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The Evolution of Morality

Matthew Rutherford

Morality is essential to human identity. Since Darwin and Wallace proposed natural selection to explain the complexities of organisms, evolutionary biologists have sought explanations for all aspects of human nature including morality. One way to establish how far morality is exclusive to humans is to examine moral precursors in closely-related species. The advantage of such a characteristic initially seems contrary to the 'selfish' process of natural selection, however various ways in which such a trait has adaptive value have been proposed. Also, the extent to which morality is actually part of human identity, a product of sophisticated human culture rather than being hard-wired into our minds by evolutionary process, is a fascinating and current area of scientific dialogue.

INTRODUCTION

Influential biologist, surgeon and philosopher Thomas Huxley argued the case, in his famous lecture *Evolution and Ethics* (1894), that human nature is essentially evil: the consequence of a cruel and unforgiving natural environment. Huxley, a staunch supporter and friend of Charles Darwin, suggested that morality was simply a human cultural construction, created in order to counter egotistical human nature.¹ However, it is now clear that moral systems occur and are adhered to universally across cultures, indicating that contrary to Huxley's beliefs morality does have evolutionary origins and is a fundamental component of human nature.²

These issues are part of what is arguably one of the most significant debates of contemporary science and philosophy: the extent to which evolutionary processes

MATTHEW RUTHERFORD has completed three years of an MBChB. During his studies he has undertaken 'special study modules' in literature, evolution and clinical pharmacology. He is considering an intercalated BSc in clinical medicine next year, potentially specialising in cardiovascular science.

¹ Thomas H. Huxley, *Evolution and Ethics* (Princeton: Princeton University Press, 1989).

² Jessica C. Flack and Frans B. M. de Waal, "'Any Animal Whatever' Darwinian Building Blocks of Morality in Monkeys and Apes", *Journal of Consciousness Studies*, 7, No.1-2 (2000): 1-29.

influence contemporary human behaviour and cognition. Ever since Darwin and Alfred Russel Wallace proposed their influential treatises on 'descent with modification', leading evolutionary biologists have put forward the idea that seemingly exclusive human characteristics such as morality are a result of the natural selection process. However, since the arrival of new social scientific disciplines such as psycho-analysis at the turn of the 20th century, there has been a separate school of thought, that all human behaviour is culturally determined, that the mind has essentially evolved into a "blank slate".³

The debate can be advanced through various avenues. Examining the behaviour of closely related species to determine if it is analogous or homologous to our own can help establish to what extent morality is a product of natural selection. Consideration of the adaptive value of morality is also crucial to furthering our understanding of the issue.

MORALITY DEFINED

In the response to discussion of their recent review Jessica C. Flack and Frans B. M. de Waal first highlight the difficulty of attempting to define a concept with so many potential interpretations before offering this "broad characterisation":

*We understand morality as a sense of right and wrong that is born out of group-wide systems of conflict management based on shared values.*⁴

This definition is similar to Alexander's (1987), where morality is characterised as based on systems of indirect reciprocity and Boehm's (2000), which indicates it is the result of common principles imposed on the individual by the group.⁵ Flack and de Waal go on to describe an arrangement of regulations and incentives to settle group

³ Debra Lieberman, John Tooby and Lada Cosmides, "Does Morality have a Biological Basis? An Empirical Test of the Factors Governing Moral Sentiments Relating to Incest", *Proceedings of the Royal Society* 270 (2003): 818.

⁴ Jessica C. Flack and Frans B. M. de Waal, "Being Nice Is Not a Building Block of Morality Response to Commentary Discussion", *Journal of Consciousness Studies*, 7, No.1-2 (2000): 67-77.

⁵ Richard D. Alexander, *The Biology of Moral Systems* (Hawthorne, NY: Aldinede Guyter, 1987); Christopher Boehm, "Conflict and the Evolution of Social Control", *Journal of Consciousness Studies* 7 (Special Issue on Evolutionary Origins of Morality) (2000): 79-183.

rivalries and disputes in the service of the 'greater good'; the individual benefits from resource distribution and collective action. Therefore, according to this definition, prosocial behaviour is integral to morality.⁶

MORAL MONKEYS?

Considering the degree to which other closely related species possess morals or moral precursors helps us to establish whether our common ancestor was a moral being and contributes to the debate on the extent to which morality is indeed an evolved behaviour or is a cultural phenomenon. Darwin's thoughts on the extent to which animals possess ethical values are related to the creature in question's cognitive ability:

*Any animal whatever, endowed with well-marked social instincts, the parental and filial affections being here included, would inevitably acquire a moral sense or conscience, as soon as its intellectual powers had become as well developed, as in man.*⁷

Darwin seems quite confident that, provided a creature is sufficiently intellectually developed, it will be able to absorb morality from its relations. In more recent years proponents of Huxley's position (stated above) have suggested a more extreme view of human nature. In 1976 the evolutionary biologist Richard Dawkins explained that people are "born selfish" and that in seeking to build a world in which individuals work together in an altruistic fashion we can expect little help from our genetic makeup.⁸ Renowned evolutionary biologist George C. Williams accounts for the presence of morality in a slightly different manner:

*I account for morality as an accidental capability produced, in its boundless stupidity, by a biological process that is normally opposed to the expression of such a capability.*⁹

⁶ Ibid.

⁷ Charles Darwin, *The Descent of Man, and Selection in Relation to Sex* (Princeton: Princeton University Press, 1982).

⁸ Richard Dawkins, *The Selfish Gene* (Oxford: Oxford University Press, 1976).

⁹ George C. Williams, "Reply to Comments on 'Huxley's Evolution and Ethics in a Sociobiological Perspective'", *Zygon*, 23 (1988): 383–407.

However, Flack and de Waal question Dawkins in that, if morals are not biologically inherent then what force aided humans in denying their nature and establishing societal norms. They also put it to Williams that if morality is an evolutionary accident, then why has natural selection not dealt with it appropriately as it would any other trait which has no adaptive value. It is the lack of substance of these positions that have encouraged Flack and de Waal to review the existence of foundations of morality in non-human primates. The framework that they apply for addressing such issues proposes that the origins of morality can be explained by evolutionary biology but that the *specifics* of our contemporary moral structures should be analysed in a different manner.¹⁰

Food-sharing in animal communities can be used as a tool to assess the occurrence of moral behaviour. De Waal has repeatedly investigated the food sharing tendencies of brown capuchin monkeys and chimpanzees.¹¹ In one experiment, adult capuchins were broken up into pairs and placed in a test compartment separated into two sections divided by a mesh partition. The individual with access to food was free to consume it all by himself or to actively or passively (by allowing the other monkey to have dropped pieces) share it. The set-up was then rearranged so that the second individual had access to the food. Reciprocal sharing was observed, albeit with some variation between the sexes; females were inclined more to reciprocal sharing, while males were less selective in terms of who they shared with and were more liberal with amounts given. Although this experiment was conducted in an artificial environment, similar observations have been made in colonies and in the wild.¹²

This type of sharing can be described as symmetrical reciprocity, that is, a by-product of frequent association. However if calculated reciprocity, which is based on the ability to keep mental note on favours given and received, can be demonstrated, then more cognitively demanding decisions must be undertaken, which point towards the possession of expectations in these non-human primates. Another manner in which calculated reciprocity is displayed is in the retributive behaviour of chimpanzees. This form of reciprocity requires prescriptive rules and expectations which, Flack and de Waal say, “essentially reflects a sense of social regularity, and may be a precursor to

¹⁰ Flack and Waal, *Any Animal Whatever*, 1-29.

¹¹ E.g., Frans B. M. de Waal “Food-sharing and Reciprocal Obligations in Chimpanzees, *Journal of Human Evolution* 18 (1989): 433-459; Frans B. M. de Waal, “The Chimpanzee’s Service Economy: Food for Grooming”, *Evolution and Human Behavior*, 18 (1997): 1-12.

¹² *Ibid.*

the human sense of justice".¹³ Their conclusions are criticised, notably by Jerome Kagan, who argues that human morality is defined by intention, not by behaviour and due to the fact that biologists cannot know animal's intentions they should not automatically classify certain behaviour which benefit another as necessarily altruistic.¹⁴ To what extent these reciprocity mechanisms are cognitively mediated remains uncertain, but at least for chimpanzees there is evidence for the function of memory and expectation.

Community concern is another building element of morality which has been observed in certain primate populations.¹⁵ Flack and de Waal cite the example of a female who demonstrates this concern in trying to resolve a conflict in which she played no part and thus restoring a relationship that is not her own. Such examples are probably rare in primates, and many only occur significantly in apes. Also an empathetic behaviour, 'active consolation', is well documented in chimpanzees. This consists of a third party advancing towards and connecting with a recipient of aggression following a physical confrontation. An example would be a juvenile approaching and embracing an adult male who has just lost a fight with a competitor.

The question remains, are non-human primates capable of actual concern for others founded on considering an individual's perspective? There is some evidence to advocate that apes are capable of cognitive empathy in a similar way to humans but whether monkeys possess a less substantial model of this ability is still uncertain. The fact that certain 'building blocks' of morality can be observed in non-human primates suggests that our common ancestors were likely to have possessed similar traits and therefore indicates that components of morality are evolutionarily advantageous.

ADAPTIVE VALUE

Despite the fact that numerous moral theorists and biologists are dubious that natural selection can produce components of moral systems such as the capacity for sympathy and empathy or even the capacity for non-kin based cooperation that requires the suspension of short term, independent interests, there also exists a tradition going

¹³ Ibid.

¹⁴ Jerome Kagan, "Human Morality is Distinctive", *Journal of Consciousness Studies*, 7, No.1-2, (2000): 46-48.

¹⁵ Flack and de Waal, *Any Animal Whatever*, 1-29.

back to Petr Kropotkin (1902) which suggests that the animals assist each other specifically because by doing so they achieve long term, collective benefits of greater value than the short term benefits derived from straightforward competition. More recently Robert Trivers has forwarded his concept of 'reciprocal altruism' in which unlike simultaneous cooperation, acts are carried out that while being valuable to the recipient, are costly to the performer. This inequality is eliminated as soon as a good deed of equivalent significance is returned.¹⁶

Bernard Thierry however explains that evidence regarding this phenomenon of calculated reciprocity in chimpanzees is still questioned, but that this does not detract from the potential adaptive value of systems that enhance exchanges and lower conflicts of interest. He crucially cites Stephen J. Gould and Elisabeth S. Vrba (1982): the use of characteristics that were not primarily intended for their current function is a principal mechanism of evolution. These features, such as cognitive skill and motivational dispositions, may have represented a source of raw material for the ensuing development of morality.¹⁷

Professor of Psychiatry and Psychology at the University of Michigan, Randolph M Nesse is a critic of the position adopted by Elliott Sober and David Sloan Wilson (1998) that for characteristics such as morality and altruism to have evolved, group selection must have been required. Randolph Nesse maintains that, although models have demonstrated that group selection can occur under stringent conditions, it is neither necessary nor sufficient. He suggests that the advantage may come from sexual selection, social selection, or the adaptive value for a capacity for commitment, and also possibly from cooperation and kin selection. On an issue of terminology, interestingly and crucially, he cites the difference between altruism and selfishness and 'evolutionary altruism' and 'evolutionary selfishness', noting that the use of morality as a metaphor in evolutionary biology has led to a substantial degree of confusion!¹⁸

Darwin was familiar with the philosophy of David Hume and Adam Smith and was aware that Hume's thinking on human nature fitted his own perspective that the two

¹⁶ Ibid.

¹⁷ Bernard Thierry, "Building Elements of Morality are not Elements of Morality", *Journal of Consciousness Studies*, 7, No.1-2, (2000): 60-62.

¹⁸ Randolph Nesse, "How Selfish Genes Shaped Moral Passions", *Journal of Consciousness Studies*, 7, No.1-2 (2000): 227-231.

aspects of human nature, the dark, competitive side, and the cooperative and compassionate side could co-exist as evolutionary strategies.¹⁹ This position seems to be an appropriate point from which the debate on the adaptive value of morality can be explored.

EVOLVED BEHAVIOUR VS. CULTURALLY DETERMINED

In their investigation of how incest is viewed in terms of morality, Debra Lieberman et al. distinguish between two potential mechanisms of cultural transmission in relation to moral sentiments regarding third-party sibling incest; vertical and horizontal. The vertical model contends that offspring absorb parental attitudes towards sexuality. However when length of co-residence with an opposite-sex sibling is controlled for, the relationship between parental attitudes and children's own perception of sibling-incest drops and ceases to be significant. The second route of cultural transmission is through the immediate social environment i.e. peer attitudes. Lieberman et al suggest that if peer attitudes do have an effect, these would be mirrored in the subject's own position towards sexual behaviour, and the subject's restrictiveness and judgements of moral wrongness related to sibling incest would be correlated. However there was no correlation. Taken together, the conclusions related to horizontal and vertical cultural transmission indicate that morality regarding incest is acquired by other means than cultural transmission.²⁰

Sandra and Werner Güth, as well as noting Flack and de Waal's lack of consideration of immorality as an evolved behaviour, tend to favour 'cultural evolution' over genetic. They make the point that to imagine all the social conduct of primates to be based on instinct would require a much too complex genotype. They instead propose that evolution's 'escape route' was to develop a costly brain capable of cognition and calculated choices with the capacity to assess one's social environment and the likely consequences of one's actions. However, they do accept that morality indefinitely requires many genetically determined facilities. To further establish to what extent morality is an evolved phenomenon, they suggest observing primate individuals brought up outside their natural environment interact with zoo or wild populations.²¹

¹⁹ Flack and de Waal, "Any Animal Whatever' Darwinian Building Blocks of Morality in Monkeys and Apes", *Journal of Consciousness Studies*, 7, No.1-2 (2000): 1-29.

²⁰ Lieberman et al., *Morality*, 818.

²¹ Sandra Güth and Werner Güth, "Morality Based on Cognition in Primates", *Journal of Consciousness Studies*, 7, No.1-2 (2000): 43-46.

CONCLUSION

As our understanding of what makes us human continues to expand and deepen, and as it becomes clear that so much of our nature is determined by a ruthless, unthinking process such as natural selection, it is crucial to realise that we should not revert to some form of Social Darwinism or use this interpretation of 'nature's way' to guide or justify our behaviour.

Humans may indeed be the only actual moral beings; even though it is arguable that several elements necessary to human morality can be demonstrated in other primates, there is no reason to believe that other animals have moral systems that reflect the intricate nature of our own.

According to the vast majority of traditional religious thought humans were created rather than having evolved. As a result of this we have grown attached to the notion of considering ourselves to be unique and qualitatively superior. It is essential to advancing understanding of our existence that we continue to question such established doctrines.

REFERENCES

- Alexander, Richard D. *The Biology of Moral Systems*. Hawthorne, NY: Aldine de Guyter, 1987.
- Boehm, Christopher. "Conflict and the Evolution of Social Control." *Journal of Consciousness Studies* 7 (Special Issue on Evolutionary Origins of Morality) (2000): 79-183.
- Darwin, Charles. *The Descent of Man, and Selection in Relation to Sex*. Princeton: Princeton University Press, 1982 (1871).
- Dawkins, Richard. *The Selfish Gene*. Oxford: Oxford University Press, 1976.
- de Waal, Frans B. M. "Food-sharing and Reciprocal Obligations in Chimpanzees." *Journal of Human Evolution* 18 (1989): 433-459.
- de Waal, Frans B. M. "The Chimpanzee's Service Economy: Food for Grooming." *Evolution and Human Behavior*, 18 (1997): 1-12.
- Flack, Jessica C. and Frans B. M. de Waal. "'Any Animal Whatever' Darwinian Building Blocks of Morality in Monkeys and Apes." *Journal of Consciousness Studies*, 7, No.1-2 (2000): 1-29.
- Flack, Jessica C. and Frans B. M. de Waal. "Being Nice Is Not a Building Block of Morality Response to Commentary Discussion." *Journal of Consciousness Studies*, 7, No.1-2 (2000): 67-77.
- Gould, Stephen J. and Elisabeth S. Vrba. "Exaptation; a Missing Term in the Science of Form." *Paleobiology* 8,1 (January 1982): 4-15.
- Güth, Sandra and Werner Güth. "Morality Based on Cognition in Primates." *Journal of Consciousness Studies*, 7, No.1-2 (2000): 43-46.
- Huxley, Thomas H. *Evolution and Ethics*. Princeton: Princeton University Press, 1989.

- Kagan, Jerome. "Human Morality is Distinctive." *Journal of Consciousness Studies*, 7, No.1-2 (2000): 46-48.
- Kropotkin, Petr Alekseevich. *Mutual Aid: A Factor of Evolution*, rev. ed. London : Heinemann, 1908
- Lieberman, Debra, John Tooby and Lada Cosmides. "Does Morality have a Biological Basis? An Empirical Test of the Factors Governing Moral Sentiments Relating to Incest." *Proceedings of the Royal Society*, 270 (2003): 818.
- Nesse, Randolph. "How Selfish Genes Shaped Moral Passions." *Journal of Consciousness Studies*, 7, No.1-2 (2000): 227-231.
- Sober, Elliott and David Sloan Wilson. *Unto Others*. Cambridge, MA: Harvard University Press, 1998.
- Thierry, Bernard. "Building Elements of Morality are not Elements of Morality." *Journal of Consciousness Studies*, 7, No.1-2 (2000): 60-62.
- Williams, George C. "Reply to comments on 'Huxley's Evolution and Ethics in a Sociobiological Perspective'." *Zygon*, 23 (1998): 383-407.

