

**Competitive Altruism:  
Development of Reputation-based Cooperation in Groups**

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In R. Dunbar & L. Barrett (forthcoming), *Handbook of Evolutionary Psychology*

Oxford University Press: Oxford

Draft: 11 November 2005

Word count: 6835

### Abstract

This chapter advances a new theory of altruism, competitive altruism, which might account for the uniquely moral altruistic tendency of humans. The need to form coalitions with non-kin for dealing with internal and external group threats created selective advantages for people with altruistic reputations. We present evidence from the anthropological, social psychological and nonhuman literatures, which by and large support competitive altruism theory. Finally, we discuss some implications of this theory for the establishment of reputation-based cooperation in modern human society.

## Competitive Altruism:

## Development of Reputation-based Cooperation in Groups

The greater the difficulty the more glory in surmounting it.

Skilful pilots gain their reputation from storms and tempests.

-- Epictetus (Greek Philosopher, 55 – 135 AC)

Humans are a remarkably moral social species. Humans engage in heroic acts to save the lives of complete strangers in emergencies, sometimes at substantial risk to themselves (Becker & Eagly, 2004). They cooperate with each other to help needy others, for example, spending time doing volunteer work, donating money to charitable causes, paying taxes, and contributing to a better environment (Van Vugt, Snyder, Tyler, & Biel, 2000). Furthermore, human societies often reward people for their altruistic contributions through medals for bravery in wars, statues for political and military leaders, and awards for nurses and teachers. At the same time, they punish those who fail to consider the interests of others, for example, public condemnation of cheaters, imprisonment of criminals, and execution of army deserters in wars (Levine & Moreland, 2002; Van Vugt & Chang, 2005).

The moral altruistic disposition of humans is also demonstrated in research on the prisoner's dilemma, a game involving a conflict between private and collective interests (Dawes, 1980). When this game is played in the laboratory among anonymous strangers in single interactions, hence there is really no incentive for altruism, between 40-60% of people still cooperate (De Cremer & Van Vugt, 1999). Furthermore, when game interactions are being observed by third parties that have no

involvement in the game, they are keen to punish non-cooperators even when punishing is costly (Fehr & Gaechter, 2002). It seems humans are distinctively moral. They readily empathise and cooperate with strangers and harm those who fail to do so (Boyd & Richerson, in press).

How can we explain this moral altruistic tendency of our species? First, we must be clear about what we mean by altruism and morality. We define altruism in terms of a design to benefit others at a cost to oneself (Tooby & Cosmides, 1996). In psychology, altruism is defined in terms of a *motivation* to help (Batson, 1998; Sober & Wilson, 1998). It is often assumed that this motivation is conscious, although this is by no means necessary. Research suggests that humans are often not aware of why they behave as they do (Bargh & Chartrand, 1999).

Moral altruism is defined as a design to reward altruists and punish non-altruists. Moral altruists go one step further. They not just offer help, they also reward helpers by making resources available to them while punishing non-altruists by taking resources away from them (Alexander, 1987). This is consistent with Alexander's (1987) views on morality: "To establish moral rules is to impose rewards and punishments (typically assistance and ostracism, respectively) to control social acts that, respectively, help or hurt others." (p. 77).<sup>1</sup> Moral altruism is akin to the notion of strong reciprocity as coined by Fehr and Gaechter (2002), and moralistic aggression as coined by Trivers (1971). What then is the evolutionary basis for human moral altruism?

### **Kin Explanations of Moral Altruism: The 'Big Mistake' Hypothesis**

Humans are unique in their propensity to cooperate with non-relatives, sometimes in very large groups. In other ultrasocial species, like the social insects, highly cooperative societies are based exclusively on kinship (E.O. Wilson, 1975).

The reason for this is derived from the logic of inclusive fitness, which was first developed by Bill Hamilton (1964). According to this logic, natural selection favours traits and behaviours that benefit an individual's direct fitness or the fitness of genetically related individuals -- the theory of inclusive fitness or kin selection. This is not the place for a detailed treatment of kin selection theory. For more information on the conditions under which altruism towards relatives evolves, see any evolutionary biology text (e.g., Alcock, 1998).

Kin helping accounts for a substantial part of altruism in human society today. Especially when the costs of helping are substantial, humans turn to their families for practical, financial, and emotional assistance regardless of whether they live together in a village in the Amazon (Hames, 1978) or are dispersed over a large country such as the US (Amato, 1993). We literally travel the world to see our relatives and when we die we leave our possessions to our descendants whether or not we like them (Smith, Kish, & Crawford, 1987). There is no doubt that kin selection is a major force in the evolution of altruism but to what extent can it account for the unique aspects of human sociality and morality?

Some researchers have argued that cooperation with strangers is a relatively recent cultural phenomenon. The genus *Homo* is about two million years old and during most of that time humans probably lived in relatively small groups of kin rather like their nonhuman primate cousins (Barrett, Dunbar, & Lycett, 2002). The social dispositions of humans evolved in a very different environment than today's world where social groups consist of a mixture of kin and non-kin. If humans behave altruistically towards others, it is because they erroneously believe they are dealing with kin, according to the big mistake hypothesis (Boyd & Richerson, in press). The mistake hypothesis argues that kin detection systems are imperfect because, being

around kin for much of human history, there was no need to improve them. Instead humans use cues, which are sometimes fallible, to distinguish between kin and non-kin such as physical cues like facial similarity, behavioural cues like habits, and cultural cues like language. These cues are important in deciding who to help. For example, people are more likely help a stranger in an Email study if they happen to share the same surname (Oates & Wilson, 2002). And, students trusted more money to strangers with whom they shared facial resemblance (DeBruine, 2002).

It remains to be seen whether or not such cues activate a kin detection system, and exactly how this could be empirically verified (for a promising procedure see Park & Schaller, 2005). Furthermore, the fact that most cultures have detailed kin classification systems suggests that humans are well aware of who is kin or not. Finally, a misfired kin system cannot really account for the moral aspects of human altruism, because there does not seem to be any inclusive benefits associated with rewarding altruistic or punishing non-altruistic relatives, especially in interactions with strangers.

### **Direct Reciprocity: From Small to Large Scale Cooperation**

A different version of the big mistake hypothesis is that altruistic behaviours in large groups are derived from adaptations for small group cooperation. The theory of reciprocal altruism (Trivers, 1971) suggests that cooperation between two individuals develops if they are able to “enlarge the shadow of the future” (Axelrod, 1984; p.126). Once people are locked in a relationship together, they can achieve mutual cooperation by adopting a Tit-for-tat strategy whereby after an initial cooperative move, each partner mimics the action of the other. Evidence shows that direct reciprocity leads to a stable level of cooperation in both humans (Axelrod &

Hamilton, 1981; Van Lange & Semin-Goosens, 1998) and other animals that live in small stable groups such as vampire bats (Wilkinson, 1984).

Some theorists have argued that adaptations for direct reciprocity could account for the evolution of cooperation in large groups (Cosmides & Tooby, 1992; Van Vugt & Van Lange, 2006). The main argument against this idea is that it does not address the problem of free-riding. Statistically, large groups are more likely to suffer from free-riders than small groups (Kerr, 1989). In small groups, free-riders can be identified and kept in place through a Tit-for-tat strategy. Yet, in large groups, if people respond to a non-altruist by withholding their contributions then others will follow suit, pushing the group towards a non-cooperative equilibrium (Boyd & Richerson, 1988). Further, direct reciprocity cannot explain why humans act morally by altruistically rewarding and punishing others (Fehr & Gaechter, 2002). So the question about the origins of human moral altruism remains.

### **Group Size, Indirect Reciprocity and Reputation Concerns**

To understand the evolution of moral altruism, we must first understand why humans formed alliances with non-relatives in ever larger groups. Extrapolating from data on the relative neocortex size of modern humans, compared to early humans, monkeys and apes, suggests that there has been a steady increase in average group size in human evolution (Dunbar, 1992). There are different hypotheses regarding selection pressures for an increased group size. One theory suggests that ecological pressures forced humans onto the savannah where they were at risk from attacks by predators (Dunbar, 2004). Furthermore, resources like food and waterholes would have been distributed over larger areas, which forced kin groups to form alliances with other groups. These ecological conditions consequently lead to the formation of larger groups operating in so-called fission-fusion societies (like the Aboriginals in

Australia). Another scenario is that competition between groups drove group size, resulting in an arms race between groups to grow larger and larger (Alexander, 1987; Diamond, 1997).

Engaging in coalitions with other individuals, kin and nonkin, would have been paramount to cope with the pressures of living in large groups. For example, male coalitions would be able to keep in place any single, aggressive individual, and female alliances could protect women from sexual harassment by men -- much like in modern hunter-gatherer societies (Chagnon, 1997). Pressures on groups to expand therefore created new adaptive problems in terms of finding reliable and resourceful coalition partners and advertising oneself as an attractive partner. Large groups effectively became a market place in which individuals would trade as buyers and sellers of cooperation in order to form the most successful coalitions (cf. Noe & Hammerstein, 1994).

This dynamic group context might have created new opportunities for the development of cooperation. To behave altruistically could now bring benefits, even if it was not reciprocated directly, as long as there were observers who used this information to form coalitions, leading to the formation of indirect reciprocity networks (Alexander, 1987; Nowak & Sigmund, 2005). This is how it works: If A is generous to B, and C is observing this, C expects A to also be generous to him, and will therefore pick A in a future coalition. Equally, if A is being nasty to B, observer C would want to avoid dealing with A in the future. Reputations matter a great deal in these social exchange networks, and it might pay off to develop an altruistic reputation because being seen as an altruist would create opportunities unavailable to non-cooperators. It thus became possible for cooperators to team up in a “conspiracy of doves” (Dawkins, 1976) and exclude non-cooperators from groups.



Moral altruism could have spread via the same mechanism. Acting morally, for example, punishing repeated offenders or rewarding heroes would be costly. Yet, it might be viewed by others as something desirable, perhaps a sign of leadership, which would increase opportunities for this person to engage in coalitions with others.

In sum, pressures to form large, flexible groups of both kin and non-kin kick-started a competition for the most cooperative, valuable and resourceful allies. In turn, this created selective advantages for individuals with (moral) altruistic tendencies. We refer to this process as competitive altruism (cf. Hakwes, 1993; Miller, 2001; Roberts, 1998). Unlike kin altruism and reciprocal altruism, competitive altruism provides a more promising account of the unique moral and altruistic attributes of humans. It has no problems in explaining why people cooperate in large groups of strangers – in fact, the larger the group the greater the audience. Further, it explains why people help if there is very little chance of reciprocation such as volunteering to work with a terminally ill patient, or they punish someone who has not harmed them personally such as a judge, police officer, or traffic warden (Van Vugt et al., 2000).

### **Competitive Altruism: Theory and Conditions**

Competitive altruism theory is based on two simple premises. First it assumes that there are individual differences in altruism (for reasons that we outline below). Second, in forming alliances there is competition for the most moral and cooperative partners. As a consequence, people compete to behave more altruistically than others and establish an altruistic reputation. Competitive altruism is just one of several pathways to the development of cooperation in human groups. It is therefore important to recognize the kind of altruism that is most likely to be explained by competitive altruism theory. We therefore need to specify conditions under which competitive altruism is likely to evolve and phenotypically expressed.

*Altruism as Costly Signal.* First, if altruism is to act as a signal that makes the receiver behave preferentially towards the altruist, then it must be a reliable indicator of a person's resources, motivations, and/or intentions. If it is cost-free and easy to perform by anyone then observers would not be able to discriminate between people who are genuinely altruistic and cheaters, thus making the signal unreliable. Because altruism is by definition costly, altruism is particularly likely to have evolved into an honest signal. According to costly-signalling theory (Zahavi & Zahavi, 1997), organisms sometimes engage in self-handicapping acts as a way of signalling honest information about themselves. The peacock's tail is often cited as an example, because having a long and colourful tail is extremely costly for the animal as it makes it difficult to move around and escape predation. This makes it impossible to imitate for other animals that don't have the "good" genes to grow such an ornament. Models have shown that the same logic can apply in the case of altruism (Gintis, Smith, & Bowles, 2001).

So what does altruism signal? The most obvious answer is resources. By engaging in costly altruism, people signal that they can afford to help others rather than themselves. Hence, altruism conveys both resource potential and generosity, an ideal combination in an exchange partner. In addition, it might signal self-control, strength of character, or even intelligence. For example, people who cooperate in a Prisoner's Dilemma are seen as more intelligent (Van Lange & Liebrand, 1991), presumably because it takes brainpower to appreciate the long-term benefits of cooperation. Moral forms of altruism could signal leadership potential, a desirable trait in groups (Van Vugt & Hogan, 2005).

*Attracting an Audience.* For a particular act to be classified as a signal, it must also be readily observable to others. Hence, there must be an audience for it who

interprets the act (or the intention behind it) as altruistic, and uses this information to form a judgment about the giver. Ideally, they would pass on this information to multiple others in the form a reputation (Stiff & Van Vugt, in press). From this, we predict that people are being more generous in public than in private situations, which happens to be true. People are, for example, more likely to give to street beggars in the company of a friend than alone (Goldberg, 1995). People are also extremely concerned about making a favourable impression on others (impression management; Schlenker, 1980) and they use flattery and praise to make themselves likeable to others, particularly high status others (Vonk, 2002). Impression management might explain why many people cooperate on the first trial of a Prisoner's Dilemma Game.

There should also be a preference for performing altruistic acts in large crowds, but the evidence from bystander intervention experiments actually suggests the opposite: People are less inclined to help in large groups than in small groups, but this may be because in these experiments helpers always remained anonymous (Latane & Darley, 1970). Social facilitation research (Zajonc, 1965) shows that people perform better on tasks when evaluated by others, but whether this also applies to cooperative tasks remains to be seen. The audience should, of course, be interested in the act to pay attention. For acts of altruism there is likely to be an audience, because there are benefits to be gained from being in the presence of an altruist. A look around the modern media confirms this. Heroic acts of strangers helping in emergencies, soldiers saving the lives of comrades, and philanthropic events like Comic Relief and Live Aid attract large audiences. Finally, people spend a great deal of their conversations gossiping about the moral aspects of others' behaviour (Dunbar, 2004).

*Long-term Benefits of Altruism.* Third, there must be a long-term benefit for the altruist. An evolutionary analysis delineates that competitive altruism only evolves if there are long-term benefits for the altruist (or their close relatives). We have already suggested that access to coalitions is one such benefit. While cheaters and non-reciprocators are at risk of being increasingly ostracized from groups, altruists are in huge demand as coalition partners in future social exchanges like sharing food. But, benefits may be more subtle. For example, altruists may recoup the costs of their actions by increasing their attractiveness as a mate, thus being able to attract more and better sexual partners (Miller, 2002; Roberts, 1998). Perhaps this is the reason why males tend to be especially kind and generous in the presence of females (Campbell, Simpson, Stewart & Manning, 2002; Goldberg, 1995). It is also possible that altruists profit indirectly: Being in a group with altruists, their group would fare better in competitions with groups containing fewer altruists (Alexander, 1987; Darwin, 1871; Sober & Wilson, 1998).

*Individual Differences in Altruism.* Competitive altruism theory may explain why moral altruism is widespread in humans, but it does not explain why there are substantial individual differences (Kurzban & Houser, 2005; Van Lange, Otten, DeBruin & Joireman, 1997; Van Vugt, Meertens, & Van Lange, 1995). One explanation is the cost of altruism. Only people with substantial resources could afford to be generous, as costly signalling theory suggests, and many people simply cannot afford to forego a golden opportunity to cheat (Frank, 1988). Another reason is that in some societies, it is easier to get away with cheating, for example, because the society is large and mobile, putting limits on the importance of reputations. A third reason is that a society might be so small that cooperation occurs primarily within

family networks, and cooperating with strangers is too rare for people to invest in an altruistic reputation (cf. Yamagishi, 1986).

*Competitive Altruism: Anthropological and Nonhuman Evidence*

Because of the novelty of the competitive altruism theory, there have not been many tests on core predictions of this theory. Earlier we presented some anecdotal results as well as results from research designed for a different purpose. We now turn to evidence from studies carried out specifically to test predictions derived from competitive altruism theory. We start with the anthropological and non-human literatures.

There are various examples of costly displays of altruism found in this literature. For example, among the Ache of Parauquay, individuals who share more than average with others in good times, tend to receive more food from people when they are sick or injured than those who have been less generous in the past (Gurven, Allen-Arave, Hill & Hurtado, 2000). Thus, sharing food in good times serves as an insurance policy to cover for bad times. Among the Shuar, individuals who take on voluntary administration jobs, are rewarded with status and prestige (Price, 2003). Such social benefits might be the main reason for killing large game in hunter-gatherer societies (Hawkes, 1993)

On various Melanesian islands, a few years after someone's death, the family of the deceased puts on an elaborate feast to commemorate the dead person. All the guests receive a bounty of food and gifts, with no expectation of reciprocation. One of the dishes is turtle meat, which is very difficult to obtain. Giving out as much turtle meat as possible serves as an honest signal of the physical quality of the family members, increasing the family's reputation and esteem (Smith & Bleige- Bird, 2000). Similarly, among Native American clans in the North-West Pacific, it is

common for chiefs to organize large feasts -- a “potlatch” -- to which members of neighbouring clans were invited to indulge in a bonanza of delicacies such as salmon. This public display of generosity possibly serves to build and strengthen coalitions between neighbouring clans in the face of threats from rivals (Bliege Bird & Smith, 2005).

#### *Evidence from Nonhumans*

These displays of generosity are paralleled by activities in nonhuman primates, particularly chimpanzees. After killing a small animal, like a Colobus monkey, chimpanzees sometimes share their meat with other members in their troop, particularly females and possibly in exchange for sex (De Waal, 1996). There is also evidence that individuals select grooming partners based on their reputation as a reciprocator (Barrett, Henzi, Weingrill, Lycett, & Hill, 2000). Furthermore, chimpanzees only solicit food from individual with a reputation as a food-sharer (Russell & Dunbar, 2005). Finally, there is anecdotal evidence that in babblers, a highly social bird species, individuals compete for prestige through being altruistic in allofeeding and nestguarding (Zahavi & Zahavi, 1997; but see Wright, 1997).

These are just some nonhuman examples of behaviour that may be shaped ultimately by competitive altruism tendencies. Humans have probably built on this primordial tendency by extending the scale, variety, and intensity of these competitive altruism displays in human societies.

#### *Competitive Altruism: Laboratory Evidence*

In recent years, researchers have tested various predictions derived from competitive altruism theory in the laboratory, using data from computer simulations and small group experiments. Although this research is ongoing, it is encouraging that many of the predictions from competitive altruism theory have been supported so far.

If the conditions outlined by competitive altruism theory are met, cooperation among strangers is sustained in even large groups.

Computer simulation studies have revealed, for example, that when agents can assess the altruistic “reputation” of other agents, and can use this information to decide whether or not to cooperate with a given interaction partner then cooperation can evolve. One reputation method, called image scoring, gives a score to individuals based on their previous interaction history (Nowak & Sigmund, 1998). If an individual aids someone in a round a point is added to his reputation score, whereas if he fails to give aid, he loses a point. In image scoring, building up a reputation as an altruist is beneficial, because other agents use the image scores of other agents to decide whether to cooperate or defect. There are other types of reputation strategies, for example a good standing-strategy (Sugden, 1986) which takes into account the context of a partner’s previous behaviour. This has been shown to be superior to image scoring (Leimar & Hammerstein, 2001). Undoubtedly, there are other kinds of reputation systems that could give an edge to altruists, but they still await further investigation (Nowak & Sigmund, 2005; but see Panchanathan & Boyd, 2004).

Small group experiments have also provided support for various aspects of competitive altruism theory. Such experiments are usually conducted with small groups of students that are given a Prisoner’s Dilemma type task to study the development of cooperation in groups. In one study, cooperation was achieved when participants played against a stooge (a preprogrammed computer strategy) that matched the investment of the participants, leading effectively to an escalation of cooperation, as competitive altruism theory would predict (Roberts & Renwick, 2003). In another study, members of four person groups were more likely to contribute to a public good if they knew that afterwards they could be selected to

participate in a dyadic cooperative game with one of the other group members (Barclay, 2004).

Essentially the same result was obtained in a set of studies by Hardy & Van Vugt (2005). These researchers also found that public good contributions increased when group members' contributions were made public, which is entirely consistent with the competitive altruism idea. A recent study shows that even a pair of artificial eyes on a computer screen enhances people's cooperation more in an otherwise entirely anonymous situation (Haley & Fessler, 2005). Thus, there is abundant evidence that reputational concerns lie at the basis of many altruistic activities even in largely (but not exclusively) anonymous laboratory settings.

Some experiments have also showed some clear benefits for the altruists. For example, members who contributed more to the public good were given more status and prestige than other group members, and were more likely to be selected as group leaders and representatives (Hardy & Van Vugt, 2005). In addition, altruists in the public good game were chosen more often as coalition partners in a subsequent game (Hardy & van Vugt, 2005). This resembles the results of a study by Milinski, Semman, and Krambeck (2002) who found that when individuals were involved in two games at the same time, a public goods game and a reciprocity game (Wedekind & Milinski, 2000), people in the later game donated more to people who acted altruistically in the public goods game.

Taken together, these findings suggest that altruism is influenced by reputational needs and that having an altruistic reputation brings benefits to individuals.

### **Conclusions and Implications**



Competitive altruism theory proposes that altruism evolves once there are selection pressures to form coalitions with other individuals, non-kin, in large groups. In human evolution, coalition formation appears to be a major force in dealing with group size, resource unpredictability, and intergroup competition (Alexander, 1987; Dunbar, 2004). A general preference for more cooperative partners then creates a competitive market in which people with prosocial traits are more likely to be chosen as coalition partners, friends, or mates. Because having an altruistic reputation pays off in such an environment, it is paramount for people to invest in it, which is best achieved through public displays of morality and altruism. Could this theory explain the peculiar moral aspects of human nature?

Several core predictions of competitive altruism theory are supported so far in empirical research. For example, people are more generous in public than in private settings. Altruistic individuals are selectively rewarded by observers and non-altruists are selectively punished. Computer simulations show that if reputational information is available, altruism becomes an evolutionary stable strategy. Finally, anthropologists have documented numerous public displays of generosity, like funeral parties, potlatches, charity and philanthropy, which could be accounted for by competitive altruism theory.

Many aspects of competitive altruism theory remain to be tested. For example, do altruists recoup the costs of their activities by entering in productive, cooperative alliances, or do they benefit in other ways, for example, by attracting mates? Some have suggested that altruism is an honest signal to convey one's qualities as a sexual partner (Zahavi & Zahavi, 1997), but there is no empirical evidence for this yet. Furthermore, exactly what does altruism signal? Does it primarily signal resource potential or also virtues like trust and benevolence, and possibly even intelligence.

Finally, does moral altruism have a distinctive signalling quality, and, if so, what does it signal; leadership potential perhaps? Also, competitive altruism predicts that people should sometimes act altruistically to people who do not need it, and that potential recipients should sometimes refuse help when they need it. This needs to be examined in further research.

There are several theoretical issues to be resolved. First, we acknowledge that competitive altruism is just one of the evolutionary routes to human cooperation. Kin helping, direct reciprocity, and group-selected altruism probably account for a large proportion of altruism in human society (Amato, 1993; Penner, Dovidio, Schroeder & Piliavin, 2005; Sober & Wilson, 1998). Competitive altruism is probably most suitable to explain more public displays of helping, like philanthropy, heroism, bystander intervention, charity work, and volunteering. A strength of the theory is that it has no problem in accounting for unreciprocated altruism because it presupposes that there will be compensating long-term benefits. Equally, this kind of altruism does not have to be enforced by groups because they can simply avoid interactions with non-altruists; hence there is no second order free-rider problem.

Is altruism always a desirable trait? Being seen as an indiscriminate altruist, for example, helping members of antagonistic groups may not be regarded as a desirable quality in some coalitions, for example, in groups at war. Also, someone who consistently helps defectors might develop a bad reputation (Nowak & Sigmund, 2005). Finally, could people not easily fake altruism in order to get access to desirable groups or mates? If people could easily obtain an altruistic reputation it would be a serious problem for the theory because it would make altruism a meaningless signal. There are two arguments against this. First, altruism is by definition a costly activity, and so it automatically excludes people who cannot afford to be altruistic (e.g., a poor

individual cannot spend much on charity). Second, across all human societies, people work extremely hard to invest in their reputations, and there are reputation systems in place to constantly monitor whether people's status and esteem matches their contributions to the group.

There are a number of unique features of human societies facilitating competitive altruism and reputation-based cooperation in groups. For example, language is a unique human capacity that is believed to have evolved to build alliances in large, dispersed groups (Dunbar, 2004). One of the most frequent conversation topics is gossip about others, not present, and the gossip tends to revolve around the status, achievements and failures of other people. So, it is perhaps not too far-fetched to assume a relationship between language and the spread of competitive altruism in humans.

Finally, there are a number of other unique aspects of human culture that might have a basis in competitive altruism, such as philanthropy, religion, the military, architecture, science, artistry and entertainment. In all of these domains, there are individuals "showing off" their resourcefulness by contributing to public goods that, once they are available, are free for all to use and consume. For example, once the 19<sup>th</sup> century British engineer Brunel had created a design to build steam boats, they could be built and used by anyone. In this regard, it is perhaps not surprising to find that the highest status members in human society are scientists, doctors, military and political leaders, artists, and entertainers, whose contributions benefit all (Hardy & Van Vugt, 2005b). Competitive altruism may explain why social hierarchies in human groups are built on status and prestige rather than dominance and coercion as in many other social species (Henrich & Gil-White, 2001). We should be pleased about this.

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Footnotes

<sup>1</sup> This is not to imply that morality and altruism are the same. Some forms of altruism may not be guided by moral principles, for example, helping one's own child.

Furthermore, sometimes moral principles might lead to selfish rather than altruistic behaviour, for example, when a person feels entitled to take money from others (for a discussion of the relationship between altruism and morality, see Sober & Wilson, 1998).