The Evolution of Cooperative Behavior and Its Implications for Ethics

Stephen G. Morris†

While many philosophers agree that evolutionary theory has important implications for the study of ethics, there has been no consensus on what these implications are. I argue that we can better understand these implications by examining two related yet distinct issues in evolutionary theory: the evolution of our moral beliefs and the evolution of cooperative behavior. While the prevailing evolutionary account of morality poses a threat to moral realism, a plausible model of how altruism evolved in human beings provides the grounding for a research program that focuses on achieving some of the more practical goals shared by ethicists.

1. Introduction. The subject of evolution has proved to be a prickly one for philosophers studying ethics. Although philosophers are still wrestling with the question of what role evolutionary theory should play in informing philosophical debates in ethics, their efforts to integrate the insights of evolution into the study of ethics have resulted in research programs that can be roughly classified as either descriptive or normative or metaethical (or some combination thereof). To date, most of the work done in this field has been primarily descriptive and has focused on explaining the evolutionary origins of our moral beliefs and/or behavior (e.g., Darwin 1871; Wilson 1975; Sober and Wilson 1998; de Waal 2006). While the insights generated from the descriptive aims of evolutionary ethics have generally been well received by philosophers, the track record of those who have used evolutionary theory to produce normative conclusions has been less impressive. Philosophers who have taken this approach have run into formidable barriers. For instance, Herbert Spencer's attempt to define morally good actions as those that support evolutionary processes has led many to charge him with running afoul of Hume's is-ought distinction and Moore's naturalistic fallacy. The reputation of the

†To contact the author, please write to: Department of Political Science, Economics, and Philosophy, College of Staten Island/City University of New York, 2800 Victory Blvd., Staten Island, NY 10314; e-mail: stephen.morris@csi.cuny.edu.

Philosophy of Science, 76 (December 2009) pp. 915–926. 0031-8248/2009/7605-0023$10.00
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https://doi.org/10.1086/605810 Published online by Cambridge University Press

normative arm of evolutionary ethics is further sullied by the use of the views of some of its practitioners—especially Spencer's—to support the policies of the German Nazi Party (Ruse 1995b). Finally, philosophers have more recently begun to consider what the metaethical implications of evolution are. For those taking this route, a common conclusion is that an evolutionary account of our moral beliefs provides reason for rejecting moral realism (e.g., Ruse 1995a; Joyce 2001; Greene 2010).

In this paper, I examine evolutionary theory's implications for the study of ethics, including its prospects for providing a positive research program. Although I will not be taking a stand on whether moral antirealism is warranted by the prevailing evolutionary accounts of morality, I do think that the threats against moral realism are significant enough to make philosophers consider how ethics might be practiced should moral realism turn out to be false. Section 2 of this paper addresses how evolutionary theory provides ammunition to moral antirealists. In section 3, I discuss how the evolution of altruism in human beings points to a new ethical approach that may achieve some of the more practical goals shared by philosophers studying ethics. Chief among these goals is how to increase cooperative behavior among human beings. By focusing on achieving practical ends rather than on attempting to validate particular normative claims or ethical theories, the study of ethics would be able to forge a relationship with evolutionary theory that is more complimentary than adversarial.

2. The Evolutionary Challenge to Moral Realism. In the discussion that follows, I adopt Geoffrey Sayre-McCord's understanding of "moral realism" as consisting of two theses: (1) moral claims are either literally true or false, and (2) some moral claims are literally true (see Sayre-McCord 1988, 5). The evolutionary challenge to moral realism addressed in this paper rejects only the second of these theses. Rather than questioning whether moral claims have truth values, the evolutionary attack against moral realism asserts that all moral claims—such as "It is wrong to steal"—are false. According to this type of antirealism—technically referred to as an "error theory"—the preceding statement is rendered false by the fact that there is no property of wrongness that could make it true. For the error theorist, concepts such as wrongness have the same ontological status as the concept phlogiston. Any statement asserting that an object contains phlogiston is rendered false by the fact that the term 'phlogiston' does not correspond to anything in the actual world. Similarly, the error theorist holds that because there are no properties in the world that correspond to our concepts of moral rightness or moral wrongness, any statement attributing these types of properties to either agents or actions is false.

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2.1. Morality as an Adaptation. The issue of whether or not moral truths exist did not garner a substantial amount of attention among ethicists until relatively recently. It was not until the rise of logical positivism in the early twentieth century—and, more specifically, the noncognitivist attacks on moral realism that this movement fostered—that expressions of doubt concerning moral realism became relatively common in philosophical discourse. Although powerful objections to noncognitivism led increasing numbers of philosophers to discredit it toward the end of the twentieth century, the antirealist sentiments of the noncognitivists set the stage for more sophisticated arguments against moral realism. Michael Ruse and Edward O. Wilson (1984) offered a particularly potent case against moral realism founded on the idea that our moral beliefs are the product of evolutionary forces that fostered cooperation among our evolutionary ancestors. Ruse and Wilson maintained that since our moral beliefs are evolutionary adaptations, there is no legitimate reason for thinking that such beliefs correspond to anything real. Ruse sums up this view as follows:

> Normative ethics is a biological adaptation, and I would argue that as such it can be seen to have no being or reality beyond this. We believe normative ethics for our own [biological good], and that is that. (1995a, 103–104)

In response to this line of argument, philosophers have been quick to point out that the fact that a faculty has evolutionary origins does not entail the falsity of all beliefs generated by this faculty. As Zachary Ernst (2007) acknowledges, the fact that our visual faculties are the product of evolution does not entail the falseness of our beliefs regarding what we see. Ernst recognizes, however, that our moral beliefs are significantly different from our beliefs about what we see, because only the latter are subject to empirical verification. In regard to our beliefs generated by way of visual perceptions, we have strong reasons to believe that at least some of them are true since, on the one hand, our visual faculties have proved to be an accurate guide to the world in the past and, on the other hand, the things we perceive visually can often be verified through other perceptual means (touching, etc.). In regard to our moral beliefs, however, there seems to be no means available to us—empirical or otherwise—by which we can verify them as true. As Ernst points out, "If we are unsure about the correct moral theory, then we do not know what facts the moral faculty should track" (2007, 139). Since there is no consensus about which moral theory is correct, there is apparently no way of confirming whether any of our moral beliefs are true.

Lurking in the background of the Ruse-Wilson attack on moral realism is a plausible thesis, namely, that one ought not assert the truth of any

https://doi.org/10.1086/605810 Published online by Cambridge University Press

claim that is not open to confirmation through—or that is at least supported by—either a priori reasoning (e.g., mathematical truths) or empirical verification (e.g., the external reality of the objects we see).[1] Given Ruse and Wilson's account of moral beliefs, there is reason for doubting that any such confirmation of—or support for—these beliefs is possible. Under Ruse's account of our moral beliefs, their existence is due to their ability to provide a survival advantage rather than to their ability to track facts about the world. Were our moral beliefs to track actual moral facts, this would be entirely coincidental to their purpose. Contrast this with our visual faculty, which is able to provide a survival advantage precisely because of its ability to track real entities in the world. If Ruse is correct in thinking that our faculty for making moral judgments was not selected for its ability to apprehend facts, then it is difficult to defend the position that moral facts exist. After all, intuitions seem to be the sole basis we have for positing the existence of moral facts. But since a plausible evolutionary account of our moral intuitions traces their origin to factors unrelated to any moral facts that might exist, such moral intuitions do not constitute adequate grounds for positing the existence of such facts. Ernst puts the matter thusly:

> Specifically, if the mechanism by which the belief is formed bears no relationship to the facts that would make the belief true, then the belief does not have any evidential value. This is a sort of genetic argument, but not a fallacious one. (2007, 131)

The main idea behind the Ruse-Wilson evolutionary argument against moral realism is not that the evolutionary origin of our moral judgments is itself grounds for rejecting all our moral beliefs about right and wrong. If it were, then it would seem to imply that we should also reject all our mathematical judgments as well as those pertaining to what we see, since all those judgments have also come by way of faculties that were forged by natural selection. What this evolutionary argument does say is that while our beliefs regarding science and mathematics are open to some kind of verification, our moral beliefs are not. But if there is no way of verifying our moral beliefs—so the argument goes—then there seems to be no justification for asserting the truth of moral claims like "Stealing is wrong." Given the evolutionary account of morality under consideration, we can understand why we have such strong beliefs about morality—to the extent that some moral claims, such as "Killing an innocent person is wrong," seem self-evident—even though we seem to be without any means for confirming them. The intuition that moral facts exist seems to be the

1. I am simply assuming here that external objects exist. Hence, I am leaving aside skeptical epistemological arguments to the contrary.

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only evidence in favor of moral realism, and this evolutionary account suggests that we ought to refrain from putting any emphasis on this intuition. After all, if Ruse is correct, then we would have the same moral intuitions even if there were no moral facts of the sort that could ground moral realism.[2] Under this account, therefore, our tendency to believe that we perceive moral facts should not count as evidence that such facts actually exist. A legitimate justification of our moral beliefs requires some evidence more than the mere feeling that moral facts exist. Unfortunately for the moral realist, such evidence seems unavailable.

2.2. Support for the Evolutionary Account of Morality. The Ruse-Wilson argument maintains that an antirealist stance toward morality is warranted because our moral beliefs are evolutionary adaptations that are not subject to verification. In response to this line of argument, one might demand some justification for the view that our propensity to make moral judgments is an evolutionary adaptation. While a robust defense of this view is beyond the scope of this paper, I will take a somewhat cursory look at some of the evidence that makes this position compelling.[3] On the one hand, there is the evidence provided by Sarah Brosnan and Frans de Waal's primate studies of 2003 indicating that our primate relatives possess a rudimentary concept of fairness. This is significant, because the notion of fairness is a basic element of human moral attitudes. In Brosnan and de Waal's study, capuchin monkeys were allowed to trade tokens for food. When a monkey was given a food item (e.g., a cucumber) that was deemed to be inferior to the food item (e.g., a grape) that another monkey received in exchange for the same token, the monkey being offered the "inferior" item would either refuse to accept it or, in some cases, hurl it in disgust back at the researcher. Drawing from these studies, Brosnan concluded that "notions of justice extend beyond humans" (quoted in Whitfield 2003) and, in addition, that "it looks like this behavior is evolved. . . . It is not simply a cultural construct" (quoted in Markey 2003).

A plausible evolutionary account of morality has been put forth by Michael Ruse, who believes that our tendency to believe in moral truths is an adaptation that was necessary to enable us to act quickly in overcoming the selfish impulses that impede cooperation. According to Ruse, human brains are "hardwired" for morality in the same way that some

2. In the discussion that follows, I will be using the terms 'moral truth' and 'moral facts' interchangeably in referring to those facts that if existent would make moral realism true.

3. For a more comprehensive account seeking to explain the evolution of moral behavior, see Sober and Wilson 1998.

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computers are hardwired to play chess (Ruse 1995a). If this view is correct, then we should expect that moral judgments are more the result of automatic processes than rational deliberation. As it turns out, a growing collection of empirical support for this view has made it increasingly popular among neuroscientists. According to the "social intuitionist model" of moral judgment—as this view is called—the majority, if not the whole, of our moral judgments are the result of automatic intuitive responses to stimuli. Reasoning, apparently, comes into play only after a moral judgment is made, serving to construct an ad hoc justification for the decision that was reached.

One source of support for the social intuitionist model derives from studies in which individuals were unable to provide a legitimate rationale for their moral judgments in particular cases. In one such case involving a fictitious story of consensual incest among adults, subjects stuck by their initial conclusion that the agents in the case acted immorally despite their awareness that they were unable to offer a sound justification for their judgment. After failing in their attempts to provide a rational explanation for why the individuals in the case acted immorally, subjects ended up relying on explanations like "It's just wrong" (Haidt 2001, 814). Proponents of the social intuitionist model argue that if moral judgments result from reasoning, then we should expect subjects to retract their initial judgments upon becoming aware that their initial justifications for those judgments are without merit. The fact that they do not retract them is evidence that the moral judgment is the result of an emotive, intuitive process rather than a function of deliberation. Viewed in light of the social intuitionist model, these types of moral judgments appear to be unconscious in the sense that reasoning seems to play no role whatsoever in producing them. Such evidence lends credibility to the evolutionary account of morality put forth by Ruse.

3. Toward a More Pragmatic Ethics. Despite the difficulties that the evolutionary account of our moral beliefs poses for those who would defend moral realism, it would be a mistake to view these difficulties as providing a reason for rejecting the study of ethics altogether. The fact that an empirically supported evolutionary account of morality poses difficulties for moral realism merely shows that it may be wise for ethicists to move their focus away from defending theories of moral realism. To reiterate, my goal here is not to argue that moral antirealism is correct, and I am certainly not suggesting that ethicists dispense entirely with studying those branches of ethics that assume the existence of moral truths. What I am recommending is that ethicists place more emphasis on the more practical issues within ethics (e.g., how to improve relations among people) that have interested philosophers since antiquity in order to avoid becoming irrelevant in the face of increasing scientific support for moral antirealism. In what

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follows, I discuss how evolutionary theory and psychology provide a particular account of human nature that provides direction for the kind of pragmatic approach to ethics that I am recommending. Of particular importance here is the issue of how altruism evolved in human beings.

3.1. Strong versus Weak Altruism. Since "altruism" in the evolutionary sense is defined as any behavior that reduces its performer's fitness relative to the fitness of others, one can understand the difficulties faced by those who have attempted to explain how altruism could have evolved. As Elliott Sober and David Sloan Wilson put it, "Altruism is the very opposite of the survival of the fittest" (1998, 19). A popular approach to the "problem of altruism" was first put forth by Charles Darwin, who suggested in *The Descent of Man* that altruism might be the result of natural selection operating on the level of groups as opposed to the level of individuals (Darwin 1871, 166). The basic idea behind group selection is that whereas certain traits, such as altruism, are selected against by the forces driving individual selection, these same traits might nonetheless become prevalent due to the fact that they bestow an advantage onto those groups whose members are in possession of them. Given that one accepts the plausibility of group selection, the challenge faced by those who would use it as the basis of an evolutionary account of altruism is to explain how altruism could persist in the face of the individual selection forces opposing it.

While it need not be the case that a group-beneficial trait must be selected against on the level of individuals, the view that such traits are opposed by individual selection seems to be an operating assumption of virtually every evolutionary theorist who has discussed group selection. This assumption has led many to question whether group selection can be a significant force in nature. One of the more influential arguments against group selection came from John Maynard Smith (1964), who used his famous "Haystack model" to determine the circumstances under which group selection could give rise to altruism. He concluded that while it may be possible for altruism to flourish via group selection, the conditions under which this could be expected to occur would be extremely unlikely. Maynard Smith's arguments were a key factor in the widespread dismissal, beginning in the 1960s, of group selection as a potent force of evolution.

A major problem with the Haystack model is that it employs the unnecessarily strong assumption that altruists will always behave altruistically. I will use the term 'strong altruism' in referring to the tendency to act altruistically whenever the opportunity presents itself. The impact that this assumption has had on evolutionary debates about altruism is hard to overstate. For one thing, it has been adopted by the majority of accounts that seek to explain how altruism might evolve. A question worth asking at this point is, why should we bother taking up the project of explaining

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how strong altruism can evolve? Despite the prevalence of strong altruism in the evolutionary literature, one might legitimately question why providing an adequate account of how altruism evolved requires providing a convincing evolutionary explanation for strong altruism, given that it has such powerful forces working against it. Might it be possible instead to develop a satisfactory evolutionary account of altruism by explaining how nature can select for a type of weak altruism? By 'weak altruism', I mean a kind of altruism whereby one's propensity toward altruistic behavior is less than it is in the strong form of altruism that dominates discussions in the evolutionary literature. A weak altruist is one who exhibits some tendency toward altruistic behavior but not as unconditionally as the strong altruist does. To illustrate this difference, imagine an individual whose motivation to engage in altruistic behavior corresponds to the degree to which she has secured her own fitness needs. The more her fitness needs (survival, safety, etc.) are met, the more likely she is to behave altruistically. Call this individual a 'fitness-relative altruist'. Since one's overall fitness is usually contingent on the fitness of others in one's group—due to competition for resources, mates, and so forth—let us assume, for the sake of simplicity, that surpassing the median fitness level in one's group is both a necessary and a sufficient condition for the fitness-relative altruist to behave altruistically.

Appealing to the kind of weak altruism exhibited by the fitness-relative altruist makes it possible to develop an evolutionary account of altruism that avoids many of the pitfalls that traditional accounts have encountered. Most important, it is less vulnerable to the forces driving individual selection than strong altruism is. To see why, consider how the fitness-relative altruist and the strong altruist would fare in a population of nonaltruists when forced to play multiple rounds of the so-called Prisoner's Dilemma. In this two-person game-theoretic model, players are given a payoff (or lack of one) that is determined by how each player behaved in a given round. There are four possible outcomes that correspond to whether each player acted altruistically or selfishly. From player A's point of view, these possible outcomes, from the most optimal to the least optimal, are as follows:

1. Player A behaves selfishly; player B behaves altruistically.
2. Player A behaves altruistically; player B behaves altruistically.
3. Player A behaves selfishly; player B behaves selfishly.
4. Player A behaves altruistically; player B behaves selfishly.

Given the earlier stipulation that the fitness-relative altruist will behave altruistically if and only if she has surpassed the median fitness level of her group, the fitness-relative altruist will do far better than the strong altruist when confronted with Prisoner's Dilemma–like scenarios in a population of nonaltruists. This is due to the fact that while the strong altruist

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will continue to get exploited at the hands of nonaltruists, the fitness-relative altruist will cease to be exploited once her fitness level matches the median fitness level of her group. Once her fitness level matches the median, she will continue to defect unless her fitness level somehow surpasses the median level of the group. What this shows is that the selection forces working against the fitness-relative altruist are less potent than those confronting the strong altruist. Hence, once one abandons the project of explaining how strong altruism could have evolved in favor of explaining how a weaker type of altruism—such as fitness-relative altruism—could have evolved, the task of providing a plausible evolutionary account of altruism becomes significantly easier.

A major reason for appealing to fitness-relative altruism in order to explain the evolution of altruism is that this kind of altruism more accurately reflects much of the actual cooperative behavior that we see in nature. In regard to human beings, for example, research shows that the tendency to behave cooperatively is heavily influenced by factors that impact individual fitness. For instance, there have been a number of studies demonstrating a positive correlation between self-esteem (a key indicator of relative social standing and, hence, of personal fitness) and the propensity to behave cooperatively (see Midlarsky 1971; Isen, Horn, and Rosenhan 1973; Crandall 1978; Weyant 1978; Batson 1990). Inasmuch as evolutionary theorists are concerned with explaining the kind of altruism exhibited by actual human beings, therefore, it seems proper to abandon the effort to provide a plausible evolutionary account of strong altruism because this type of altruism does not resemble actual human cooperative behavior.

3.2. Evolution and the Future of Ethics. Given that human beings have evolved to be fitness-relative altruists, a particular picture of human nature emerges—namely, that a person's propensity to behave cooperatively is positively correlated with the degree to which that individual is able to maintain a positive affective state. This makes sense from an evolutionary standpoint: positive affective states such as happiness and contentment are reliable indicators that one has met basic survival and social needs and is, therefore, better able to withstand the blow to personal fitness that results from behaving altruistically than is someone who has not met such needs. Numerous empirical studies have established the tight relationship between affective state and cooperative behavior. Psychologists Bert Moore and Alice Isen sum up the relevant literature on the subject by concluding that "in the main, happiness promotes altruism, helpfulness, sharing, and sociability, while sadness retards them" (1990, 18). This being the case, ethicists concerned about promoting cooperative behavior among humans would be well served by increasing their efforts to understand the nature of positive

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affective states. The idea that ethicists should explore this terrain would hold even if there were no reason for doubting moral realism. In light of the substantial reasons for doubting the existence of moral facts, however, there is all the more reason for ethicists to turn their attention to understanding the science behind positive affective states. After all, improving our knowledge in this area may allow us to increase cooperative behavior without having to appeal to moral reasons. A recent movement in psychology called "positive psychology" may prove useful to this end. Whereas traditional psychology tends to focus on psychological illnesses, positive psychologists are more interested in understanding the nature of positive psychological states such as happiness and self-esteem. Should positive psychology succeed in significantly furthering our understanding of positive affective states, it may thereby provide us with the means to dramatically increase cooperative behavior.

Understanding the factors that influence positive affective states in human beings is yet another area in which evolutionary theory can be of use to ethicists. In particular, evolutionary theory may be crucial in helping to identify certain human tendencies that are averse to achieving positive affective states. Jealousy, xenophobia, and the inclination to use social comparison information as the basis for our opinions of ourselves are but a few of the traits we have inherited from our evolutionary forebears that detract from our psychological well-being.[4] The fact that such characteristics are a part of our evolutionary heritage indicates that there are powerful psychological mechanisms driving these tendencies that are difficult to overcome. It is important to recognize, however, that these innate tendencies are heavily influenced by environment. The upshot is that for those who are interested in increasing cooperative behavior in society (e.g., public policy makers), evolutionary theory is useful in that it highlights the importance of fostering an environment that is less likely to trigger the kinds of responses that result in negative affective states. For instance, a society in which individuals are socialized to derive their self-concepts through internal considerations ("Did I try my best?") rather than external ones ("Am I better than Sue?") might significantly reduce the tendency to compare oneself to others. This is but one way in which understanding

4. The tendency to base one's self-image on social comparison information was evolutionarily advantageous because it gave rise to the desire to achieve a higher social status than one's peers'. This, in turn, improved our ancestors' opportunities for resource acquisition and sex—both of which tended to improve relative fitness. Despite its evolutionary advantages, however, the tendency to use social comparison information as the basis of one's opinion of oneself is among the more self-destructive tendencies we have in terms of happiness. There are a number of empirical studies indicating that the tendency to use social comparison information is strongly correlated with negative mood states (Weyment and Taylor 1995; Lyubomirsky and Ross 1997).

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the evolutionary origins of certain human dispositions can aid us in creating a happier—and, hence, more cooperative—society.

To sum up, there are at least three ways that evolutionary theory can inform ethics. First, it provides an account of our moral judgments that undercuts moral realism. Second, it contributes to the practical side of ethics by suggesting that we can promote cooperative behavior by increasing the frequency of positive affective states. Third, it hints at how we might actually succeed in promoting positive affective states. Assuming that evolutionary theory has these implications, it would hold the somewhat ironic position of being indispensable both for providing a devastating case against moral realism and for bringing about the kinds of behavior that theories of moral realism emphasize.

REFERENCES

Batson, C. Daniel (1990), "Affect and Altruism", in Bert S. Moore and Alice M. Isen (eds.), *Affect and Social Behavior*. Cambridge: Cambridge University Press, 89–125.

Brosnan, Sarah F., and Frans B. M. de Waal (2003), "Monkeys Reject Unequal Pay", *Nature* 425: 297–299.

Crandall, James E. (1978), "Effects of Threat and Failure on Concern for Others", *Journal of Research in Personality* 12: 350–360.

Darwin, Charles (1871), *The Descent of Man and Selection in Relation to Sex*. London: Murray.

de Waal, Frans (2006), *Primates and Philosophers: How Morality Evolved*. Princeton, NJ: Princeton University Press.

Ernst, Zachary (2007), "The Liberationists' Attack on Moral Intuitions", *American Philosophical Quarterly* 44 (2): 129–142.

Greene, Joshua (2010), *The Terrible, Horrible, No Good, Very Bad Truth about Morality and What to Do about It*. New York: Penguin, forthcoming.

Haidt, Jonathan (2001), "The Emotional Dog and Its Rational Tail: A Social Intuitionist Approach to Moral Judgment", *Psychological Review* 108 (4): 814–834.

Isen, Alice M., N. Horn, and David L. Rosenhan (1973), "Effects of Success and Failure on Children's Generosity", *Journal of Personality and Social Psychology* 27: 239–247.

Joyce, Richard (2001), *The Myth of Morality*. Cambridge: Cambridge University Press.

Lyubomirsky, Sonja, and Lee Ross (1997), "Hedonic Consequences of Social Comparison: A Contrast of Happy and Unhappy People", *Journal of Personality and Social Psychology* 73: 1141–1157.

Markey, Sean (2003), "Monkeys Show Sense of Fairness, Study Says", *Natural Geographic News* (September 17), http://www.primates.com/monkeys/fairness.html.

Maynard Smith, John (1964), "Group Selection and Kin Selection", *Nature* 201: 1445–1447.

Midlarsky, Elizabeth (1971), "Aiding under Stress: The Effects of Competence, Dependence, Visibility, and Fatalism", *Journal of Personality* 39: 132–149.

Moore, Bert S., and Alice M. Isen (1990), "Affect and Social Behavior", in Bert S. Moore and Alice M. Isen (eds.), *Affect and Social Behavior*. Cambridge: Cambridge University Press, 1–21.

Ruse, Michael (1995a), "Evolution and Ethics: The Sociobiological Approach", in Louis P. Pojman (ed.), *Ethical Theory: Classical and Contemporary Readings*. Belmont, CA: Wadsworth, 91–122.

——— (1995b), *Evolutionary Naturalism*. London: Routledge.

Ruse, Michael, and Edward O. Wilson (1984), "Moral Philosophy as Applied Science", in Elliott Sober (ed.), *Conceptual Issues in Evolutionary Biology*. Cambridge, MA: MIT Press, 555–574.

https://doi.org/10.1086/605810 Published online by Cambridge University Press

Sayre-McCord, Geoffrey (1988), *Essays on Moral Realism*. Ithaca, NY: Cornell University Press.
Sober, Elliott, and David Sloan Wilson (1998), *Unto Others.* Cambridge, MA: Harvard University Press.
Weyant, James M. (1978), "Effects of Mood States, Costs, and Benefits on Helping", *Journal of Personality and Social Psychology* 36: 1169–1176.
Weyment, Heidi, and Shelley Taylor (1995), "Self-Evaluation Processes: Motives, Information Use, and Self-Esteem", *Journal of Personality* 63 (4): 729–757.
Whitfield, John (2003), "Monkeys Strike for Justice", *Nature News* (September 18), http://www.bioedonline.org/news/news.cfm?art=524.
Wilson, Edward O. (1975), *Sociobiology: The New Synthesis*. Cambridge, MA: Harvard University Press.

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