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## Levels of Altruism

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# LEVELS OF ALTRUISM

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## *Abstract*

The phenomenon of altruism extends from the biological realm to the human socio-cultural 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.

## *Keywords*

Altruism, evolution of cooperation, kin selection, reciprocal altruism, multilevel selection, self

## **Introduction**

This article 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, refined below in the discussion of group altruism, is especially applicable to the most elementary manifestations of this phenomenon; higher manifestations might simply be called ethical behavior or – focusing on the proximal mechanisms 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 cultural conditions the biological 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 explain how altruists can be favored over non-altruists by natural selection. This includes either sufficient association (in technical terminology, “assortment”) among helpers such that benefits of altruism go disproportionately to other altruists (Fletcher and Doebeli, 2009; Fletcher and Zwick, 2006; Queller, 1985), or other group-level selection mechanisms that favor groups with more altruists (Simon et. al. 2012). 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. It offers a descriptive view of altruism, only lightly touching on normative considerations. 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 levels distinctive to 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.

8. BEING ALTRUISM
7. *Life altruism*
6. *Sentience altruism*
5. *Species altruism*
4. *GROUP ALTRUISM*
3. INTERACTION-BASED ALTRUISM
2. KIN ALTRUISM
1. SELF-INTEREST

### 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 and Morgenstern 1944). Utility – and its specific 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: (1) It is a property not of an individual but of the individual-environment interaction. (2) The interaction involves at least two levels: individual and population. Selection acts on individuals, and the population adapts by changes in composition of individuals and ultimately of allele frequencies. (3) 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. (4) Biological agency is “rational” in being governed by utility (in game/decision theory, this is definitional), 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. A biological individual acts on its own behalf via self-construction and self-maintenance, i.e., “autopoiesis” (Maturana and 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.

While the pursuit of self-interest is not, technically speaking, an instance of altruism because benefit is not conferred on others, it is not synonymous with selfishness or amorality. There is a distinguished tradition of thought which maintains that individuals have a moral obligation to themselves. Also, if one denied the unity of the self, one might even conceptualize an intra-personal (intra-psychic) analog of altruism, where one aspect (or level) of self might sacrifice its interests for another aspect.

## 2. KIN ALTRUISM

Self-interest, the first appearance on the ontological stage of the phenomenon of “having interests” is thus a condition of possibility for altruism. The appearance of this phenomenon 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 et al. 2006; Lehmann and Keller, 2006; West et al. 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 (and in multicellular organisms other cells with the same genotype). 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,” as it were. The domains interact, and the result of this interaction is not a simple sum of separate effects of biology and culture. However, a consideration of the character and consequences of this interaction, as is examined in “dual inheritance theory” (Boyd and Richerson 2005), is beyond the scope of this paper.

One cannot overestimate the human significance of altruism towards kin. The parent-child bond, in its various (often gendered) forms, manifests this phenomenon in the strongest way, 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. Proximity 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 of a different species (Fletcher and 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 et al. 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 and 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) (Pfeiffer et al. 2005) and indirect reciprocity (actions based on reputation of others) (Nowak and Sigmund 2005) 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 and 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 there 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 also 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 at best only partially correct. In addition to “self-assertion,” individuals also have a tendency of “integration” into larger groups (Koestler 1978), a tendency that is mysteriously ignored by ideologues of market individualism. This tendency to integration is not free of problems: these larger groups are often multiple, with resulting tensions and incompatibilities between them.

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 other 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. Such biological influences are not specific to human beings, but occur in other social primates; evidence exists even for pro-social behavior in rodents (Bartal et al. 2011).

*Ultimate* evolutionary causes give rise to *proximal* supports for altruism, including hormonal influences, mirror neurons that model the other as self (Rizzolatti and Craighero 2004), and parts of the brain dedicated to detecting defection (Cosmides and Tooby 2005). In human beings, these proximal supports become manipulable and detached from their origins. 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, i.e., more encompassing, utilities, sometimes called “social motives,” that depend on one’s base-level utility but also on the base-level utilities of others (Messick and 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).

An example of such a higher-level utility is the sum of the base-level utilities of all the players; action that optimizes this utility promotes the welfare of the group. A second example sets the higher-level utility at the minimum utility of all the players; optimizing this “maximin” utility promotes the welfare of the most disadvantaged. A third example is a higher-level utility value that increases with the uniformity of all individual utilities; optimizing this utility promotes the goal of equality. Social motives are not necessarily benign, however; a fourth example is a higher-level utility that increases with the *difference* between base-level utilities of self and other players; this promotes selfish, not altruistic, behavior.

The existence of these higher-level utilities resolves the apparent contradiction between defining altruism as action that benefits others at cost to self and explaining altruism as resulting from extending the sense of self to include others: to the degree that the other is viewed as self, action on behalf of the other cannot be said to involve cost to oneself. But this contradiction is resolved by refining the definition previously given of altruism so “cost to oneself” refers to one’s *base-level* utility. Higher-level utility, reflecting the extension of self, overrides these costs. But the tension between base and higher levels is not thereby erased. It persists; indeed this tension is the basis of altruism: if one were not aware of the base-level utility, there would be no cost to the action; if one were not aware of the higher-level utility, one would not choose this action.

If one focuses exclusively on this higher-level utility, without acknowledging the tension that typically exists between this level and the base level, one might simply jettison the notion of “altruism” and give action driven by this high-level utility the label of “egoism.” This approach, taken by some advocates of “ethical egoism,” is analogous to the view in the literature on the evolution of cooperation that inclusive fitness fully explains all phenomena of altruism. This is in contrast to the view favored here that multi-level selection is a more complete description of these phenomena because it explicitly models the tensions between different levels of selection and accommodates dynamics that may only emerge at the higher level (Simon et al. 2012). Here, analogously, a multi-level approach to altruism is to be preferred to a single-level approach because a multi-level approach acknowledges and represents the conflict inherent in altruistic action. It also does not succumb to the illusion that there exists a preordained harmony between interests at different levels, i.e., to the illusion that “enlightened” individual self-interest will always and automatically promote what is optimal for society.

Even when the tension between individual and group interest is resolved, group altruism is not a simple good. It generally requires – and is, in turn, fed by – 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. Human species altruism**

Beyond the group is the species. (We treat ‘population’ in the class of ‘group,’ and ignore the level of ecological communities, which might be encompassed if we allowed our hierarchy to branch.) 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 in fact 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, game theory is not conceptually rich enough to adequately encompass sociocultural influences that 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. 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. Species altruism also has its dark side in eugenic ideologies that recommend the sacrifice of the infirm for the sake of the species (or race).

### **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 96% of our genotype with apes (Mikkelsen et al. 2005). It is also enabled by the phenomenon of mirror neurons and by our “theory of mind” about other sentient beings (Premack and Woodruff 1978). 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.

Altruism towards other sentient beings may be curtailed or inhibited by other mechanisms; some sentient beings scare us because of their appearance or behavior or because we would be food for them.

### 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, central in the modern era to the philosophy of Albert Schweitzer, but strongly present long ago in ancient Indian thought. Our contemporary consciousness extends this reverence to the entirety of the thin biospheric film of 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, and to be effective in countering species or group interests (in the ever-present tension between jobs and “the environment”), these biospheric values must be held categorically, not merely instrumentally.

Life altruism obviously has strong cultural sources, but it may also have biological foundations, as suggested by the hypothesis of biophilia (Fromm 1964; Wilson 1984; Kellert 1993). In terms of Figure 1, this hypothesis asserts that the biological realm extends all the way to the top of the hierarchy. Still, biological influences clearly exert their most potent effects at the group level, supporting an intensity of commitment and a willingness to sacrifice oneself that is unequalled at the species, sentience, or life levels.

### 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 nonliving: “One who is truly good winces even when seeing a tile broken.” (Nivison 1996). An expanded sphere of empathy reaches its culmination in extension to inanimate objects. (Here, altruism would appear to privilege order over disorder, but a Daoist as opposed to Confucian view, would see order and disorder as equal aspects of Being.) 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 of being altruism.

#### Similarity and difference

A major deficiency limits the view developed so far in this paper. In this view, extension of self to include others depends on the *similarity* of others to self: the greater the similarity, the easier it is to make this extension, other things being equal. (But as noted in the discussion of Mencius and King Xuan, other things are not equal, since competition with other humans is absent for animals, which may make it easier to be kind to animals.) This focus on similarity goes all the way up the hierarchy to being altruism, since in Heideggerian terminology, “the Being of beings” is, roughly speaking, what individual beings have in common (or, more precisely, the ontological basis of the ontic multiplicity of beings). But according to Levinas (1968) there is a radically different basis for altruism or ethics: “the Other” in its primordial alterity, a sign of and gateway to the infinite. For Levinas, responsibility for the Other is *prior* to responsibility to self; this absolute responsibility derives from irreducible difference and not similarity.

A view of altruism based on similarity and ignoring difference is thus incomplete. But this incompleteness is at least partially mitigated by the fact that similarity and difference, like all polar dyads, are interdependent and not simple opposites. Altruism based on similarity seeks the universal, while altruism founded on difference values the

unique, but the uniqueness of other beings (at least for beings of some minimal complexity) is universal, so obligation to the Other is also based on sameness, i.e., the common fact of uniqueness. From this perspective, Levinas overreaches in suppressing the significance of obligation to self and regarding the uniqueness of the Other as more valuable than the uniqueness of self. It might even be argued (Zarader 2006) that the notion of Being developed by Heidegger is not exclusively oriented towards the “Same” but approaches – though it does not reach – the recognition of the Other that Levinas insisted upon. Vulnerability is a condition also shared even by radically different beings. In biblical ethics, the stranger is the prototypical Other (from the perspective of the group); concern for the stranger is bolstered by reminders of the fact of common experience: the people of Israel were also strangers in Egypt. The stranger also has an Other, and responds with empathy, as did the Samaritan.

Altruism based on difference may be unique to the cultural realm, as a biological basis for it is not readily apparent. But perhaps such a basis might inhere in the fact that “information is news of difference” (Bateson 1979), so sensory input about the unique Other is informationally rich and commands attention.

### Two clarifications

The view of altruism presented in this paper is descriptive and not normative, although ethical implications are sometimes implicit. Two clarifications, bearing on these implications, are here made explicitly. First, a level in Figure 1 represents only a type of altruism distinguishable by scope; its attainment does not necessarily imply empathy towards *all* entities encompassed by the level. For example, species altruism doesn’t mean altruism towards *all* conspecifics; it means an expanded sphere of empathy and thus altruism towards *some* other individuals based on common species identity.

Second, it is *not* being argued here that “higher levels” of this hierarchy are inherently superior ethically to lower levels, so that when established they completely supersede the lower levels. Rising above self-interest does not render the claims of self-interest invalid; as the Talmudic call to responsibility asks, “If I am not for myself, who will be for me? If I am only for myself, what am I?” As already noted, both Socrates and Confucius regarded filial obligations (kin altruism) as not trumped by equality of persons (group or species altruism). There is certainly a sense in which extension of self is a good. In the language of dynamics, being altruism (or life altruism) is an ethical “attractor” that extends the self to more inclusive levels. But the bottom level of self-interest (or kin altruism) is also an attractor; its claim derives from immediacy and intimacy, not universality. Just as the future is discounted, so too is the distant discounted, other things being equal. Locality of self is also a good. Between these opposing attractors, multiple levels of altruism coexist, typically in tension. This hierarchical framework offers no help in weighing the relative merits of ethical claims arising from different levels, but it suggests the following minimal normative injunction: individuals should ideally be sensitive to the claims of all levels. (This “ought” is not deduced from the descriptive “is”, just inspired by it.) This injunction does not automatically favor the claims of “higher” levels over “lower” ones. Resolving tensions between claims in any concrete circumstance can be done only by considering details of context.

There is another reason that higher levels do not simply supersede lower ones. As already noted, the extension of self has also its negative side – this is especially the case for group altruism, where intra-group bonding often goes hand in hand with extra-group hostility. So the ethical value of the various levels in this hierarchy is not ordered in a simple monotonic progression. Nor are these levels necessarily temporal stages or logical prerequisites to an ascent that is unidirectional. Relations between levels is complex, both descriptively and normatively.

### The hierarchical model

This discussion of altruism is 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. At the base of this hierarchy is self-interest, which establishes the very possibility of “interest” and thus of altruism, but which in the absence of higher levels generates selfish behavior. There is in nature a spontaneous ascending biological tendency that instantiates the lowest levels without difficulty, from self-interest to kin altruism to interaction-altruism, but the biological support for altruism weakens and ascent falters after entering the upper domain at the group level. 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.

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### References

- Axelrod R (1984) *The evolution of cooperation*. Basic Books, New York.
- Bartal I, Decety J, & Mason P (2011) Empathy and pro-social behavior in rats. *Science* 334:1427-1430
- Bateson G (1979) *Mind and nature: a necessary unity*, Bantam Books, New York.
- Boyd R, Richerson PJ (2005) *Not by genes alone: how culture transformed human evolution*. University of Chicago Press, Chicago.
- Buber M (1937) *I and thou*. Charles Scribner's Sons, New York. Reprinted Continuum International Publishing Group, 2004.
- Cosmides L, Barrett HC, Tooby J (2010) Adaptive specializations, social exchange, and the evolution of human intelligence. *Proc Natl Acad Sci USA* 107:9007-9014.
- Cosmides L, Tooby J (2005) Neurocognitive adaptations designed for social exchange. *The handbook of evolutionary psychology*, 584-627.
- Darwin C (1871) *The descent of man, and selection in relation to sex* (1st ed.). John Murray, London. [http://darwin-online.org.uk/EditorialIntroductions/Freeman\\_TheDescentofMan.html](http://darwin-online.org.uk/EditorialIntroductions/Freeman_TheDescentofMan.html).
- Dawkins R (1976) *The selfish gene*. Oxford University Press, New York.
- Derrida J (1982) *Différance*. In: Bass A (trans), *Margins of philosophy*. Chicago University Press, Chicago.
- Fletcher JA, Doebeli M (2009) A simple and general explanation for the evolution of altruism. *Proc R Soc B* 276:13-19. <http://www.sysc.pdx.edu/download/papers/Fletcher&DoebeliProcB2009.pdf>
- Fletcher JA, Zwick M (2004) Strong altruism can evolve in randomly formed groups. *J Theor Biol* 228:303-313. <http://www.sysc.pdx.edu/download/papers/JTB2004.pdf>
- Fletcher JA, Zwick M (2006) Unifying the theories of inclusive fitness and reciprocal altruism. *Am Nat* 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 JA, Zwick M. (2007) The evolution of altruism: game theory in multilevel selection and inclusive fitness. *J Theor Biol* 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, KR, Wenseleers T, Ratnieks FLW (2006) Kin selection is the key to altruism. *Trends Ecol Evol* 21(2):57-60.
- Fromm E (1964) *The heart of man*. Harper & Row, New York
- Fukuyama F (2011) *The origins of political order: from prehuman times to the French Revolution*. Farrar, Straus and Giroux, New York.
- Gell-Mann M (1994) *The quark and the jaguar: adventures in the simple and the complex*. W. H. Freeman & Co., New York.
- Hamilton WD (1964) The genetical evolution of social behavior I and II. *J Theor Biol* 7:1-52.

- Jonas H (1984) *The imperative of responsibility: in search of an ethics for the technological age*. University of Chicago Press, Chicago.
- Kauffman S (2000) *Investigations*. Oxford University Press, New York.
- Kellert SR (ed) (1993) *The biophilia hypothesis*. Island Press.
- Koestler A (1967) *The ghost in the machine*. Pan Books, London.
- Koestler A (1978) *Janus: a summing up*. Random House, New York.
- Lehmann L, Keller L (2006) The evolution of cooperation: a general framework and a classification of models. *J Evolution Biol* 19(5):1365-1376.
- Leigh EG (2010) The group selection controversy. *J Evolution Biol* 23(1):6-19.
- Levinas E (1968) The trace of the other. In: Taylor MC (ed). *Deconstruction in Context*. University of Chicago Press, Chicago.
- Maturana HR, Varela FJ (1980) *Autopoiesis and cognition: Boston studies in the philosophy of science vol. 42*. D. Reidel, Dordrecht.
- Messick DM, McClintock CG (1968) Motivational bases of choice in experimental games. *J Exp Soc Psychol* 4:1-25.
- Mikkelsen TS, Hillier LW, Eichler EE, Zody MC, Jaffe DB, Yang SP, Rosenbloom K (2005) Initial sequence of the chimpanzee genome and comparison with the human genome. *Nature* 437:69-87.
- von Neumann J, Morgenstern O (1944) *Theory of games and economic behavior*. Wiley, New York.
- Nivison DS (1996) *The ways of Confucianism: investigations in Chinese philosophy*. Open Court, Chicago.
- Nowak MA, Sigmund K (2005) Evolution of indirect reciprocity. *Nature* 437:1291-1298.
- Pfeiffer T, Rutte C, Killingback T, Taborsky M, Bonhoeffer S (2005) Evolution of cooperation by generalized reciprocity. *Proc R Soc London B* 272:1115-1120.
- Premack D, Woodruff G (1978) Does the chimpanzee have a theory of mind? *Behav Brain Sci* 1:515-526
- Queller DC (1985) Kinship, reciprocity and synergism in the evolution of social behaviour. *Nature* 318:366-367.
- Queller DC (2011) Expanded social fitness and Hamilton's rule for kin, kith, and kind. *Proc Natl Acad Sci USA* 108(2):10792-10799.
- Rifkin J (2010) *The empathic civilization: the race to global consciousness in a world in crisis*. Penguin, New York.
- Rizzolatti G, Craighero L (2004) The mirror-neuron system. *Annu Rev Neurosci* 27:169-192.
- Simon B, Fletcher JA, Doebeli M (2012) Toward a general theory of group selection. *Evolution*, in press.
- Sober E, Wilson DS (1998) *Unto others: the evolution and psychology of unselfish behavior*. Harvard University Press, Cambridge.
- Stone CD (1972) *Should trees have standing?: law, morality, and the environment book*. Oxford University Press, Oxford.
- Trivers RL (1974) Parent-offspring conflict. *Am Zool* 14(1):249-264.
- West SA, Griffin AS, Gardner A (2007) Social semantics: altruism, cooperation, mutualism, strong reciprocity and group selection. *J Evolution Biol* 20:415-432.
- Williams GC (1966) *Adaptation and natural selection*. Princeton University Press, Princeton.
- Wilson DS (2002) *Darwin's cathedral: evolution, religion, and the nature of society*. University of Chicago Press, Chicago.
- Wilson EO (1984) *Biophilia*. Harvard University Press, Cambridge.
- Zarader M (2006) *The unthought debt: Heidegger and the Hebraic heritage*. Stanford University Press, Stanford.

Zwick M (1978) Some analogies of hierarchical order in biology and linguistics. In: Klir G (ed) Applied general systems research: recent developments and trends. Plenum Press, New York, 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.  
<http://www.metanexus.net/conference2009/abstract/Default.aspx?id=10857>