

743. Broom, D.M. 2019. The biological basis for religion and religion's evolutionary origins. In: *The Evolution of Religion, Religiosity and Theology: A Multi-Level and Multi-Disciplinary Approach*, J.R. Feierman and L. Oviedo eds, Chapter 4, 70-83. London: Routledge, doi.org/10.4324/9780429285608, ISBN 9780429285608.

Pre-publication copy

4 The Biological Basis for Religion and Religion's Evolutionary Origins

Donald M Broom

Morality and Its Origins

The main argument presented in this chapter is that morality has been a central part of all of the major doctrinal religions since the Axial Age (800–200 BCE) and that the origins of these religions are closely tied to the evolution of morality. As explained by Broom (2003), there are many biological mechanisms that have evolved as a part of a system with many components for promoting morality and increasing the likelihood that individuals will be religious. Feierman (2009) and authors in this volume describe how a propensity for religion may have evolved. The preferences of individuals for certain stimuli, and several other mechanisms in the brain, tend to increase the chances of having experiences perceived to be religious. Many of these mechanisms promote moral and religious behavior and feelings. The link between moral actions and many religious practices has been key. Characteristics that facilitate religious attitudes may have evolved because they helped to increase moral actions so the effects were advantageous to individuals showing these actions.

It may seem from our observation of the media, and even from reading novels, that people's activity is mainly directed toward promoting themselves at the expense of others, even if the cost to others is high. However, analyses of actions during a lifetime indicate that actions with such consequences are relatively rare (de Waal 1996; Broom 2003). Most actions do not harm others, especially when the others are close by or likely to be encountered frequently. Why do people mainly do what is right rather than what is wrong? Other social animals, especially those that are sentient, do the same. Other predators feed on other living animals, but apart from times when food must be obtained, nature is seldom red in tooth and claw. Most individuals take particular care not to harm other individuals in their group and do not gratuitously harm members of other species.

The idea that most of animal behavior is aggressive, or otherwise competitive, is entirely wrong (de Waal 1996; Broom 2003; Broom and Fraser 2015). Of course, humans and other species do sometimes cause harm to others, and these actions are important in life and well worth studying, but

popular views about behavior that emphasize the occurrence of competition are misleading. Biologically, helping others and not harming others are effective strategies, especially for animals such as humans who live in long-lasting social groups (de Waal 1996; Broom 2003, 2006). Many animals have weapons or body mass that could easily harm group members. Cattle with long horns almost always move carefully in such a way that others are not touched by the horns. Elephants walk around without squashing young elephants or animals of other species. We humans can easily harm others as we move around in our daily life, but we seldom do so.

If social animals harm others, the action is likely to make the society less stable. Harms might reduce the survival chances of kin and could elicit retaliation that could damage the individual both directly and indirectly – indirectly because of a reduction in social group cohesion. Collaboration in various species includes joining others who are likely to have found food; observing others to find food sources or learn how to find or acquire food; collaborating in hunting for, acquiring, handling or defending food or avoiding depleted sources; sharing food; and giving food to others (Broom 1981). As a result of the advantages of harm-avoidance actions, genes that promote avoiding harm or promote cooperation, and hence stabilize societies, confer benefits on their bearers and can spread in populations (Axelrod 1997; Riolo et al. 2001; Broom 2003, 2006).

Morality has a wide variety of biological components and has evolved in animals that live in social groups whose members stay together or return to the group. “Moral” means pertaining to *right* rather than *wrong*. A “religion” is defined as a system of beliefs and rules that individuals revere and respond to in their lives and that are seen as emanating directly or indirectly from some intangible power.

There are several genetic mechanisms encouraging altruism (Lehmann and Keller 2006). There is competition among some genes to continue in the phenotypes of animals, and some of this competition results in altruism. The use of the term “selfish gene” by Richard Dawkins (1976) has been misleading. Genes cannot be selfish, because this is a quality of whole organisms that are aware; only sentient individuals can be selfish (Midgley 1994; Broom 2003, 2006). “Selfish” describes an individual acting in a way that increases its fitness at the expense of the fitness of one or more other individuals while being aware of the likely effects on itself and on the harmed individual or individuals.

Some of the Arguments for the Evolution of Morality

To consider how morality may have evolved in humans and other social animals, it is necessary to explain what people regard as right. Moral ranges from, at one extreme, the profound and life balancing to, at the other extreme, the relatively trivial. For example, what is referred to as true morality here does not include customs or attitudes to sexual behavior

stemming from mate guarding, except indirectly when the action leads to a major harm: human sexual display is not immoral unless it causes real harm. Also, laws may indicate what is morally right but will not necessarily do so when they primarily protect the people and property of the powerful or perpetuate tribal or other customs.

There is a large literature documenting the widespread occurrence of cooperative and altruistic behavior in social animals (de Waal 1996). Reference to altruism does not always mean that it is reciprocal. Reciprocal altruism is important in the evolution of morality but is only a part of the biological basis of morality. As Alexander (1987) said, "Moral systems are systems of indirect reciprocity."

To be able to avoid certain harms, to remember the altruistic or harmful actions of others, to predict future consequences of situations and actions and to take account of all of this information, a level of cognitive ability and awareness is needed. Every year, we have more information about awareness, feelings and cognitive ability in various species of mammals, birds, fish and invertebrate animals (Broom 2014, 2016).

The abilities needed in individuals in order that moral actions can occur (after Broom 2003) are as follows:

- Ability to recognize beneficiaries and benefactors.
- Ability to remember one's own actions and their consequences.
- Ability to assess risk.
- Ability to detect and respond to cheating.
- Desire to conform.
- Affection for certain individuals.
- Ability to feel empathy.

Strategies that involve moral action are likely to be successful in that, on average, individuals using such strategies will have more offspring than those that do not. This is the reason for a number of rules in a wide range of human groups. Human society condemns, albeit to different degrees, those who injure another deliberately, those who cause injury by careless contact with another (such as a push that leads to a head injury) and those who are negligent with the consequence that an injury is caused to another. For example, most people would condemn leaving a large hole in the ground uncovered in the dark or allowing a child access to a deadly weapon. There are also rules relating to the use of important resources. If plentiful quantities of food are only occasionally obtained by individuals in a social group, there is likely to be an expectation within the group that it will be shared when it is found (de Waal 2000). Many rules like these seem to exist in other social species.

If altruism occurs, whether it involves direct cooperation or avoidance of harm, the possibility of cheating is important to take into account. This issue has been discussed by many authors, including Kitcher (1993), Axelrod

(1997) and Riolo and colleagues (2001), who explain that game theory models used in many of the arguments are too simple when the sophisticated intellects of any social vertebrate are considered. To understand how altruistic behavior might have evolved by individual selection, it is necessary to incorporate into modeling some information obtained from studies of real-life situations. Multilevel selection models have also been proposed (Nowak et al. 2010).

As detailed by Broom (2006), the question of whether or not a gene-promoting altruism would spread in a population of social animals by individual selection depends on the detail of the strategy adopted. A gene that only promoted altruism to kin might be out-competed by either a gene that led to the bearer being altruistic except where the bearer's monitoring shows that it is inadvisable because reciprocation is unlikely, or a gene whose bearer is altruistic to kin and also to others if monitoring shows that reciprocation is likely. Another possible strategy would involve being altruistic, with no reciprocation necessary, but with monitoring that allows for recognizing others who bear the same gene or recognizing kin. In addition to all of these possibilities is the risk of cheaters disrupting the social group, with negative consequences for all members, including the cheater.

Sentience and Capacity for Moral Action

Some of the abilities required for moral action are components of sentience. "Sentience" means having the awareness and cognitive ability necessary to have feelings. The current scientific view is that adult vertebrates (mammals, birds, reptiles, amphibians, fish), cephalopod mollusks and decapod crustaceans are sentient. Other animals may be added to this list in future as we find out more about animal abilities. Sentience arises, in humans and other animals, at a certain stage of individual development and may be lost when there are some kinds of brain damage (Broom 2014). The advantages for socially living animals of being able to work together with other individuals have favored the evolution of sentience and the development of more and more sophisticated cognitive function.

The concept of sentience has close parallels with those of the psyche and the soul. Sentience involves: having your own feelings, understanding the functioning of others, having awareness that others have feelings and having empathy for others. These are also central parts of the idea of a soul. "Psyche" is a Greek word, often translated as soul. It implies that what is directly perceived is interpreted according to the awareness that an individual has of a wide range of other aspects of life.

Empathy, Moral Value and God

The concept of empathy is a key aspect of moral and religious decisions and behavior and was defined and discussed by Broom (2003). Empathy is the

process of understanding the experience of another individual, cognitively and emotionally. This is different from compassion which is pity that results in sparing or caring for another individual. Where there is communication among individuals, especially those that frequently meet, there is a greater likelihood that there will be feelings of empathy. If there is empathy, then the more communication, the more empathy. The various aspects of empathy are considered to occur in a range of animal species, not just in humans (Preston and de Waal 2002).

Moral behavior depends on the ability of one individual to appreciate the state of other individuals. Moral decisions by an individual rely greatly on evaluation of the feelings of others. Empathy is a particularly important part of these mechanisms. We know that many aspects of human morality have equivalents in the societies of other animals and also that many nonhumans show empathy for people or other animals with problems. We recognize empathy from behavior, in the same way that we do for humans. If individuals are aware of the empathy of others, their behavior changes and there is a bond between those individuals. Those bonds are, in turn, perceived by others in a society or small group where there is empathy. There is often much overlapping of groups and hence a cross-group awareness of empathy. Where many individuals have empathetic feelings, and there is evidence from their actions that they have such feelings, their further actions and beliefs can be affected by this commonality of empathy. The changes in behavior and an understanding of the causation of this change may result in local or widespread communication of common empathy. The links resulting from the empathetic feelings in communities of various sizes, including the world as a whole, can be thought of as a common spirit.

The spirit need not be considered to be a tangible entity, and some of the empathy may be for only a narrow range of individuals, but the collection of empathetic feelings is something broader than the properties of the individuals. Exercising empathy for all humans, or for all sentient beings, is often encouraged. Individual human actions do not occur in isolation: the spirit adds to the complexity of a group of individuals and has an impact on many actions. This spirit need not be physically identifiable but is of great importance to humans and other sentient beings and can be thought of as an essential part of the concept of God. The idea of God as a spirit linking sentient beings (Broom 2003) fits with the view that group empathy is a major factor underlying moral codes. The empathy and respect felt by individuals toward other individuals is a link with that common spirit. The idea of a common good for every group, ranging from small groups to all sentient beings, and of something greater than the individual – a common spirit, a god or gods – helps moral systems to function.

Many philosophers refer to humans and other sentient beings as moral agents: They can be the subject of moral actions and have moral value. The question of who has or what other animals have moral value is important

in decisions about how to treat others, human or nonhuman. Gert (1988) states that an act is morally relevant if it is done to “existing or potential sentient beings.”

Rolston (1999) does not think of nonhumans as moral agents. Rottschaefer (1998) refers to considering “ourselves” as moral agents, but in doing so, nonhumans are not excluded from “ourselves” and hence could be considered moral agents. There are so many examples of nonhuman animals, especially those living socially, avoiding harming others or acting in ways that directly benefit others (Broom 2003) that it seems illogical to say that the individuals concerned are not moral agents. Whether or not nonhumans are thought of as being moral agents, they can be the subject of moral actions and so have moral value.

Obligations or Rights?

How should we describe what should or should not be done to other individuals? I believe that we should describe the obligations of the actor rather than the rights of the subject. Although consideration of human rights has resulted in some good being done, assertions of rights and freedoms can cause problems (Broom 2003). Examples include a person asserting that they have a right to carry a gun at all times, determine the sex of their offspring or have the freedom to speak in public in such a way as to encourage the persecution of groups of people.

One obligation is not to harm others except in self-defense. An aspect of this is to avoid killing, or at least to avoid killing for no good reason. Another is to insist that human systems be sustainable. Unsustainable may be unacceptable to the general public because of harms to the people involved in production, harms to other people, harms to other animals in that their welfare is poor or harms to the environment (Broom et al. 2013; Broom 2014; Broom and Fraser 2015). If we keep or otherwise interact with animals, then we have obligations in relation to their welfare. “The welfare of an individual is its state as regards its attempts to cope with its environment” (Broom 1986). We need to consider to which people and which nonhuman animals we have moral obligations. Also, which are moral agents, and what is our level of obligation? With increased knowledge of the functioning of humans and of nonhuman animals, more kinds of humans and more kinds of nonhuman animals are now included as “us” when moral obligations are considered (Broom 2003, 2014).

The Moral Core of Religion

Helping others, even those not part of our local group, and not causing harm are central messages in the more mature writings in all long-lasting religions (Broom 2003), even if it is absent in some of the earlier religions. Long-lasting refers to religions that have continued for thousands of years up to

the present. Of course, not all individuals avoid harming others, and there are many examples of religious adherents harming those from other sects or tribes but the wrongness of such harm, unless in self-defense, is widely taught. For example, the Good Samaritan who aids another who might have been thought of as not being “one of us” is considered an important exemplar in Christian teaching, and there are parallels in the teachings and codes of conduct of other religions. Whether or not the person who helps is acting in order to gain religious credit, the action of helping is a good action and is perceived as such by the majority of people. Other religious images and symbols are easier to understand if the biological basis of morality and religions is carefully considered (Broom 2007): e.g., an image of a mother cow caring for a calf as a symbol of goodness or an image of a frightening vengeful god as a deterrent to antisocial behavior. The general message presented in the next part of this chapter is that religions are inevitable, and useful, in long-lasting societies. However, as explained later on, the conclusion that religions are useful does not imply that all their aspects are good. Religions need to change in some respects as knowledge progresses.

Although there have been religions that attracted followers and had only self-seeking rules, all of the long-lasting religions of the world that still exist today have a moral code that is central to their functioning. A survey of religions by Whitehouse and colleagues (2019) found that social complexity preceded the reference to what the authors call moralizing gods in a wide range of human societies. Today, most of the differences among religions are in peripheral aspects, including historical descriptions, specific rituals and tribal components. Some of the rules may have had the effect of defending the local tribe or promoting male dominance, but other rules had morally positive consequences. The rituals that are a part of a religion often have the valuable effect of encouraging people to identify with the religious group and to follow the code of that group. In the Whitehouse and colleagues study, rituals that might facilitate the standardization of religious traditions appeared before the advent of moralizing gods. These findings do not mean that the moral structure was not present in the early stages of the religion but rather that the concept of a remote, supernatural moralizing god developed after the society became large.

Some rituals have positive or negative moral consequences. Each major religion has canonical texts, usually put together in one or more books. Holy books are a source of information about what is moral, but they also include history and some statements of a tribal nature that may be far from moral. The term “tribal” here implies helping the immediately identified group, whether or not the action is universally moral. The group can be one in modern society, and “tribal” is not intended to imply that the society is primitive or physically remote from other people. At their best, tribal actions preserve useful or aesthetically important culture, but at their worst, they harm individuals in other groups for reasons other than self-defense. Ultimately, harmful actions like the latter tend to destabilize larger societies and

sometimes lead to the destruction of some or all in the group that is behaving immorally. The key to understanding the value of religions involves distinguishing the fundamental messages in the religion about morality, and about how best to organize a society, from the tribal and sometimes harmful components.

Some early religions, and religions in rather isolated communities, had a plethora of gods with dubious attributes. However, widespread and successful religions have a guide to behavior, which is part of a code for how each individual should live, and a system for discouraging cheats or those who harm others. Commandments include, in Buddhism, “ahimsa,” referring to non-injury to others; in Hinduism, the books of Manu, which lay out duties; in Confucianism, the idea that humans have a moral sense, the sensibility of the *hsin*; in Christianity and Judaism, the Ten Commandments and an imperative to love your neighbor as yourself, where “neighbor” is now widely interpreted as including all others; and in Islam, acts known to Allah, who rewards and punishes according to morality, though “other” is sometimes limited to “people of the book,” meaning the three Abrahamic faiths. Much wording of the holy books is similar in all of these religions.

There are many other important tenets and traits that religions have in common (Whitehouse 2008). The idea of prayers, be they individual or communal, said or thought, is regarded as important in many religions. Prayers are difficult to study directly because most people regard them as personal and private. Attempts have been made by Geertz and colleagues (Schjoedt et al. 2009), who used fMRI imaging of the brain to explain some of the correlates of prayers. The effect of prayers on individuals has often been reported to be positive: social cohesion and deliberate contemplation of important issues in life being among possible beneficial components. Particular buildings are deemed to be sacred, certain people promote feelings of belonging to a group and there may be the concept that an ideal state exists with continuation of individuals after death because of group membership and good behavior.

Views of Humankind and Other Sentient Beings in Religions

In some religions, as in many other aspects of life, people are told or develop the belief that humankind is special. Of course, every kind of organisms is different from all others, but a high proportion of humans have the idea that our species is more important than any others and that we, as humans, have priority when the use of world resources is under consideration. The idea of a pyramid with humankind at the top is still used by many religious teachers.

We know now, in much more detail than was possible when the current doctrinal religions were being developed, that humans have differences from other animal species but also share characteristics with many organisms and where different are frequently not better. Humans have many genes in common

with other species, many similarities in phenotype with other species and few characteristics that are not shared with some other animals. Many people who were part of monotheistic religions and who had the view of humans as special in some way rejected evidence for human origins from other animals. Some found the idea of evolution attractive because of the pyramid. Darwin (1872) drew attention to the similarities between humans and other animals. Buddhist, Taoist, Hindu and Jain views of humankind and other animals as parts of a larger community of value led to the rejection of the pyramid idea.

It is written in the book of Genesis that God gave us dominion over the living things in the world, but who are “us” and what should dominion mean? The actual reference is to Adam and Eve and their descendants, but “us” could be interpreted as being wider than humans and including other sentient beings with a capability to be responsible in their actions. As many authors have said, dominion can mean acting in a caring and responsible way, being a steward of the world, rather than dominating and exploiting without consideration for present or future harms that are caused. For example, dominion should not mean eliminating large numbers of animals and plants and encouraging unsustainable and immoral actions.

The statement in the Bible that humankind was made in the image of God led many Christians to think of a physical, mainly visual image. While many people, including artists whose works were widely seen, thought in this way, some religious teachers had a subtler view. At the time of the production of the Hebrew Bible, an important point that was being made was that all people, rather than just rulers, shared qualities with God. However, if the idea of God is largely visual, God is considered by many people to visually resemble humankind. Like many scholars from the past, I argue that a more logical meaning of these words in the Bible is that the image is a moral image. In that case, one consequence is that humans, and other sentient beings, can aspire to a complete level of morality. The strategy of minimizing or avoiding harm to others works better than other strategies, such as to show frequent acts of aggression that are not self-defense. Since moral behavior is biologically and socially the most successful strategy in all communities, the teaching that humans can have a moral image of God, and can try to be like God in a moral way, is helpful.

Why Religions Arise

In addition to the world’s major long-lasting religions, there are more ephemeral religions and many other sets of beliefs relevant to conduct that may or may not be called a religion. Religions centered on a moral system are likely to arise in all long-lasting societies (Broom 2003). This structure encourages the avoidance of harms, the promotion of cooperation and the detection and discouragement of cheating. The moral code may coincide with a legal structure but sometimes does not, since laws may just protect the rich. Religions can “define groups, coordinate behavior within the group and

solve the all-important problem of cheating” (Wilson 2008). They can also encourage signals of commitment to the group and hence promote group cohesion (Irons 2008). The group considered might start as just a local community but then expand to include all people in a region, all of humanity or all sentient beings (Broom 2003). The propensity for religion has always been widespread in human societies and to some degree in other species. When there are reforms to religions, the change is often a response to moral inadequacy in the religion’s organization. As Richerson and Newson (2008) point out, Calvin’s reforms to the Catholic Church were a response to corruption in its hierarchy. Muhammad’s religiously inspired code for living was aimed at regulating inter-tribal anarchy. At more local levels, Balinese water temples organized water supply and water use in rice fields.

Genetics affects the structure for morality and religion, but no mechanism is genetically determined. It has long been emphasized by behavioral biologists that all characteristics of animals, behavioral or otherwise, are affected by both the genome and the environment (Broom 1981). Indeed, a wide range of recent studies make it clear that environmental factors play a part at every stage in the translation of genetic information to produce a phenotype (Alexander 2017). As a consequence, no characteristic is instinctive, innate or determined, where these qualifications imply being uninfluenced by environmental effects. No individual is hardwired to have a particular belief independent of environmental experience, and genes that promote moral and religious behavior do not make such behavior inevitable. Heritability of religiousness does not mean genetic control of the belief or action. Genetic and environmental information must always be involved, so cultural evolution cannot fully explain why religions arise.

The biological mechanisms that promote morality and religion include some simpler perceptual and some complex cognitive and emotional components. (Taves 2009) described some religious experiences and commented on their possible physiological origins, and Feierman (2016) analyzed the nature of belief. Bulbulia (2004) explained some of the effects of religious rituals, and Cohen (2007) described reports of body possession by spirits. Some of the rituals and other practices carried out over the course of religious events may serve to impress the individual concerned and other individuals. Costly practices have impact because they are evaluated as a handicap impeding normal activity in humans and other species, and these costly practices may become more and more exaggerated in religions as time progresses (Zahavi and Zahavi 1997; Slone 2008). One example described firewalking as part of a religion and proposed that such actions promote prosociality (Xygalatas et al. 2013).

A practical aspect of a long-lasting doctrinal religion is to enforce compliance with its moral code, such as by issuing threats, illustrating good behavior with personal examples (e.g., in the case of Jain renouncers (Wilson 2008)), ostracizing transgressors or excluding from the group those who do not behave in a moral way.

Ideas about the Value of Religion

Since moral behavior is adaptive and promotes stability in societies, the religious framework that governs such moral behavior is valuable in those societies. It makes life easier for the average person and increases the likelihood that potential transgressors of moral codes will understand what should and should not be done.

The advance of knowledge helps to dispel groundless fears and to focus on what is really dangerous in life. Fear of dragons, for example, is not helpful if there are no dragons, but fear that minimizes contact with pathogens is valuable and is likely to continue to be promoted in societies because it reduces the risk of disease. Accurate risk assessment is important, so with the increase in awareness of it, more and more people are coming to understand how to plan their lives. Fear of being mugged can cause poor welfare in people. However, in many human societies where the risk of mugging is low, such fear should not be exaggerated. Similarly, some people have fear of traveling by aircraft. The risk per journey is low, so the fear is unreasonable, especially in people who regularly travel by motor car, a much more dangerous activity. Some partly irrational fears are starting to be identified as risk assessment incompetence.

Just as knowledge about risk assessment helps us to manage our lives, knowledge about evolution helps us to understand and value religion and should not be considered contrary to religious teaching. Some of what is taught in religions is now archaic and should be updated as relevant knowledge progresses. If this is not done, people at present and in future will be less likely to accept the religion and will lose the benefits that it could provide them. For example, the negative attitudes of some Christians and Muslims to evolution by natural selection are causing much damage to both religions, in my view. Those who deny that evolution occurs may propose that the high level of complexity of the biological and physical world is evidence for creation. Since there are many other possible causes of complexity, in my opinion scientists and most other people in the world do not accept their argument. The concept of God presented here is not contradicted by an understanding of evolution. The idea that there is something more than just individuals, a spirit that is something linking individuals, would have been promoted by some evolutionary changes. Because of the advantages of religious belief, natural selection may have increased the likelihood of brain characteristics that promote belief occurring in populations. The wide concept of belief is relevant to many animal species.

Many atrocities have been committed in the name of religion. However, there are important differences between tribalism, which here refers to helping the immediately identified group to defend property and land, and actions following the key teaching of the religion, which is to behave in a moral way.

The view of God as a spirit linking sentient beings does not require that God be responsible for the physical world. I see no reason to include the

creation of the universe, or of other physical objects or actions such as lightning strikes, as being done by God. The story written in Genesis around 2,500 years ago was an attempt to explain unknown phenomena, and such attempts exist in the stories and writings of other religions. We now have much more information about the world in which we live. The view proposed here makes it much easier for religious teaching to be reconciled with discoveries about matter and with facts about astrophysics, as such facts do not have to be seen as depending on religious teaching. Neither does religious teaching have to explain all phenomena.

Those who do not find religion useful say that too much of religion is irrational and conflicts with current knowledge. In reality, hardly anyone who is part of a religion, including most priests, imams and so on, believes all of what is written in holy books or said in religious services. If the writings and practices and at least some of the teaching were updated to take account of current knowledge, many of such misunderstandings could be avoided. The important central tenets of the major religions are helpful to many people. Hence, any person can be involved in a religion to a greater or lesser degree without having to accept all of what is written or said on behalf of that religion. Some religious groups argue that every word of a holy text must be accepted to be part of the group. Such an attitude harms their religion. Religions that do not change to take account of new information are unlikely to persist for long. As in all aspects of life, people can select what they believe without worrying about what is, or is not, a delusion (Dawkins 2008). Religion's value is what religion does – that is, its function for each person – irrespective of the truth of individual components or propositions associated with that religion.

Does a Moral Core of Religion Mean That All Morality Is Religious?

The argument that moral structures are biologically sound strategies in long-lasting social groups implies that some degree of moral behavior will occur in all such groups, so morality is not confined to groups with a religion. However, religion tends to strengthen the structure in various ways. This makes the social group more cohesive and likely to be perpetuated. If the religion emphasizes tribal, in-group-promoting aspects more than moral values, it is not likely to survive for a long time in a changing society.

In societies where, as often happens, religions have failed to change fast enough to incorporate new knowledge, some members of the society may reject the religion or at least not directly practice any facet of it. In this circumstance, the moral teaching of the religion is likely to survive and be influential in the society in people who no longer practice the religion. People who claim to have nothing to do with a religion are still likely to be much influenced by the moral codes. As a consequence, people behave in a moral way for several generations after the decline in participation in religious activities.

Conclusions

- Morality has a wide variety of biological components and has evolved in humans and other animals that live in social groups whose members stay together.
- Ethical questions include the welfare of animals and other sustainability issues.
- Whether or not nonhuman animals are thought of as being moral agents, they can be the subject of moral actions and so have moral value.
- Some of the qualities required to show moral behavior are also aspects of sentience.
- The concept of sentience has close parallels with those of psyche and soul.
- Contrary to the teachings of some religions, humans are animals, are similar to other animals and are not “special” in the sense of being more important.
- Modern doctrinal religions are a development of having a sophisticated moral code and are a structure to support it.
- All modern doctrinal religions have a moral code with a list of things to do or not do as a central aspect.
- Widespread empathy can be the basis for the concept of a spirit linking all sentient beings.
- We all have obligations, and we should describe the obligations of the actor rather than the rights of the actor. Arguments based on rights or on freedoms to act have sometimes been useful but can cause problems.
- Arguments that religion is a bad thing and that God is a delusion (Dawkins 2008) involve a misunderstanding of how natural selection has acted and are damaging to human societies.

References

- Alexander, D. 2017. *Genes, Determinism and God*. Cambridge: Cambridge University Press.
- Alexander, RD. 1987. *The Biology of Moral Systems*. New York: Aldine de Gruyter.
- Axelrod, R. 1997. *The Complexity of Cooperation*. Princeton: Princeton University Press.
- Broom, DM. 1981. *Biology of Behaviour*. Cambridge: Cambridge University Press, 320.
- Broom, DM 1986. “Indicators of Poor Welfare.” *British Veterinary Journal* 142: 524–526.
- Broom, DM. 2003. *The Evolution of Morality and Religion*. Cambridge: Cambridge University Press.
- Broom, DM. 2006. “The Evolution of Morality.” *Applied Animal Behaviour Science* 100: 20–28.
- Broom, DM. 2007. “Images and the Biological Origins of Religion.” In: *Image and Imagination: A Global Prehistory of Figurative Representation*, ed. by C Renfrew and I Morley, 333–336. McDonald Institute Monographs. Cambridge: Cambridge University Press.

- Broom, DM. 2013. "The Welfare of Invertebrate Animals Such as Insects, Spiders, Snails and Worms." In *Animal Suffering: From Science to Law, International Symposium*, ed. by TA van der Kemp and M Lachance, 135–152. Paris: Éditions Yvon Blais.
- Broom, DM. 2014. *Sentience and Animal Welfare*. Wallingford, UK: CABI, 200.
- Broom, DM. 2016. "Fish Brains and Behaviour Indicate Capacity for Feeling Pain." *Animal Sentience* 2016.010: 5 pages.
- Broom, DM, and AF Fraser. 2015. *Domestic Animal Behaviour and Welfare*, 5th ed. Wallingford, UK: CABI.
- Broom, DM, FA Galindo and E Murgueitio. 2013. "Sustainable, Efficient Livestock Production with High Biodiversity and Good Welfare for Animals." *Proceedings of the Royal Society B* 280: 20132025.
- Bulbulia, J. 2004. "Religious Costs as Adaptations that Signal Altruistic Intention." *Evolution and Cognition* 10: 19–38.
- Cohen, E. 2007. *The Mind Possessed: The Cognition of Spirit Possession in an Afro-Brazilian Religious Tradition*. Oxford: Oxford University Press.
- Darwin, C. 1872. *The Expression of the Emotions in Man and Animals*. London: John Murray.
- Dawkins, R. 1976. *The Selfish Gene*. Oxford: Oxford University Press.
- Dawkins, R. 2008. *The God Delusion*. Wilmington, MA: Mariner Books.
- de Waal, F. 1996. *Good Natured*. Cambridge, MA: Harvard University Press.
- De Waal, F. 2000. "Attitudinal Reciprocity in Food Sharing among Brown Capuchin Monkeys." *Animal Behaviour* 60: 253–261.
- Feierman, JR. 2009. "How Some Major Components of Religion Could Have Evolved by Natural Selection." In *The Biological Evolution of Religious Mind and Behavior*, ed. by E Voland and W Schiefenhövel, 51–66. Dordrecht, Heidelberg, and London: Springer.
- Feierman, JR. 2016. "The Biology of Religious Belief, Emotion, and Behavior: A Natural Science Perspective." In *Studies in Science and Theology 15, 2015–2016, Yearbook of the European Society for the Study of Science and Theology*, ed. by D Evers, M Fuller, A Ruhehov and K-W Saether, 41–62. Bamberg, Germany: Rosche-Much Druckerei.
- Gert, B. 1988. *Morality: A New Justification of the Moral Rules*. New York: Oxford University Press.
- Irons, W. 2008. "Why People Believe (What Other People See as) Crazy Ideas." In *The Evolution of Religion: Studies, Theories and Critiques*, ed. by J Bulbulia, R Sosis, E Harris, R Genet, C Genet and K Wyman, 51–57. Santa Margarita, CA: Collins Foundation Press.
- Kitcher, P. 1993. "The Evolution of Human Altruism." *Journal of Philosophy* 90: 497–516.
- Lehmann, L, and L Keller. 2006. "The Evolution of Cooperation and Altruism: A General Framework and a Classification of Models." *Journal of Evolutionary Biology* 19: 1365–1376.
- Midgley, M. 1994. *The Ethical Primate*. London: Routledge.
- Nowak, MA, CE Tarnita and EO Wilson. 2010. The Evolution of Eusociality. *Nature* 466: 1057–1062.
- Preston, SD, and FBM de Waal. 2002. "The Communication of Emotions and the Possibility of Empathy in Animals." In *Altruistic Love: Science, Philosophy, and Religion in Dialogue*, ed. by S Post, LG Underwood, JP Schloss and WB Hurlburt. Oxford: Oxford University Press.

- Richerson, PJ, and L Newson. 2008. "Is Religion Adaptive? Yes, No, but Mostly We Don't Know." In *The Evolution of Religion: Studies, Theories and Critiques*, ed. by J Bulbulia, R Sosis, E Harris, R Genet, C Genet and K Wyman, 73–78. Santa Margarita, CA: Collins Foundation Press.
- Riolo, RL, MD Cohen and R Axelrod. 2001. "Evolution of Cooperation without Reciprocity." *Nature London* 414: 441–443.
- Rolston, H. 1999. *Genes, Genesis and God: Values and Their Origins in Natural and Human History*. Cambridge: Cambridge University Press.
- Rottschaefer, WA. 1998. *The Biology and Psychology of Moral Agency*. Cambridge: Cambridge University Press.
- Schjoedt, U, H Stødikilde-Jørgensen, AW Geertz and A Roepstorff. 2009. "Highly Religious Participants Recruit Areas of Social Cognition in Personal Prayer." *Social Cognitive and Affective Neuroscience* 4: 199–207.
- Slone, DJ. 2008. "The Attraction of Religion: A Sexual Selectionist Account." In *The Evolution of Religion: Studies, Theories and Critiques*, ed. by J Bulbulia, R Sosis, E Harris, R Genet, C Genet and K Wyman, 181–187. Santa Margarita, CA: Collins Foundation Press.
- Taves, A. 2009. *Religious Experience Reconsidered: A Building Block Approach to the Study of Religion and Other Special Things*. Princeton, NJ: Princeton University Press.
- Whitehouse, H. 2008. "Cognitive Evolution and Religion: Cognition and Religious Evolution." In *The Evolution of Religion: Studies, Theories and Critiques*, ed. by J Bulbulia, R Sosis, E Harris, R Genet, C Genet and K Wyman, 31–41. Santa Margarita, CA: Collins Foundation Press.
- Whitehouse, H, P François, PE Savage, TE Currie, KC Feeney, E Cioni, R Purcell, RM Ross, J Larson, J Baines, B ter Haar, A Covey and P Turchin. 2019. "Complex Societies Precede Moralizing Gods throughout World History." *Nature*. doi: 10.1038/s41586-019-1043-4
- Wilson, DS. 2008. "Evolution and Religion: The Transformation of the Obvious." In *The Evolution of Religion: Studies, Theories and Critiques*, ed. by J Bulbulia, R Sosis, E Harris, R Genet, C Genet and K Wyman, 23–29. Santa Margarita: CA, Collins Foundation Press.
- Xygalatas, D, P Mitkidis, R Fischer, P Reddish, J Skewes, AW Geertz, A Roepstorff and J Bulbulia. 2013. "Extreme Rituals Promote Prosociality." *Psychological Science* 24: 1602–1605.
- Zahavi, A, and A Zahavi. 1997. *The Handicap Principle: A Missing Piece of Darwin's Puzzle*. Oxford: Oxford University Press.