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## Levels of Altruism

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The phenomenon of altruism extends from the biological realm to the human sociocultural realm. This paper sketches a coherent outline of multiple types of altruism of progressively increasing scope that span these two realms and are grounded in an ever-expanding sense of "self." Discussion of this framework notes difficulties associated with altruisms at different levels. It links scientific ideas about the evolution of cooperation and about hierarchical order to perennial philosophical and religious concerns. It offers a conceptual background for inquiry into societal challenges that call for altruistic behavior, especially the challenge of environmental and social sustainability.

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**Key words:** altruism, evolution of cooperation, kin selection, reciprocal altruism, multi-level selection, empathy

## Introduction

This paper takes a broad view of altruism, from its simplest occurrence to its highest manifestation. “Altruism” here means action that benefits others at relative cost to oneself. This definition is especially applicable to the most elementary manifestations of this phenomenon; higher manifestations might simply be called ethical behavior or – focusing on the internal roots of such behavior – “empathy” (Rifkin 2010).

What is proposed here is a hierarchy of types of altruism that involve a progressively expanding sense of “self.” The hierarchy extends from the biological realm to the human sociocultural realm, a transition both continuous and discontinuous. The biological realm extends into the cultural realm, but the latter conditions its influences and introduces new factors that can increase the scope of empathy. In the lower realm, altruism is analyzed by evolutionary theory, where alternative ideas such as kin selection, reciprocal altruism, and multilevel selection give different perspectives on what causes the association (in technical terminology, the “assortment”) of helpers (Fletcher & Doebeli, 2009; Fletcher & Zwick, 2006; Queller, 1985). In this paper we define levels based on the identity of the recipient of altruistic behavior, e.g., kin, interaction partners, group members, but boundaries are not sharp, since kin may interact reciprocally or be members of the same group. In the upper realm, altruism is among the subjects taken up by religion, philosophy, and the social sciences. This essay draws on these sources, but stays within a naturalistic worldview. Its purpose is to enrich philosophical discussion with ideas from biology and systems theory.

The scheme of levels of altruism is based on general ideas about hierarchical order that have been usefully applied to other topics (Zwick 1978, 2009). Here they yield the hierarchy of Figure 1. This scheme organizes diverse knowledge in a “crude look at a whole” (Gell-Mann 1994). A coherent image of the range of possible altruism types, and the difficulties associated with them, may stimulate thought about societal challenges that call for altruistic behavior, especially the challenge of environmental and social sustainability.

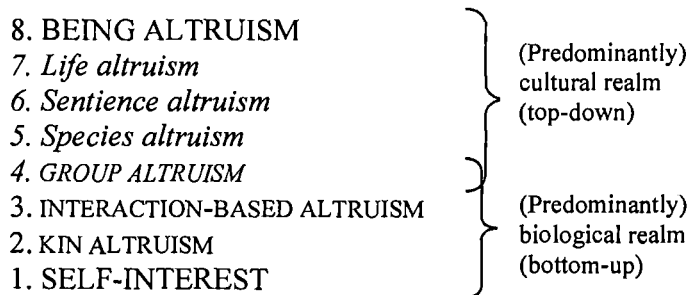


Figure 1. Levels of Altruism

Level 1 is not actually an instance of altruism, but is the foundation for all the higher levels. An all-caps case is used for the predominantly biological realm (levels 1-4); an italics font is used for the sociocultural realm (levels 4-7). Level 4 is all-caps and in italics to indicate that it partakes in both realms. Level 8 is all-caps to mark completion of the hierarchy and, simultaneously, the manifestation of a qualitatively different phenomenon.

## 1. SELF-INTEREST

The foundation of action for others is action for oneself, the possibility of which first emerges in the evolution of life. A living system is one that can “act on its own behalf” (Kauffman 2000); this demarcates the biological from the merely physical. Understanding living systems requires the fundamental categories not only of matter, energy, and information, but also of “utility,” a fourth category introduced into science by game and decision theory (von Neumann & Morgenstern 1944). Utility – and its elementary manifestation in “fitness” – allow the phenomenon of “interests” to be treated with generality and precision.

To speak of an individual “acting on its own behalf” is not necessarily to assert intention, cognition, rationality, or consciousness or to invoke a final cause explanation of behavior. A bacterium acts on its own behalf when the external presence of food molecules leads to the synthesis inside the cell of proteins that import and digest this food, and enable the bacterium to maintain its internal order and reproduce. This is a final cause explanation only in its invocation of an optimality principle, namely fitness-based selection.

Fitness has four features that invite further comment: First, it is a property not of an individual but of the individual-environment interaction. Second, biological agency is “rational” in being governed by utility, but for simple organisms that lack cognitive subsystems, rationality is vicariously achieved *for* the individual by natural selection. Only in complex organisms, e.g., those with nervous systems, is utility – and rationality – partially internalized. Third, the individual-environment interaction is open-ended in time. To use Derrida’s notion of “différance” (1982), except for extinction, “final” evaluations of fitness are indefinitely deferred. Fourth, the interaction involves at least two levels: organism and population. The population evolves by changes in composition, but from another perspective, selection acts on thermodynamically self-maintaining units. A biological individual acts on its own behalf via self-construction and self-maintenance, i.e., “autopoiesis” (Maturana & Varela 1980). Successful action of this sort is a precondition for reproductive fitness, so what is fundamental to “having interests” is the metabolic maintenance of order. This is echoed by the top level of Figure 1, which refers to altruism towards “being” in its most general sense, which implies an order that has at least minimal persistence.

## 2. KIN ALTRUISM

The earliest appearance of “having interests” leads immediately to its extension, to individuals acting also on the basis of the interests of others. This is possible because the other is not wholly other, but similar in some degree to self, especially when the other is related to self in origin. Once action governed by self-interest is promoted by evolutionary selection, its extension to kin is inevitable, and this extension is often regarded as the principal manifestation of altruism (Foster, Wenseleers, & Ratnieks, 2006; Lehmann & Keller, 2006; West, Griffin, & Gardner, 2007).

Level 2 thus marks the first appearance of altruism proper, but the transition from self-interest to kin altruism is not a sharp break. The other is an extension of self. This is captured in the idea of “inclusive fitness,” (Hamilton, 1964), reductionistically and anthropomorphically spoken of in terms of “selfish genes” (Dawkins 1976). Extension is both in time and in space: in time it

encompasses progeny; in space it encompasses relatives. Progeny and relatives, being genetically similar, are not wholly other. As with self-interest, kin altruism does not require conscious action or recognition.

The biological realm actually extends all the way up the hierarchy, and for human beings, the sociocultural realm extends all the way down (the two domains shown in Figure 1 only mark the ranges where biology and culture predominate.) One cannot overestimate the human significance of altruism towards kin. The parent-child bond manifests this phenomenon in its strongest form, although game theorists have shown that this bond is not free of conflict of interest (Trivers, 1974). Early forms of human social organization – hunting and gathering and also agricultural societies – were based on kinship. Later forms of social organization on larger scales build on the family unit, and rarely completely transcend kinship. A stumbling block to the stability of large scale human organizations has always been “patrimonialism” (Fukuyama 2011), i.e., corruption motivated by the desire to pass wealth and power to progeny and relatives. Religious and philosophical moral teachings give family relations great emphasis, as illustrated by the Commandment to honor one’s father and mother, or in more extreme forms such as ancestor worship. Confucius and Socrates both asserted the priority of filial obligations over obligations to unrelated persons, explicitly rejecting a universalism that asserts an absolute parity in our moral obligations to other persons.

### **3. INTERACTION-BASED ALTRUISM**

From altruism towards kin, nature ratchets up to altruism towards agents in direct interaction with the individual, i.e., to reciprocal altruism. An individual often does not know which other individuals are genetically related, so a proxy for genetic relatedness is needed. Propinquity is one possible proxy, since those close by are often kin. An alternative proxy is altruistic behavior by the other agent. Actually it doesn’t matter whether or not the other agent acting altruistically is kin or not as long as the helping genotypes of interest are associated (“assorted”) with the giving behavior of others—even if a different species (Fletcher & Zwick 2006). Kinship is the simplest way to get altruism established, not its essence.

The human significance of reciprocal altruism is as salient as kin altruism. The principle of reciprocity is implicit in the Golden Rule, and in the biblical injunction to love your neighbor, although the latter might be viewed as an injunction calling for group altruism. Reciprocity is the key to harmonious relations in all small groups, even of kin. We, and presumably other social animals, are biologically primed to track the actions of others and note failures of reciprocity (Cosmides, Barrett, & Tooby, 2010).

In Axelrod’s (1984) reciprocal altruism simulations, tit-for-tat (TfT) was the most successful of the strategies submitted. Tit-for-tat is “nice,” i.e., cooperating first and in response to cooperation by the other, “provokable,” i.e., responding to defection with defection, “forgiving,” i.e., responding to the resumption of cooperation with cooperation, and “transparent,” i.e., acting in a way readily grasped by others. In the analysis of reciprocal altruism, it is not genotypic similarity that is critical to altruism, but assorted phenotypic behavior (Fletcher & Zwick, 2006; Queller, 1985).

#### 4. GROUP ALTRUISM

Genetic relatedness and the informational capacities needed for reciprocal altruism (to remember other agents and their past actions) may both be absent. Generalized reciprocity (actions based on past experiences in general) and indirect reciprocity (actions based on reputation of others) are not based on personal acquaintance and approach altruism based on group membership. Although there is controversy about the relative strength of group selection (Leigh, 2010; Williams, 1966), even those dismissive of its significance (Lehmann & Keller, 2006; West et al., 2007) acknowledge mechanisms of help that are keyed to the display of identifying tags, known in the evolutionary biology literature as “green beard” effects (Dawkins, 1976; Queller, 2011).

Group altruism – more generally, group solidarity – is very important in human society, and occurs at multiple levels, ranging from small groups, organizations, communities, ethnic groups, nations, followers of the same religion, etc. Solidarity with other members of one’s community or ethnic group is a ubiquitous and important social phenomenon. Nationalism is a potent historical force, as is class solidarity. It has been argued (Wilson 2002) that the evolutionary “function” of religion is precisely to promote group cohesion. It is plain that the rational actor view of human nature in economic theory is only partially correct; in addition to “self-assertion,” individuals also show a tendency to “integration” into larger groups (Koestler 1978).

Human nature has been endowed by evolution with a predisposition towards cooperation, given the right circumstances, with those with whom we identify. We also live in a context of culture, which provides motivations for altruistic action. So human group altruism is supported from both “below” (nature) and “above” (culture). Direct biological support is strong only up to the scale of small groups, but it still provides a basis for further increasing the scope of altruism at higher levels.

This basis is constituted by *proximal* supports for altruism that become salient, manipulable, and detached from their original *ultimate* (evolutionary) causes. These proximal supports include hormonal factors, mirror neurons that model the other as self, and parts of the brain that are dedicated to detecting defection. Layered on top of genetically-based evolutionary factors are nervous system-based societal and cultural factors. Game-theoretically, behavior is no longer simply dictated by one’s own “base-level” utility, but on higher level utilities (“social motives”) that depend also on the base-level utilities of others (Messick & McClintock 1968). The key to altruism in human groups is thus the *extension* of self, via proximal mechanisms, to encompass others. In Confucian moral philosophy, this extension was conceptualized in the notion of *tui* (Nivison 1996).

Group altruism, however, is not a simple good. It generally requires between-group competition. Group solidarity often promotes aggression towards outsiders. “The egoism of the group feeds on the altruism of its members” (Koestler 1967). The evils of human history may be due more to the tendency towards integration than towards self-assertion.

#### 5. Species altruism

Universal ethics calls for species altruism: the human other is to be regarded as the same as self. This is the largest meaning of “neighbor” in the biblical “You shall love your neighbor as

yourself” or of “other” in the Golden Rule. It is implied in the Talmudic saying that he who saves a life saves a complete world and in Kant’s categorical imperative of acting in such a way that one’s action is a rule for humanity. But the endorsement of the sacredness of every human being by all the major religions has not eliminated from these teachings doctrines and practices that deny such universality. In practice as opposed to theory, humanity’s religions have attained mostly to group altruism, directed only towards members of the same faith.

From the perspective of game theory, species altruism faces a fundamental difficulty. Species altruism requires the extension of altruism to the human species as a single group, but game theory seems to predict that, without competing groups, defection in this one group would go unchecked. However, culture and societal influences, not adequately encompassed by this theory, can promote cooperation even in a single group.

Altruism towards conspecifics is still not the highest level of altruism. The attainment of species altruism might end poverty and war, but would not solve the problems that arise from humanity’s interaction with nature. Exploitation of other species isn’t precluded by a universalization of empathy towards the entire human species, but since the exploitation of nature is also the means by which some humans exploit others, species altruism will only be achievable when the exploitation of nature is significantly mitigated.

## **6. Sentience altruism**

Of the myriad forms of life, it is sentient beings who are most easily felt to be similar to self. The Buddha said that life is suffering, and the most concentrated kind of suffering is pain. Empathy and compassion are naturally directed towards other sentient beings who can experience pain. Pain is, however, the bottom of the scale of similarity; intelligence, emotion, and play are at the top of the scale, hence our ready empathy for other primates and dolphins.

Sentience altruism is supported by commonality of genotypes; for example, we share 98% of our genotype with apes. It is also enabled by the phenomenon of mirror neurons and by our “theory of mind” about other sentient beings. Indeed, it may be easier to extend compassion to animals than to extend it to other human beings, because the competition we also feel towards other persons is absent. The Confucian sage Mencius, trying to influence King Xuan to behave more humanely to his subjects, noted that the king felt empathy for an ox being led to sacrifice, and urged the extension (*tui*) of this empathy to his human subjects, telling the king, “Your compassion is sufficient to reach animals, yet you do nothing for your people” (Nivison 1996). But logically, altruism towards conspecifics should be stronger, since other humans are more like us than other creatures.

## **7. Life altruism**

The extension of empathy towards sentient beings still allows destructive behavior towards nature. It leaves out, as an object of empathy, the plant kingdom, as well as animal species judged to be non- or insufficiently sentient, and thus cannot protect the biospheric web on which all life depends. It fails to generate a “yes” answer to the question, “Should trees [and by implication all living beings] have standing?” (Stone 1972). Altruism limited to sentient beings

does not, for example, preclude cutting down rain forests, which are critical for controlling greenhouse gasses.

Altruism manifests its largest scope in reverence for life, for the thin biospheric film of the earth that we and all sentient life are part of. Life is a result of the interaction of the macrocosm of cosmic energies and the microcosm of inert matter. It mediates this interaction, and has the potential to play a central role in the universe. Human beings, more specifically, have the responsibility (Jonas 1984) to preserve and enhance the life that flourishes on this planet. We cannot discharge this cosmic responsibility if empathy rises only to the level of species altruism. Biospheric sustainability requires biocentric, not anthropocentric or even sentient-centric, values.

## **8. BEING ALTRUISM**

Life altruism is the limit of the phenomenon of organisms “having interests.” But by virtue of both biology and culture, a further extension into a qualitatively different order is possible. For the Confucian philosopher Wang Yangming, “...instead of ‘no self’ [the focus of Buddhist thought] the ideal moral attitude is ‘pan-self’ ... this is expressed in the idea that for the perfect moral person ‘all things are one body’.” In Wang’s more excited moments, ‘all things’ include even the inanimate and nonliving. “One who is truly good winces even when seeing a tile broken.” (Nivison 1996). Similarly, for Augustine, being itself was inherently good, and evil was privation, non-being. The possibility of an “I-Thou” relationship (Buber 1937) extends beyond life. It may be that species, sentience, and life altruisms must be rooted above in this transcendent realm.

### **The hierarchical model**

The above discussion was guided by a general hierarchical model described previously (Zwick 1978, 2009). In accord with that model, the hierarchy of Figure 1 consists of a small number of levels that divide into two domains: biological and sociocultural. There is a spontaneous ascending biological tendency that instantiates the lowest levels without difficulty, from self-interest to kin altruism to interaction-altruism, but ascent falters after entering the upper domain at group altruism. At that point, continued ascent requires the assistance of a top-down – sociocultural – influence. Mechanisms of the lower domain continue in the upper domain but are transformed by its radically different character, ultimate genetic factors being largely superseded by proximal psychological factors. When the limits of the upper domain are reached, further ascent might yet achieve a qualitatively different manifestation. Altruism thus has what Chinese philosophy called “two roots” (Nivison 1996): one below in biology, and one above in culture, or, in a Platonic perspective, in transcendental values that we accept. Chinese philosophy – Mencius, specifically – also had an alternative “one root” view, which held that altruism has a unitary basis in our innate moral heart-mind. Probably Mencius would say that our biological disposition towards altruism and its transcendental value are in fact one and the same, the gift and the imperative of Heaven.



## References

- Axelrod, Robert (1984). *The Evolution of Cooperation*. New York: Basic Books.
- Buber, Martin (1937). *I and Thou*. New York: Charles Scribner's Sons. Reprinted Continuum International Publishing Group, 2004
- Cosmides, L., Barrett, H. C., & Tooby, J. (2010). Adaptive specializations, social exchange, and the evolution of human intelligence. *Proceedings of the National Academy of Science, USA*, 107, 9007-9014.
- Darwin, Charles (1871). *The Descent of Man, and Selection in Relation to Sex*. (1st ed.). London: John Murray.  
[http://darwin-online.org.uk/EditorialIntroductions/Freeman\\_TheDescentofMan.html](http://darwin-online.org.uk/EditorialIntroductions/Freeman_TheDescentofMan.html).
- Dawkins, Richard (1976). *The Selfish Gene*. New York: Oxford University Press.
- Derrida, Jacques (1982). "Différance" in *Margins of Philosophy*, trans. Alan Bass, Chicago & London: Chicago University Press.
- Fletcher, J. A., & Doebeli, M. (2009). A simple and general explanation for the evolution of altruism. *Proceedings of the Royal Society London B*, 276, 13-19.  
<http://www.sysc.pdx.edu/download/papers/Fletcher&DoebeliProcB2009.pdf>
- Fletcher, J.A., and Zwick, M. (2004). "Strong Altruism Can Evolve in Randomly Formed Groups". *Journal of Theoretical Biology*, 228:303-313.  
<http://www.sysc.pdx.edu/download/papers/JTB2004.pdf>
- Fletcher, J.A., and Zwick, M. (2006). "Unifying the Theories of Inclusive Fitness and Reciprocal Altruism." *The American Naturalist*, 168:252-262.  
[http://www.pdx.edu/sites/www.pdx.edu.sysc/files/media\\_assets/sysc\\_AmNat06.pdf](http://www.pdx.edu/sites/www.pdx.edu.sysc/files/media_assets/sysc_AmNat06.pdf)
- Fletcher, J.A., and Zwick, M. (2007). "The Evolution of Altruism: Game Theory in Multilevel Selection and Inclusive Fitness." *Journal of Theoretical Biology*, 245:26-36.  
[http://www.pdx.edu/sites/www.pdx.edu.sysc/files/media\\_assets/sysc\\_jtb\\_2006\\_09.pdf](http://www.pdx.edu/sites/www.pdx.edu.sysc/files/media_assets/sysc_jtb_2006_09.pdf)
- Foster, K. R., Wenseleers, T., & Ratnieks, F. L. W. (2006). Kin selection is the key to altruism. *Trends in Ecology and Evolution*, 21(2), 57-60.
- Fukuyama, Francis (2011). *The Origins of Political Order: From Prehuman Times to the French Revolution*. New York: Farrar, Straus and Giroux.
- Gell-Mann, Murray (1994). *The Quark and the Jaguar. Adventures in the Simple and the Complex*. W. H. Freeman & Co., New York.
- Hamilton, W. D. (1964). The Genetical Evolution of Social Behavior I and II. *Journal of Theoretical Biology*, 7, 1-52.
- Jonas, Hans (1984). *The Imperative of Responsibility: In Search of an Ethics for the Technological Age*. Chicago: University of Chicago Press.
- Kauffman, Stuart (2000). *Investigations*. New York: Oxford University Press.
- Koestler, Arthur (1967). *The Ghost in the Machine*. London: Pan Books.
- Koestler, Arthur (1978). *Janus: A Summing Up*. New York: Random House.
- Lehmann, L., & Keller, L. (2006). The evolution of cooperation. A general framework and a classification of models. *Journal of Evolutionary Biology*, 19(5), 1365-1376.

- Leigh, E. G. (2010). The group selection controversy. *Journal of Evolutionary Biology*, 23(1), 6-19.
- Maturana, H.R. & Varela, F.J. (1980). *Autopoiesis and Cognition*. Boston Studies in the Philosophy of Science vol. 42. Dordrecht: D. Reidel.
- Messick, D. M.; McClintock, C. G. (1968). "Motivational Bases of Choice in Experimental Games". *Journal of Experimental Social Psychology* 4: 1-25.
- von Neumann, John, & Morgenstern, Oskar (1944). *Theory of Games and Economic Behavior*. New York: Wiley.
- Nivison, David S. (1996). *The Ways of Confucianism: Investigations in Chinese Philosophy*. Chicago: Open Court.
- Queller, D. C. (1985). Kinship, Reciprocity and Synergism in the Evolution of Social Behaviour. *Nature*, 318, 366-367.
- Queller, D. C. (2011). Expanded social fitness and Hamilton's rule for kin, kith, and kind. *Proceedings of the National Academy of Science, USA*, 108(2), 10792-10799.
- Rifkin, Jeremy (2010). *The Empathic Civilization: The Race to Global Consciousness in a World in Crisis*. New York: Penguin.
- Sober, E., and Wilson, D.S. (1998). *Unto Others, The Evolution and Psychology of Unselfish Behavior*. Harvard University Press, Cambridge, MA.
- Stone, Christopher D. (1972). *Should Trees Have Standing?: Law, Morality, and the Environment Book*. Oxford: Oxford University Press.
- Trivers, R. L. (1974). Parent-Offspring Conflict. *American Zoologist*, 14(1), 249-264.
- West, S. A., Griffin, A. S., & Gardner, A. (2007). Social semantics: altruism, cooperation, mutualism, strong reciprocity and group selection. *Journal of Evolutionary Biology*, 20, 415-432.
- Williams, George C. (1966). *Adaptation and Natural Selection*. Princeton, N.J.: Princeton University Press.
- Wilson, David Sloan (2002). *Darwin's Cathedral: Evolution, Religion, and the Nature of Society*. Chicago: University of Chicago Press.
- Zwick, Martin (1978). "Some Analogies of Hierarchical Order in Biology and Linguistics." *Applied General Systems Research: Recent Developments and Trends*, George Klir, ed., New York: Plenum Press, pp.521-529. <http://www.sysc.pdx.edu/download/papers/hbl2.pdf>
- Zwick, M. (2009). "Holism and Human History." *Metanexus conference: Cosmos, Nature, and Culture: A Transdisciplinary Conference*. July 18-21, 2009; Phoenix, Arizona. <http://www.metanexus.net/conference2009/abstract/Default.aspx?id=10857>