding in the context of lesser sanctions, such as ostracism or shaming, in

a subsample of 10 societies I found that in all of them, as a predatory deceptive practice *theft* is noted as being punishable. To a lesser degree this also was true of cheating and lying, but this held only in about half of this smaller sample (Boehm, 2012b). Thus theft appears to be the main deceptive behavior that brings punishment.

Obviously, capital punishment is potent as a selection agency because it curtails reproduction so directly. The earlier in life it happens the greater the curtailment, and it also will prevent the deceased from supporting his offspring or his offspring's offspring later in life. Ostracism and shaming merely diminish positive social contact and remove deviants from cooperation networks, so as mechanisms of social selection they have less severe effects — but they do take place much more frequently. In combination, with respect to the evolution of altruistic traits all these hostile sanctions seem to be focused primarily on bullying and secondarily on theft, while individuals are left more on their own to defend against face-to-face cheaters simply by avoiding them.

## 7. A specific timeline

By taking the origins aspect of 'moral origins' literally, we can develop some core diachronic hypotheses about how morality could have evolved. These may be useful in informing future studies in this area, including those by biologists, evolutionary psychologists, zoologists, anthropologists, philosophers, and economists. An obvious starting place is an evolutionary timeline.

### *7.1. Primitive building blocks 5–7 mya*

Ancestrally, we had in place empathetic perspective-taking and self-recognition, along with some ability to form political coalitions that united subordinates against individuals whose applications of power were particularly resented. Also in Ancestral *Pan*, we had a group-living ape that could cooperate politically and in sharing its small game (Boehm, 2012b).

### *7.2. Early hominims*

Briefly, in Africa between 4 and 2 million years ago a variety of small-brained terrestrial apes were evolving, but despite constant debate I believe there is no compelling reason to include any one of the fossils discovered so far in the direct human line of descent. This might apply even to *Homo habilis* (see Klein, 1999).

### 7.3. A large-game scavenger emerges

1.8 million years ago or more, a tall, angular, and much larger-brained early human evolved, and within a few hundred thousand years this first certain *Homo* was fashioning Acheulian hand axes (Klein, 1999). *Homo erectus* seems to have been power-scavenging large game occasionally and probably sometimes quite actively, by ganging up aggressively to drive big cats off of their large kills (Klein, 1999).

Those occasional large carcasses surely would have been shared — most likely with intimidating alpha males exhibiting some decisive priority. However, the scavenged carcasses often were enormous — and in Africa they would not keep. This meant that once a group had bluffed a big cat away from a recent elephant or rhinoceros kill, there would have been enough meat to nourish the entire scavenging team — even with alphas being free to dominate the meat. This high-quality nourishment provided health benefits and extra energy for everyone on the team. However, where scavenged meat came in smaller packages, the alpha advantage would have become much greater.

### 7.4. Archaic humans and the advent of large game hunting

In the direct human line *Homo erectus* evolved into the still larger-brained archaic *Homo sapiens*, and active hunting of sizable game began to be more frequent, as with occasional killing of sizable groups of equines at 400 000 BP when wooden hunting javelins were in evidence (see Thieme, 1997). However, it was at 250 000 BP that a critical subsistence transition took place; at that point the archaic humans in Africa were beginning to hunt actively — going after medium-sized ungulates like antelope rather than the enormous land mammals that were occasionally scavenged earlier. The name of the game was now pursuit hunting, and this resulted in a regularized and important place being made for medium-sized game in human subsistence (Stiner, 2002).

I have hypothesized that this development was highly significant for the evolution of social control (see Boehm, 2012b): as meat became more important, its equalized sharing needed to be socially regulated — which meant keeping down individualistic alpha tendencies. Bands amounted to cooperative hunting teams that shared the same fate, and, with these not very large ungulate carcasses, hunting could only be efficient for an entire band if dominant individuals who wanted to use their power to control and basically

over-consume meat were curbed. Keep in mind that with alphas unrestrained, a mere antelope would not effectively nourish everyone in a band — it had to be shared out 'fairly', in rather modest portions.

### *7.5. Anatomically and culturally modern humans*

If we look to how contemporary mobile foragers deal with this very fundamental meat-division problem, it is remarkably standardized. They invariably treat a sizable carcass as being community rather than individual property, and they put its distribution in the hands of a neutral party who will not try to politicize the meat division and come out ahead (Boehm, 2004). Among mobile egalitarian foragers today this amounts to a cultural universal, and there is reason to believe that such practices became definitive after serious ungulate hunting phased in.

## 8. Impact on gene pools

Group sanctioning is an aggressive and deliberately manipulative way of solving social problems, and it became a potent tool in the hands of modern humans — who surely had some predictive understanding of their own social and subsistence systems. As a result, within groups social predators were punitively reformed or eliminated while, more generally, negatively-oriented social selection became a powerful force in the biological evolution of human cooperation.

As archaic humans turned to large-ungulate hunting, very likely such selection intensified with greater crackdowns on bullies, and to a lesser degree on thieves or cheaters. In turn, this would have intensified the evolutionary processes that were making for stronger and more effective conscience functions. Thus, a person who was usually prone to bullying, but was socially sensitive and could control himself, would have won out handily over a similar person with less effective self-control.

On this basis I have proposed that starting about a quarter of a million years ago there may well have been a dramatic increase in the rate of evolution of our moral capacity to internalize rules and judge ourselves by them to see what we can get away with as we try to build useful social reputations. By the time we became culturally modern, presumably our moral evolution was complete in its genetic basics, and if McBrearty & Brooks (2000) are correct we might have reached that status by 100 000 to 150 000 BP, rather

than later. Thus a major portion of what I am calling conscience evolution might have taken place rather recently, and in a relatively short span of time. If so, the several applicable types of social selection could help scholars in accounting for such rapidity (Boehm, 2012b), and because of similarities to Darwinian sexual selection (i.e., social decisions are driving the selection process) there could have been 'runaway' effects (Nesse, 2007) to further intensify the rate of selection.

## 9. Three key behavioural dimensions of our evolved morality

With respect to cooperation, there were specific normative rules that all mobile foraging bands developed and enforced. These rules heavily favored generosity, honesty and humility.

### *9.1. Generosity*

Every forager band of the Pleistocene type we are considering here will strongly approve of and actively promote generosity toward others in the band, and emphatically in a typical mobile band most of these people are not kin. These 'Golden Rule' stipulations exist because group members realize that human propensities to be generous outside the family are not all that strong; they need reinforcement. This preaching cannot only promote cooperation, but help to prevent a band's rank and file from being taken advantage of by predatory free-riders (Boehm, 2008).

Such prodding is needed for human degrees of cooperation to take place, for it is doubtful that in some basic way we are nearly as generous as we are selfish. Perhaps that is more an issue for philosophers than for anthropologists, but my main point is that people would not be regularly promulgating rules for being altruistically generous unless there were some useful potential for such behaviour residing in human nature (Boehm, 2012b). In thinking about such larger issues, I believe that philosophers would do well to follow de Waal (2013) and avoid the pessimistic and superficial portrait of an exclusively selfish and egotistic human nature that earlier sociobiological writers like Dawkins (1976) and Ridley (1996) promulgated so effectively.

This nature involves a mixture of probably rather modest but very important degrees of altruism with a strong, predatory, selfish streak that all too readily promotes predatory social deviance outside the family and sometimes within it. It is a function of group social control to protect people from

such predators, and in this context it is clearly the more generous individuals who remain at risk — unless they can consolidate their interests, band together actively, and insist aggressively on keeping their moral communities cooperative, egalitarian, and relatively free of social predation. This means that basically group sanctioning has pitted generous altruists against selfish, predatory free-riders, and an equilibrium has been reached in which the two coexist (Boehm, 2012b).

### *9.2. Honesty*

We humans universally prefer to deal with people we can trust, and we resent thieves and cheaters with their unfair tactics. Trivers' (1971) reciprocal-altruism theory led to hypotheses about dedicated, cheater-detection 'modules' in the human brain (Cosmides et al., 2005), while more realistically an arms race was envisioned between altruistic cheater-detectors and deviously predatory free riders, which involved good guys trying to avoid bad guys. However, group sanctioning provides a major alternative to avoidance, for what Trivers (1971) called 'moralistic aggression' can have strong effects in reducing devious free-riding, and such reduction comes in many contexts (Boehm, 2012b).

Thus, we may reasonably assume that everywhere in the Upper Paleolithic serious bullying was potentially punishable by death, that thieving was universally recognized as a serious dishonesty problem and sanctioned, and that lying and cheating were mainly coped with by personal avoidance but sometimes by shaming, criticism, or other group agencies of social control.

### *9.3. Humility*

Being a capable yet humble man among other capable but humble men is a key for male social success in egalitarian hunting bands, and this would apply to a lesser degree to females. In this context humility means (i) never trying to outdo others in a way that puts them down socially (Fried, 1967); (ii) being careful to avoid any semblance of giving orders when one is in a position of leadership (Boehm, 1993); and (iii) avoiding any other behaviour that is suggestive of bullying or setting oneself up as being superior (Boehm, 1999). The exception seems to be in the area of males competing legitimately for females, where individuals seeking pair-bonds sometimes kill their rivals (Knauft, 1991).

The result is the small political society that was once basic to human life everywhere. Egalitarian relations are insisted upon moralistically by subordinates, who impose serious fitness losses on major transgressors by killing them. As we have seen, they have many other anti-hierarchical tools in their kit; for instance, shaming or ostracizing someone inflicts social pain. Unlike capital punishment, however, these lesser sanctions allow for reform, and possessing an efficient evolutionary conscience makes such reform possible through self-control (Boehm, 2012b).

## 10. Levels of selection

The focus in this paper has been on a group opinion and on how individuals cope with such opinion, which may be suggestive of a group-selection model's being employed (e.g., Wilson & Wilson, 2007). However, for starters, with respect to reputations it is within a single band (or, with respect to marriage partners, within a local nexus of several bands) that hunter–gatherers compete personally for partnerships in this manner. Thus for the reputational type of social selection the level of evolutionary competition is strictly 'individual'. Furthermore, when entire groups actively apply punishment to make a deviant reform or eliminate him, the level of genetic selection is still individual. The group does serve as a critical social environment, but basically the selection impact falls upon individuals.

One might argue that bands superior in effecting social control will be affording better protection to group members against internal social predators, and that hence such groups should be genetically outcompeting groups that were less well policed and hence less cooperative. I have not made this classical group-selection argument (see Darwin, 1871) because any genetic modeling will be compromised by the facts that hunter–gatherer families change bands so frequently and inter-band marriage is common (Hill et al., 2011; see also Kelly, 1995). My emphasis, here, is on selection effects that are likely to have been robust, and these appear to have come at the level of individuals competing for good reputations, or at the level of individuals competing to stay out of serious trouble.

## 11. Discussion

Moralistic group sanctioning is so predictable and so collectivized that it may well be the most basic kind of human cooperation we experience outside

the family. In spite of the various ancestral precursors, the powerful type of social selection that results is distinctly human, and it has resulted in brain functions and states of feeling that are sufficiently unique that they set us apart as moral beings.

In effectuating our social evolution, I believe the mechanisms of natural selection have been sufficiently complex that a number of theories and models will be needed to fully explain the development of behaviours like morality and altruistic generosity. I also believe that Alexander's positively-oriented vision of social selection (especially, choosing altruists in marriage) has been a major but under-emphasized agency in this respect. Here, I have focused upon the still less recognized punitive side of such selection, and I believe its effects on fitness are likely to have been particularly robust because of capital punishment.

With respect to altruism, the division of labor between reputational and punitive modes of social selection is interesting because reputational social selection has favored altruistic traits directly, while punitive social selection had two major effects that both favored altruism less directly. One was to support a conscience, which makes it possible to internalize Golden-Rule values that reinforce altruism and are universally promoted in human bands. The other was to seriously disadvantage the antisocial free-riders who were altruists' worst enemies as genetic competitors.

At the level of everyday life, it is the human conscience that enables many who are prone to transgress to avoid becoming serious targets of angry groups; thus we regulate our personal behaviour in ways that help us to stay on the positive side of the fitness ledger. Among the Late-Pleistocene foragers who put the finishing touches on our genes, humble, honest, generous reputations assisted reproductive success, while unduly selfish, deceptive, or aggressive behaviours damaged it. This impacted altruists and free-riders alike.

An evolving conscience provided a reputation-sensitive mechanism of self-regulation, which could improve or degrade personal fitness depending on its efficiency. For humanity this was the seat of morality, and having a shame-based conscience to make flexible cost-benefit social calculations has given favored individuals (and possibly favored groups) a special edge. The advantages came through culturally-facilitated altruistic cooperation among nonkinsmen, and they were based on people behaving generously, honestly, humbly, and cooperatively. In an ultimate, evolutionary sense, none of this

would have been possible without communities that were prepared to engage in active and sometimes even lethal confrontations with the deviants in their midst.

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