

Altruistic Economics: Why this is a Sound Alternative to Neo-Classical Economics

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To whom it may concern:

This is to certify that on 10 May 2010, Daniel Hun-min Park submitted an Honors Thesis entitled "Altruistic Economics: Why this is a Sound Alternative to Neo-Classical Economics" to the Undergraduate Economics Program. This thesis has been judged to be acceptable for purposes of fulfilling the requirement to graduate with Tepper College Honors.

Sincerely,

A handwritten signature in black ink, appearing to read "S. Spear", written over a horizontal line.

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Abstract

Neo-classical economic analysis, along with almost all game theory, has treated economic gain as the primary human motives for centuries. However, the predictions and models derived from this assumption of rational selfishness towards economic gain have failed in many contexts, and more economists are realizing that a well-functioning economy cannot rely only on self-interest; but also requires cooperation and altruistic behaviors that benefits people's wellbeing as a whole. Compiling different ideas, theories, and results of experimental designs through in-depth research, this paper will introduce altruism in terms of evolutionary biology and behavioral economics and discuss what altruistic system of economics is, how it works, and why this may be a sound alternative to the current systems of economics that are based on capitalism and money system.

I. Introduction

Economics can be simply defined as a study of human behavior according to incentives, but it can be distinguished from other social sciences by the belief that most, if not all, behaviors can be explained by assuming that agents have stable, well-defined preferences and make rational choices consistent with those preferences in markets that eventually clear. So as in general, economics is a field of study that aims to explain how economies work and how economic agents interact within. However, if an empirical result or real-life phenomenon is difficult to 'rationalize' and requires implausible assumptions to be made within the paradigm, economists face what they term as 'economics anomalies'.

One of the major 'economics anomalies' concerned in contemporary economics study is a concept of altruism, or what social scientists often refer to as cooperative behavior. Much economic analysis, along with virtually all game theory, starts with the assumption that people are both rational and selfish. For example, the prediction that players defect in prisoner's dilemma game and free ride in public goods environments are based on both assumptions. People are assumed to be clever enough to find out the dominant strategy of defecting and free riding in order to maximize their individual utility; moreover, people are also assumed to have no qualms about their failure to do 'the right thing' of caring for others. However, the predictions and models derived from this assumption of rational selfishness have failed in many familiar contexts. World Vision and other charities receive enough contributions from many people to help whoever is in need of support. People give out presents in holidays to family, friends, and even far-out neighbors. Even after watching movies, people make posts on their blogs or websites to inform others about the movie's rating. And people vote in presidential elections where the chance that a single vote will alter the outcome is vanishingly small. But the important question is, why?

Many experimental designs, studies, and theories were brought up by many scientists from wide range of fields (biologists, mathematicians, psychologists, etc) to explain altruistic behaviors that are prevalent not only in human societies, but also in other organisms. Starting

from the biological view of altruism as a sacrifice of one's fitness over other's to the most current researches on the theory of reciprocal altruism, this paper provides a thorough overview on the evolution of altruism to pin down this elusive concept between biology and everyday meanings in social and economic affairs. This overview of altruism will be useful in understanding the evolution of cooperation in behavioral economics and exposing explicitly the flaws in current economic systems that are based on the Darwinian view of evolution, competition, and the survival of the fittest.

After looking at both empirical and psychological perspectives of cooperative human behaviors, the remainder of the paper will examine the role of altruism in the operation of the economy and introduce a recently rising theory called 'altruistic economics', a system to reward generosity rather than selfishness. Explaining the key concepts behind and comparing the fundamental differences between capitalism and altruistic system of economics, the goal of this paper is to justify why this new system of altruistic economy is a sound alternative to the currently popular systems of economics that are based on capitalistic and profit-maximizing ideas. In order to do so, a good place to start will be defining what altruism is.

II. Altruism

The notion of altruism has a long history in philosophical and ethical thought. The term *altruisme*, meaning self-sacrifice for the benefit of others, was first coined by the founding sociologist and philosopher Auguste Comte in 1851, and two years later it entered the English language as altruism. And now the word altruism is defined in two major definitions: first, unselfish concern for the welfare of other; second, an instinctive behavior that promotes the survival of others at a cost of one's own.

Historically speaking, many people considered Comte's ethical system, which the only moral acts were those intended to promote the happiness of others, is rather extreme, meaning that the first term must have evolved over time. However now universally in evolutionary

theory, the second term is accepted by scientists, especially biologists, who are exploring how unselfish behavior could have evolved in accordance with Darwin's natural selection, which expects behaviors to increase one's own chances of survival and reproduction, not those of others.

As mentioned above, much economic analysis today assumes that people maximize their utility, but postulates nothing about what utility actually is. Nonetheless, under such harsh assumption, it is impossible to distinguish altruism from selfishness since one might call altruistic any choice that decreased the utility of the chooser while increasing the utility of others. Under the appropriate utility function, a person whose utility is derived from giving to other people can selfishly give away millions of dollars. Therefore, in order to distinguish altruism's technical meaning and understand its possible application to economic behaviors, it is necessary to take a look at the biological side of this issue.

Biological Altruism

In evolutionary biology, altruism means behavior that reduces the actor's fitness while enhancing the fitness of others. Here, fitness refers to the number of progeny an individual produces or, for species, the average number of progeny from the members of the species. So by behaving altruistically, an organism reduces the number of offspring it is likely to produce itself, but boosts the number that other organisms are likely to produce. It is implausible to unify this biological notion of altruism with the everyday concept, because in everyday parlance, an action would only be called 'altruistic' if it was done with the conscious intention of helping another. However, the biological definition of altruism need no such requirements, for it is the consequences of an action on the reproductive fitness that determine whether the action counts as altruistic, not the intentions, if any, with which the action is performed.

Such altruistic behavior is found commonly throughout the ecosystem, particularly in species with complex social structures. For example, a bee which stings an aggressor gives up its life, but helps the colony survive by doing so. Vervet monkeys give alarm calls to warn

fellow monkeys of the presence of predators, even though such behavior can attract attention to them, increasing their personal chance of being attacked.

From Darwin's viewpoint, the existence of altruism in nature is at first sight puzzling, as Darwin himself realized that the concept itself seemingly contradicts his natural selection theory. E.O. Wilson, a prominent biologist at Harvard University, once called this confusing idea of altruism "the culmination mystery of all biology". Natural selection or 'the survival of the fittest' expects animals to behave in ways that increase their own chances of survival and reproduction, not those of others. But by behaving altruistically an animal reduces its own fitness, so should be at a selective disadvantage against one which behaves selfishly or free ride. But this raises an immediate question: how did altruistic behaviors among species evolve in the first place, and why has it not been eliminated by the natural selection?

Level Selection

The problem of altruism is intimately connected with questions about the level at which natural selection acts. If the natural selection were to act exclusively at the individual level, favoring some individual organisms over others, then it seems that altruism cannot evolve, for behaving altruistically is disadvantageous for the individual organism itself by definition. So the idea of multi-level selection was first introduced by Darwin himself to explain the evolution of altruism. Multi-level selection basically insists that a group containing lots of altruists, each ready to subordinate their own selfish interests for the greater good of the group, may well have a survival advantage over a group composed mainly or exclusively of selfish organisms, although altruists themselves will be at a selective disadvantage relative to their selfish colleagues.

Although the multi-level selection theory could be a possible explanation to how altruism has evolved by between-group selection, a major weakness of the theory was a problem that Dawkins (1976) called 'subversion from within'. Even if altruism benefits the overall fitness of the group, within any group altruistic behavior would be deselected by the dominance

of selfish behavior. Within any group altruists are liable to be exploited by selfish 'free-riders' who refrain from behaving altruistically since these free-riders will have an obvious advantage over altruists in terms of fitness. Even if a group is composed exclusively of altruists, all behaving nicely towards each other, it only takes a single selfish mutant to bring an end to the peace. Therefore, 'subversion from within' is generally regarded as a major stumbling stone of the group-selection theory in the evolution of altruism.

Kin Selection

In 1964, a rivalry theory emerged by William Hamilton which was called as kin selection. This theory, first proposed as an explanation for the existence of altruism, apparently shows how altruistic behavior could evolve without the need for the multi-level selection. The basic idea of kin selection is simple: it assumes that altruists can discriminate in who they interact with. For instance, parent animals often risk their life to distract potential predators away from their offspring, but do not tend to exhibit similar kinds of sacrifice to other animals within the group. Such behavior is evolutionarily stable since although it decreases an animal's chance of survival, it increases the chance of its offspring.

Although it is most obvious in the case of direct offspring, kin selection can operate between any animals that are related. A good example is sharing food between two animals. Imagine there are two types of organisms, one with a gene that causes its bearer to behave altruistically, and another without such gene. Clearly we can see that the altruists will be at a fitness disadvantage by giving out their food to the selfish organisms, but the kin selection supposes that altruists do not share with just anybody, but only with their relatives, who are genetically similar to the altruists. Now, when an organism carrying the altruistic gene shares food, there is a certain probability that the recipients of the food will also carry copies of that gene. This means that the altruistic gene can in principle spread by the natural selection. Although such altruistic gene will cause an organism to behave in a way it reduces its own fitness,

it will boost the fitness of its relative who carry similar altruistic genes, which in overall will increase the number of copies of the altruistic gene found in the next generation, and the incidence of the altruistic behavior itself.

William Hamilton demonstrated rigorously that an altruistic gene will be favored by natural selection when a certain condition, known as Hamilton's rule, is satisfied. The rule is expressed as $rB > C$, where r is the coefficient of the relationship between two individuals, B is the benefit to the recipient of the altruistic act, and C is the cost to the altruist himself, measured in terms of the offspring he could not manage to produce because of his altruistic action (Hamilton 1964). The coefficient of relationship depends on the genealogical relationship between donor and recipient; for instance, a cousin is as close as grandfather but half as close as a sibling. The higher the value of r is, the greater the probability that the recipient of the altruistic behavior will also possess the gene for altruism. The model basically attempts to explain any altruistic behavior in terms of selfish genes, so long as the cost incurred by the altruist is offset by a sufficient amount of benefit to sufficiently close related relatives.

Therefore, kin selection theory predicts that animals are more likely to behave altruistically towards their relatives than towards unrelated members of their species, and that the degree of altruism is positively correlated with the closeness in the relationship. Ever since the theory was devised, many empirical works were done to confirm this prediction. For example, a study done on alarm calls in ground squirrels showed that while squirrels may alert other of the same species to danger, they draw attention to the caller and expose it to increased risk of predation. And such alarm-calling behavior occurred most frequently when the caller and relatives were nearby. Another interesting study done on courtship behavior of wild turkeys showed that a subordinate turkey tends to help his dominant brother put on an impressive team display that is only of direct benefit to the dominant member.

Kin selection theory is often presented as a triumph of the 'gene's-eye view of evolution', which sees organic evolution as the result of competition among genes for increased representation in the gene-pool, and individual organisms as mere 'vehicles' that genes have

constructed to aid their propagations (Dawkins 1976, 1982). Altruism is certainly very anomalous concept from the individual organism's point of view. However, from the gene's point of view, we can understand that gene's ultimate goal is to maximize the number of copies of itself in the following generations, and therefore act altruistically towards other bearers of the same gene as long as the costs and benefits satisfy the Hamilton rule. This may sound like kin selection theory is based on what is so-called 'genetic determinism', the idea that genes rigidly determine or control behaviors. Nonetheless, an 'altruistic gene' in Hamilton's theory simply refers to a gene that increases the probability of its bearer to behave altruistically, not which determines the behavior itself. Kin selection is open to the truism that all traits are affected by both genes and environment as well.

Interestingly, kin selection can be also understood from the individual organism point of view. Although altruistic behavior towards its relatives is detrimental to the organism's personal fitness by definition, it increases what Hamilton called the organism's 'inclusive fitness', which is defined as its personal fitness plus the sum of its weighted effects on the fitness of every other organism in the population, the weights determined by the coefficient of relationship r . Given this definition, the natural selection will act to maximize the inclusive fitness of individuals in the population. Instead of thinking in terms of selfish genes trying to maximize their future representation in the gene-pool, we can think in terms of organisms trying to maximize their inclusive fitness.

The importance of kinship for the evolution of altruism is very widely accepted today, on both theoretical and empirical grounds. However, although kin-directed altruism is the most obvious way of ensuring that altruists and recipients both carry copies of the altruistic gene, what Hamilton's theory points out as the key to the evolution of altruism is the donor-recipient correlation, not the genetic relatedness. This part is theoretically important mainly because it shows kin selection can operate in the absence of ability to recognize kin. As long as an animal behaves altruistically towards other animals that are in fact its relative, Hamilton's inequality is satisfied. What is needed for altruism to evolve is the correlation between donor and recipient

that ensures the recipients of altruism to have a greater than random chance of being fellow altruists. The source of this correlation, whether it is from kinship or closeness in niche, makes no difference to the evolutionary dynamics.

Reciprocal Altruism

A new theory followed by kin selection was the concept of reciprocal altruism, introduced by Robert Trivers in 1971 in an attempt to explain cases of altruism among unrelated organisms, since kin selection clearly could not explain altruism among non-relatives. The basic idea is simple: it may be beneficial to pay the cost for behaving altruistically (giving up one's fitness), if there is a chance that such favor will be returned in the future as a benefit. Let's go back to sharing food example again for simple illustration. Suppose an animal captures a food source which is so plentiful that it cannot consume it all alone before it goes off. Sharing food with other animal costs giving up some of the food that could be consumed now, but for the sake of the possibility that the beneficiary will reciprocate the altruistic action when it is sorely needed, such behavior is worth taking the risk. In such context, the cost of helping is offset by the likelihood of the return benefit, permitting the behavior to evolve by the natural selection.

Reciprocal altruists are definitely taking a risk - since the rewards are expected to come later - they are relying on the good will of the recipient to return the favor when they get the chance. There is no need for any kind of kinship for reciprocal altruism to work, but the conditions required to work is far more complicated than kin selection theory. First, the same individuals must come into contact on regular basis, and there needs to be repeated opportunities for actions that cost the altruist less than they benefit the recipients. It also requires that participants have the ability to recognize each other and accurately recall previous interactions to avoid being exploited by defectors. If individuals were to interact only once in their lifetime, then obviously there is no possibility of return benefit, so there is nothing to be gained by helping another. However, if the conditions were met, then altruists can discriminate any 'cheater' who

has refused to cooperate in the past and reciprocal altruism can evolve. A 'cheater' who refuses to cooperate will not incur the cost of helping others, but at the same time forfeits the return benefits from interacting with others. This evolutionary mechanism is most likely to work where animals live in relatively small groups, increasing the likelihood of multiple encounters.

This concept of reciprocal altruism is closely related to the tit-for-tat strategy in the iterated Prisoner's Dilemma (iPD) game, first introduced by Anatol Rapoport in Robert Axelrod's two tournaments study. In the iPD, a player begins by cooperating and then chooses on trial t the same response the other player has made on trial $t-1$. The players are given two options, cooperate or defect, where the payoff matrix is just like the normal Prisoner's Dilemma game. The fact that the game is iterated rather than one-shot obviously changes the optimal course of action; defecting is no longer necessarily the best option, as long as the probability of subsequent encounters is sufficiently high. In fact, it was found both analytically and empirically that any individual or small group of individuals practicing such reciprocal altruism will have a statistical tendency to receive higher payoffs in the long-run than those who don't practice it. The success of tit-for-tat was widely taken to confirm the idea that with multiple encounters, the natural selection could favor social behaviors that entail a short-term fitness cost, and that reciprocating individuals have greater 'inclusive fitness' than non-reciprocating ones.

Despite the success of the tit-for-tat strategy in reciprocal altruism, there are not many clear-cut practical examples of reciprocal altruism. This is probably because the pre-conditions for reciprocal altruism to evolve are not especially common. One of the most prominent examples would be the blood-sharing behavior of vampire bats studied by Wilkinson in 1984. It is quite common for a vampire bat to fail in hunting for a given night, and this is potentially fatal since bats die if they go without food two nights in a row. So, the successful ones often regurgitate blood to unsuccessful ones, saving the starving fellow bats that have lived together for long period of time in the same community. It was found that the bats tended to share food with their close associates, and were more likely to share with other that had recently cooperated with them, showing how reciprocal altruism exists in nature.

In order for the reciprocal altruism to be played in social interactions, an altruist must make a decision of choosing other altruists to help, but this lead to increasing the probability of there being a genetic similarity between the two participants. In fact, in Wilkinson's research on vampire bats, all instances of feeding happened between individuals of the same group, who are on average cousins, and that no behavior of punishing non-altruistic bats (not a tit-for-tat strategy) was found among them. Such findings indicate that reciprocal altruism may be therefore impossible to separate clearly from kin selection, explaining how patterns of reciprocal altruism could have first become established.

Conceptual Issues in Altruism

The definition of altruism today states altruistic behavior as an action that reduces the fitness of the organism performing the behavior, but boosts the fitness of others. The evolutionary theories described above seems to reconcile the existence of altruism in nature with Darwin's natural selection, but it is hard to deny the impression that these theories devalue what we today think of 'real' altruism is. We ordinarily believe that the truly altruistic behaviors are those done with sole interests of others rather than one's own interest in mind. However, the potential mechanisms struggle to track back the initial establishment of altruism since much 'altruistic' behaviors described in kin selection theory or reciprocal altruism seems to be in fact purely selfish in their origins. Altruistic behaviors towards related members of the group are only 'apparently' altruistic since it is merely a clever strategy devised by selfish genes to increase their representation in the gene-pool. Reciprocity is also a strategic cooperation of 'taking the altruism out of altruism', returning kindness with kindness and hostility with hostility, to procure return benefits in the future - it is just another form of delayed self-interest. In fact, sharing (mutual benefit) and helping (sacrificing) are fundamentally different behavior categories that we should not be baffled.

Then should we be convinced that there is no such thing as true altruism from the first

place? As long as the biological altruism is concerned, we should not be tempted to equate the concept with the everyday meaning of altruism. Biological altruism simply defines altruistic behavior as a sacrifice of fitness but does not take into account of motivating intentions behind performing such actions. If altruism were to be strictly restricted to behaviors that must be performed with conscious intentions, then the vast majority of living creature will not be capable of 'real' altruism nor therefore of 'real' selfishness either. Since the behaviors of animals and insects are mostly driven by instincts rather than consciousness, we do not expect to see true altruism in most animal species, and thus the contrast between 'real' altruism and 'apparent' altruism is not applicable. For any evolutionary explanation of altruistic traits, as Sober and Wilson (1998) note, if one insists on arguing behaviors which evolve by kin selection or reciprocal altruism are really selfish, one ends up reserving the word 'altruistic' for behaviors which cannot evolve by natural selection at all. Besides, there are other conceptual issues such as distinction between altruism and cooperation, weak and strong altruism, and short-term versus long-term fitness consequences that surround biological altruism and make it difficult to pin down the evolution of altruistic behaviors, especially in human nature.

III. Evolution of Cooperation in Human Behaviors

Do theories of the evolution of biological altruism apply to humans? Are we biologically hard-wired to behave in a socially caring manner? The debate over whether altruistic behavior is a socially influenced or genetically predisposed one is still open to arguments. The theories introduced in kin selection and reciprocal altruism provides rational arguments for altruistic behavior in humans, but neither completely explains why humans will engage in such acts. Kin selection only works if the entire world community is seen as one's kin and reciprocal altruism only works if one assumes that the recipients ~~has the resources to return~~ the favor in a finite interaction. These theories are often violated in explaining behaviors that occur in more complicated or restricted environments. We must admit, therefore, that humans

are far more complex species for one to be able to explain their altruistic behaviors just on biological terms.

In fact as for the human behavior is concerned, both biological altruism, defined in terms of fitness consequences, and 'real' altruism, defined in terms of the agent's conscious intentions to help other, seems to be applicable. In general, humans do behave more altruistically towards their close kin than non-relatives, which supports the arguments that such behaviors come from instinctual altruism that are biologically hard-wired just like other animals. Yet we also observe people behaving in a socially altruistic manner due to a connection between empathy and compassion, and such actions are often anomalous from the evolutionary point of view. The ability to imagine one's self in the position of another (empathy) results in a feeling of mutual suffering (compassion), and it is believed that the natural selection has in fact favored humans who are capable of such 'real' altruism over the time. Therefore, even if we accept an evolutionary approach to human behavior, we must take a judicious look at both empirical and psychological approaches to better understand altruism in economic behavior of humans.

Empirical Perspective

It has taken over a century to elaborate on the implications of how evolutionary theories would explain complex phenomena in human behaviors. And as all biologists accept that homo-sapiens is an evolved species, general evolutionary principles - from Darwin's natural selection to Triver's reciprocal altruism - have been applied to human behaviors, which has been quite successful in examining people's tendency to cooperate with the support of many empirical studies based on game theory.

One of the most outstanding empirical researches done in the pursuit of explaining the cooperative behaviors of humans is what now often referred as Axelrod's Tournaments, an extensive laboratory experiment on reciprocal altruism using various strategies in Prisoner's Dilemma game. As mentioned before, the most systematic strategy based on the principles of

reciprocal altruism was found to be the 'tit-for-tat' strategy, which yielded the highest payoff than any other strategies (behaviors) in the iPD. From this study, Axelrod was able to analyze some interesting discoveries about the nature of cooperation. The results from his study have shown that the success in an evolutionary 'game' was correlated with the following characteristics: being nice and fair, but not envious and too clever. In other words, the ways to maximize the benefit from interactions with others are to cooperate from the beginning, be able to fairly reciprocate cooperation for cooperation and defection for defection, but never strive for a greater payoff than other player and don't be tricky.

Aside from Axelrod's inspirational achievement, there are other experiments performed to further investigate the motivations behind altruistic behaviors. A typical experiment that demonstrates people's unselfishness is the so-called 'ultimatum game', which involves two people and ten coins. The first player is given ten coins and instructed to offer some share of that money to the second player. If the second player accepts the division, then both players keep the money. If the second player rejects the division, both players end up with nothing. In a one-shot play of the game, game theory assumes (as do most economic models) individuals are rational and self-interested that the first player should offer the second player only a minimal amount, which the second player will accept because it is better than nothing. This is a fine theory, but unfortunately it is not how people really play the game. When the game is actually played, small offers are commonly rejected (as well for higher stakes), and even in a one-shot game, it is common for the first player to offer a 50:50 split of the original stake. The lesson shown from this game is that people basically like things to be fair, and if they don't perceive what is going on as being fair, they are prepared to suffer in order to punish those they see as the source of the unfairness. This phenomenon is often referred to as 'altruistic punishment.'

In 1986, Robert Dawes set up an experiment to test the reasons people would not contribute in public good game (based on similar set-up to the ultimatum game). In a game where people made decisions to contribute or defect for the public investment, different payoff structures were given to stimulate greed, a desire to free-ride, or fear, frustration towards being

defected by others, from the participants. The results from the experiments showed greed was more important than fear in causing defection, and that by removing the incentive to free-ride (greed), dramatically greater contributions could be made from the subjects than in no fear conditions. Another experiment by van de Kragt proved that one of the most powerful methods for inducing cooperation in the public good game is to permit discussion between subjects, which generates trust between participants and triggers ethical concerns (sanction) that yield utility for doing the right thing, which is making contribution for the whole. From a study by Kramer and Brewer, group identity, whether ethnical or cultural or even organizational, was also found to be a crucial factor in improving the payoffs as a group, providing perhaps the most important basis for altruism to be played within. And as it was later pointed out, since organizations are principal players in modern economies, such loyalty to organizations is essential to the general economic growth in societies.

Behavioral economics experiments demonstrate that people do care about the welfare of other. Contrary to what is often thought, an evolutionary approach to human behavior does not imply that humans are likely to be motivated by self-interest alone. In fact, the important message from these empirical studies is this: the essence of morality is a key factor in promoting benefits for the most, if not all. While there still remain questions unresolved, the game theoretic approach has mostly clarified the conditions required for the evolution and persistence of cooperation, and shown how Darwinian natural selection can lead to complex behaviors, including notions of morality, fairness, and justice. Analyzing and making predictions on human behaviors is never easy, but understanding the role of moral sentiments also aids incorporating such notions into economic analyses.

Psychological Perspective

Search for incentives in human behavior has its long history in the field of economics. During the classical period, economics indeed had been closely linked to psychology. In 1759,

before the notorious *The Wealth of Nations*, Adam Smith argued in *The Theory of Moral Sentiments* that human behavior was determined by the dual-process framework of what Smith termed the 'passions' and the 'impartial spectator'. The passions included drives such as hunger and sex, emotions such as fear and anger, and motivational feeling states such as pain. Smith viewed behaviors are under the direct control of the passions, but believed that people could override passion-driven behaviors by viewing their own behavior from the perspective of an outsider –the impartial spectator – a “moral hector who, looking over the shoulder of the economic man, scrutinizes every move he makes” (Grampp 1948). In *The Theory of Moral Sentiments*, 'impartial spectator' is described as the source of self-denial and self-government that controls passions to 'do the right thing' that coincides with moral virtues and conscience. Smith also recognized, however, that the impartial spectator could be led astray or made impotent by sufficiently intense passions.

The Theory of Moral Sentiments is packed with insights about preferences, using the dual-process framework of the passions and the impartial spectator. His psychological perspective anticipated a wide range of insights regarding phenomena such as loss aversion, overconfidence, altruism, and fairness that indeed have been the focus of contemporary behavioral economics. And even though he viewed sympathy as an extremely unreliable guide to moral behavior, Smith believed it is one of the most important passions that drive human behavior. He noticed that the degree of sympathy to which people feel towards others is positively correlated with the social distance or relationship they share. This actually corresponds to what the kin selection theory states about altruistic behaviors. On the other hand, Smith also observed that if humans were under the control of their passions and preferences, one could expect to observe fluctuations in the level of sympathy they feel, alternating between extreme callousness and remarkable generosity with little logic or consistency governing the transitions. He believed, however, that such fluctuations in sympathy could be moderated by the impartial spectator, which recognizes that “we are but one of the multitude, in no respect better than any other in it” (Smith 1759), leading people to 'do the right thing.'

Although Smith viewed altruism as a somewhat erratic force, he shined more of a spotlight on the role of fairness. He saw that humans have an innate concern for fairness, which is later found to extend to even other primates, and that fairness was the source of the virtue of justice that upholds the whole edifice of society. Moreover, Smith believed the desire for justice is one of the primal natural sentiments hard wired inside to distinguish between altruism and selfishness, rewarding generosity while punishing perfidy. This psychological insight indeed laid the ground work for the search of reciprocal altruism. The impartial spectator also plays an essential role in fairness, by causing individuals to internalize other people's sense of fairness. In his book, Smith argued "there is no commonly honest man who does not dread the inward disgrace of such an action" (Smith 1759).

For Adam Smith, a mixture of concern about fairness (enforced by the fear of negative appraisal by the impartial spectator) and altruism played an essential role in market interactions, allowing trust, repeated transactions and material gains to occur. He described the beginning of market exchange as following: "in a nation of hunters, if anyone has a talent for making bows and arrows better than his neighbors he will at first make presents of them, and in return get presents of their game. By continuing this practice he will live better than before and will have no occasion to provide for himself, as the surplus of his own labor does it more effectually" (Smith 1763). And recent experiments related to behavioral economics have in fact proved that the norms of positive reciprocity often create trust where it has no business flourishing among strangers in one-shot transaction. For example, in simple "trust game", subjects decide how much money to invest, and their money gets tripled. Then a second subject takes the money out and decides whether to keep all or repay some to the original investors. Perhaps surprisingly, most experiments (Berg, Dickhaut and McCabe, 1995; Camerer, 2003) showed people are often motivated to contribute by pure 'warm-glow' altruism even without any expectation for pay back, and such continuous altruistic interactions built on truth eventually stimulate economic growth in market exchange (Knack and Keefer, 1997). It is amazing how empirical study combined with psychological insight can end up explaining economic behaviors and outcomes that theory often

fails to predict, and much credit goes to Adam Smith's two hundred-years-old *The Theory of Moral Sentiments*.

In tracing the history of behavioral economics, reference should be made to the theory of bounded rationality by Nobel Laureate Herbert Simon who explained how people irrationally tend to be satisfied, instead of maximizing utility as generally assumed. In his notion, human beings do not behave optimally in terms of fitness, because they are wholly incapable of acquiring the knowledge and making the calculations that would support optimization. And because of this bounded rationality, Simon argued the fitness of human beings in evolutionary competition is closely related to what he terms as 'docility', the tendency to depend on suggestions, recommendations, persuasion, and information obtained through social channels as a major basis for choice (Simon 1993).

In large measure, we do what we do because we have learned from those who surround us, not from our own experience, what is good for us and what is not, exhibiting a very large measure of docility as a consequence. Simon asserted that behaving in this fashion contributes to individual fitness on average, and social interaction often induces such altruistic behavior in individuals that has net advantage for average fitness in the society. Because those who advise altruistic behaviors are responding to the same social influences as those advised, altruism will survive as long as the cost to individual fitness is less than the value of altruistic acts in enhancing the average fitness of members of the society. Altruism includes influencing others to behave altruistically. As a result, it follows societies that induce altruism in docile individuals will certainly survive in competition with those that do not.

Herbert Simon (1993) urged that today's common assumption that economic actors desire only economic motives is empirically false and that wealth is not even closely linked to individual fitness anymore. On the other hand, human beings are born today even more helpless than in the past, requiring higher degree of docility from society, and the complexities of modern life increase the rewards for acceptance of social influence and, consequently, altruism. Amartya Sen (1997) described people who are always selfishly rational as 'rational fools,'

because mutual choices based only on egoistic payoffs consistently lead to suboptimal outcomes for all involved. Therefore it is necessary that current doctrines in several areas of economics undergo severe revision as motives other than economic gain deserve their appropriate place in economic theories.

The effort to integrate psychological insights with neo-classical economic theory has risen as the role of selfish rationality in economics models came into question by subsequent behavioral economists. However, the majority of economists have still distanced themselves from such psychological perspectives as they continue to reshape the discipline as a natural science, with explanations of economic behavior deduced from assumptions about the selfish nature of economic agents. The concept of *homo economicus* (the concept of humans as rational and self-interested actors) is still prevalent, and the psychology of this entity is believed fundamentally rational. However, this well-intentioned yet careless advance is the cause of the appearance of unintended and unforeseen errors in the operation today's economy.

IV. Failure of Neo-classical Economics

As mentioned earlier, it is impossible to distinguish altruism from selfishness in terms of utility. However, if one defines altruism as a sacrifice of fitness, it becomes possible to determine empirically (in principle) which choices are selfish and which are altruistic. In search of empirical explanations for altruistic behaviors based on evolutionary theories and psychology, it was found that fitness arguments no longer imply that desire for economic gain is the dominant human motive and that much emphasis should be put on to other motives like altruism and group identity.

Nevertheless, most of economic systems prevalent today are still built on numbers, not people, resting on a demonstrably untrue assumption of selfishness. As Nobel peace prize laureate Mohammad Yunus once mentioned, "Economics text-books create the mindset, and mindsets create the world. I think economics has mistreated this world. It got us into a lot of

troubles and many human tragedies. For one thing seeds of poverty are planted firmly in the pages of economics text-books.” New and revisionary minded, yet fast-emerging economists who attempt to overcome the deficits in classical economics theory and teaching, brand the mainstream economics as ‘autistic’ due to an over-simplistic view of the world, an excessive reliance on mathematics, and a refusal to integrate with other disciplines. As its consequences for the world and society become clearer, neo-classical orthodoxy is beginning to come under attack greater than ever since.

Problems of the Neo-classical Economic Models

For a long time, capitalism has been effective at coordinating individual production and distribution of material wealth. It did so in a decentralized fashion that allowed people to work creatively and motivated them to provide for one another. It was widely regarded as fairer than older systems such as feudalism. However, the last few decades has seen the coming of the globalized information age, where goods and services worldwide became ever more information-based. And as the economy becomes increasingly virtual, capitalism came to show itself increasingly unsatisfactory since the traditional pricing system that favor competition over cooperation is ill-suited and tremendously inefficient for the cost structure of information-goods. As a consequence, the shift of economic paradigm in modern markets has created a combination of factors that are causing wealth to polarize at an exponential rate. Leaving no room for human values, capitalism has been exploited under the obsession for profit-maximization, and rent-seeking activity (lose-lose interactions in which real resources are expended in an effort to capture money from others) has now come to dominate the world’s economy. An increasingly small proportion of the world owns an increasingly large proportion of its wealth, at odds with the basic human value of fairness and undermining its legitimacy.

Capitalism is continuing to show itself unable to adapt to the world’s changing circumstances, and is built on a money system which promotes strife and competition. Under

capitalism, economists have been forced to either avoid judgments of human nature, or make assumptions that appear excessively harsh. Because economic gain is assumed to be the supreme motive of human behavior, mathematics has replaced morality in the sense that profitable activity thrives and all other activity is suppressed. However, we recognize that human motives change over time, responding to experiences and the surprises of history. Individuals do not form their preferences in isolation from other individuals, but in response to both public events and information that is widely broadcasted. In today's world, all nations and all people are more inter-connected and inter-dependent than ever.

Perhaps capitalistic activities have been financially productive over some periods of time, but the problems arisen from them have been socially destructive at the same time, eliminating the true human virtues in the socially domains. For example, love is fundamental to human welfare, yet because it leads to activities such as sharing, caring, and giving away, it is stigmatized to run counter to what capitalists defines 'economic progress.' So those activities promote love have been suppressed by capitalism, while those which promote revenue maximization are praised, rewarding selfishness but punishing altruism. Moreover, by the pursuit of efficiency for profit maximization, the 'free market' has eliminated any that pursue goals other than maximizing their profits, ironically leading to greater inefficiency in allocating resources and services for financially profitable businesses. There are tons of cases like notorious Enron incident out in the world economy that it is perhaps needless to state the point that failure of capitalism covers not only economical crisis, but also terrible psychological and social damages in our society, like breakdown of trust or credit between economic agents.

One of the biggest problems stemmed from such capitalistic ideas in modern economy is the centralized money system it lies on, and the greatest single fallacy of the current money system is its zero-sum nature. Yes, the fundamental flaw in the money system is that it is not designed to distinguish activity which creates value (profit-seeking) from that captures value (rent-seeking), but it is the zero-sum nature that actually models every transaction as win-lose cases, rewarding competition rather than cooperation. And because of the long-believed notion

that money has absolute value, not relative, people strive to become more financially secure compared to others by depriving what others have, which has appeared to be successful only by few throughout the history. However, if we were to really believe that human beings are utility-maximizing agents, not just profit-maximizing, then the contemporary economic systems should be under reexamination to embrace human nature to collaborate and assign comparable weights to other motives beside money, which is often referred to as 'the source of all evil.' In fact, according to George Lowenstein (2005), Adam Smith insightfully remarked that human beings are motivated more by ego than by any kind of direct pleasure from consumption and, though they don't anticipate it, ultimately derive little from pleasure from either.

Many tower blocks built in the 60's and 70's were conceived from sound economics and architectural models, but later proved useless because they were designed with little thought about the community life of the tenants. A social and financial system with little thought to human relationships is just as flawed. As an appropriate alternative to devastating capitalistic economic system, we should now pay attention to the altruistic economics, a new system that rewards generosity, not selfishness, and evaluates human interactions that pre-suppose people love one another. By connecting people with consequences of their actions, it aims to encourage the spirit of sharing and giving within them, which has been so long repressed by the centralized, profit-maximizing, zero-sum money system.

V. Economics of Altruism

Economic system of altruism is designed to encourage the positive, caring side of human nature by discriminating altruism from selfishness. Altruistic economics assumes that people's well-being is related to that of their friends. Like classical economics, it assumes that people maximize their welfare. Unlike classical economics, ~~everyone's well-being is uniquely~~ dependent on their sympathy for other specific individuals, so that our self-interest is counter-balanced with concerns for the welfare of friends. In altruistic economics, wealth is not

dependent on what one has accumulated for oneself, but by how his/her actions have affected the well-being of other people. Working outside of the capitalist system for the benefits of others, it has many innovative features, such as non-zero sum nature and multiple value system that promotes more essential allocation of resources and allows economic agents to get away from win-lose interactions.

Basic Principles and Concepts Behind

The fundamental idea of altruistic economics is that people's care for one another is a vital aspect of their preferences and is definitely worth modeling. In order to make this happen, we must first remember that money alone does not, and should not, define any economic activity as 'profitable' and that human behavior and social interaction are not solely motivated by economic gain. With that in mind, people must openly publish their values (not monetary) and preferences so it can be accessed by others, probably their friends, interested in taking their feelings into account. Moreover, other key principles here are that people have to trust their friends and people are completely free about how they interpret one another's data. Therefore, the altruistic economic model is built on a network of relationships aroused by emotional connections between people, where the strength of these relationships are dependent on what is called sympathy value.

As Adam Smith has notified, sympathy is indeed one of the most important passions that drive human behavior that can lead to any form of altruism. In altruistic economic system, sympathy has been quantified to represent the strength of care in relationships involved, denoted by s ranging from 0 to 1. Easy way to understand the role of sympathy is to compare with basic idea in kin selection theory. In kin selection, it is assumed that the desire for greater fitness initiates animals to behave more altruistically towards those who are genetically more similar to the altruists. Similarly, altruistic system of economics also assumes that closer the relationship is, greater altruism and cooperation are flourished between agents, and that this is not due to the

interest of fitness, but by the sympathy they share. Simply putting, sympathy is the greatest number of units of a resource you are prepared to sacrifice to prevent your friend from losing one unit. If complete sympathy ($s=1$) were to exist between the parties, which are apparently common in a parent-child relationship, then both parties would be indifferent to resources that flow between them. However assigning single s value to each relationship is a crude approximation since sympathy is likely to vary according to the resources involved in the relationship and will not be constant over time. In general, we often see that there are limits on the resources that altruism could be played between interactions, since the more work one do for another, the more reluctant one may be expected to be to do more, lining with the law of diminishing returns.

Another key advantage of altruistic economics is the use of new value measuring system. In the capitalistic system of economy, single-value scoring method is used to represent the value imbalance between two parties in a transaction. This is the amount of money transferred between them. In a traditional buyer-seller situation, the buyer wants the price as low as possible while the seller wants the price as high as possible; the interests of the parties are in direct opposition to one another. This conflict is inevitable because whether it uses a competitive or a cooperative metric, no one-dimensional evaluation system can properly represent the feelings of both parties, because utility is comprised of many different preferences and incentives. Current money system fails to capture enough information about what is going on in the transaction. Without taking into account of other factors involved in interactions, single-value scoring simply entails price negotiation and deception, encouraging the strong to exploit the need of the weak and thus distorting relations between people.

Nonetheless, a multiple-value scoring system is a very simple concept: all participants in an interaction make independent evaluations on the utility they derived from it. And what it means as independent evaluation is that people ~~have freedom to register how different~~ transactions affect their welfare, allowing effective distinction between value created and value transferred. For an ease of illustration, consider again the case of buyer-seller situation with a

little tweak. Seller expresses the expected utility from getting rid of the surplus good and buyer indicates the expected utility from procuring the needed good, where the value of the transaction is stated publicly. Remember, the single value scoring with price is not used. Under the assumption that participants want to behave altruistically toward each other, there is no need for buyer and seller to agree on a price for transaction since they both want the same thing: greater amount of value created by the transaction. Although it may sound unfamiliar, it is more effective than single-value scoring, because it does not require agreement on a single price, something that is particularly troublesome where a large power imbalance exists between trading parties. There is no systematic conflict in this interaction, and this permits interactions to be non-zero sum.

Altruistic economics allows accurate recording of win-win (or lose-lose) interactions, since it does not enforce zero-sum interaction. Its multi-dimensional pricing system is a straightforward way to get away from win-lose interactions, allowing all parties of a transaction to independently record their feelings about what goes on. For instance, let's say A spends one night taking care of B's son, for B is out of town. In traditional economics A will be judged as a 'loser' and expect to be compensated with money for being so. However, A in fact enjoys babysitting and scores a positive utility from the interaction. Win-Win interactions are such ones that both parties see as beneficial and human interaction is indeed no a zero-sum game. Previously suggested and concluded by many preeminent economists, a society with many win-win interactions is found to be healthy and even more competitive compared to self-interested group of people since both parties get to boost their welfare and benefit the society as a whole. In such a society, people are encouraged to love each other, promoting cooperation and giving that generate abundance in utility, both emotional and material.

Pros and Cons of the Altruistic Economics

As the economic sphere swells, ever more activity are brought under zero-sum, leading

to rapid increase in lose-lose activity such as rent-seeking that results in destructive and inefficient outcomes. To magnify the importance of altruistic interactions, the first thing we need is an economic system that can identify them. Altruistic Economics is designed with a multiple value scoring system, so everyone has a chance to independently state their perception of the value of a transaction. Composed of various principles and innovative concepts, altruistic economics aims to reject the current monetary system and build models in which people can contribute to the well-being of others. To get rid of a short-sighted, money-obsessed view of what constitutes 'profitable' activity, we need an alternative system of economics that reflects this.

Therefore in altruistic economics, sympathy is a very important factor that allows other to evaluate who you are. In order to succeed in this system, others are not considered merely as 'someone', but as those who you should really care about, and it is the sum of independent evaluations on you that actually grants credit in interactions with other. E-bay is a good example that illustrates the role of independent evaluation. In e-bay, even though money works as a medium that completes the deal, the rating of your credibility is considered highly important in initiating the deal and carrying it out. What this means is that in altruistic economy, centralized money is no longer as important as the independent evaluations from others that are involved in the amount of value created by the transaction. Because it is not possible to coerce others for better evaluations, higher transparency and lower exploitation of credibility are achieved consequently, and such interactions result in a non-zero sum game that exposes how people feel in the network. For instance, think of a woodcutter who works in a forest to provide wood to a lumber merchant. In traditional money system, such interaction would only consider the price the wood is sold for and only the merchant and woodcutter have the opportunity to influence the evaluation. But in fact, although the woodcutter is given credit by the merchant, the action causes him to lose credit from anyone interested in the welfare of the forest. Altruistic economics is basically a form of information network. It does not grant authority to any particular person, but gives everyone the opportunity to express what they feel about the things that are going on in the world.

However, just like all economic models do, altruistic system of economics is not perfect. Firstly, it is based on the great supposition and hopes that people love each other, care what others feels, and are willing to sacrifice oneself to create greater harmony with people in the society. It is still vulnerable to free-riders and defectors who try to convey false information through interactions and take advantage of altruists. Although it may have sound reasonable in simple illustrations, the application will become very complicated if large group of participants were to be involved in transactions, which is true in real life. Without trust, this new system is doomed to malfunction. However, life is not a zero-sum game. Society is made up of individuals that live in, and a group of harmonious individuals is what constitutes a society. Without benefiting individuals, society cannot be maintained, and without benefiting the society, individuals cannot survive. It is high time to start thinking altruistically, working together to heal the world.

VI. Conclusion

Born out of frustration with a deadening orthodoxy that denies that people care for one another and encourages an instrumental view of other humans, alternative models of human interaction are emerging very rapidly. Many successful cases like YouTube and Wikipedia that incorporated such notions have proved themselves effective that altruistic economic models are neither surreal nor idealistic. Millions of enlightened souls worldwide are conducting 'grassroots' campaigns to promote humane alternatives that value human welfare ahead of equations.

In grassroots economy, each individual become a player in creating the products, services, and experiences that everyone can enjoy. In the era of information age, you have the power and a voice in making decisions that affect how stuff gets made, not just the big companies that could organize people, money, resources, and ideas effectively in large scale to provide goods and services. Grassroots campaign asserts that anyone with a cell phone, laptop, and internet connection can share ideas, form communities, collaborate, and produce. In the bottom-

up model, one can participate by contributing ideas, voting on design, sharing resources, and acting collectively in a way that everyone's action add up to something bigger, to something that could not be accomplished alone. Connecting everyone together into the network of exchange, grassroots economy can change a small consumer into producer, creator, and contributor to economic activity that used to be reserved for the people and companies who had the most control. The mindset that 'giving is good' is important because contributing to collective efforts and sharing resources can lead to new, greater opportunity and change.

The goal of such movement is to create a system that rewards generosity. In the world of altruistic economy, one's value should no longer be valued by what he or she has, but by what you can contribute and create. Money will be still important, but ideas, evaluations, creativity, and contributions that can generate greater benefit as a whole should be counted and tracked to reflect one's power as an economic agent. Fair distribution of resources and money is a key to the better future.

Commentary

The concept of *homo economicus* is perhaps the origin of all the economic anomalies and problems present today. Without thinking outside of the box, economists will fail to explain and predict human behaviors and social phenomena that are becoming increasingly complicated and absurd, which could be easily understandable and adjustable if we were to accept that people are multidimensional and humane agents. Men do not fit into a false dichotomy of selfishness and altruism.

There is a famous parable in the Bible called "the workers in the vineyard." The story goes like this: there was a landowner who went out early in the morning to find workers who would work in his vineyard. He agreed to pay them one denarius (old currency) for the day and sent them into his vineyard. About the third hour, he went out and saw others standing in the marketplace doing nothing, so he sent them to work in his vineyard, promising to pay whatever is

right. He went out again about the sixth hour and the ninth hour and did the same thing. About the eleventh hour when the day was almost over, he went out and found other workers still standing around without any work, so he also sent them to his vineyard to work. When evening came, the owner of vineyard called the workers and paid equal wage of one denarius to everyone, beginning with the last one hired and going on to the first. However, those who came first were not satisfied with the same wage they earned compared to others who came later and grumbled that the owner was being unreasonable. So to them the owner says "Friend, I am not being unfair to you. Didn't you agree to work for a denarius? Take your pay and go. I want to give the man who was hired last the same as I gave you. Don't I have the right to do what I want with my own money? Or are you envious because I am generous?"

At the first sight, this anecdote seems like a pure non-sense, illustrating unreasonable behavior of dictator-like owner. The important message implied in the parable is, however, that the owner's primary interest of owning the vineyard was not to make profit out of it, but to hire those who are jobless and pay them for their labor so that they don't go back home empty handed. To the owner, the vineyard was not his, but for the workers. This story is in fact a description of the kingdom of heaven by Jesus Christ from the bible. The love for mankind is what brings down heaven to the world we live in.

References:

- Axelrod, Robert**, *The Evolution of Cooperation*, New York: Basic Books, 1984.
- Berg, Joyce, John Dickhaut, and Kevin A. McCabe**, "Addiction and Cue-Triggered Decision Processes," *American Economic Review*, 1995.
- Camerer, Colin F.**, *Behavioral Game Theory: Experiments on Strategic Interaction*, Princeton: Princeton University Press, 2003.
- Camerer, Colin and Richard Thaler**, "More Dictator and Ultimatum Games," *Journal of Economic Perspectives*, 1995.
- Darwin, C.**, 1859, *On the Origin of Species by Means of Natural Selection*, London: John Murray.
- Dawes, Robyn M., John M. Orbell, Randy T. Simmons, and Alphons J. C. van de Kragt**, "Organizing Groups for Collective Action," *American Political Science Review*, 1986.
- Dawes, Robyn M., and Thaler, Richard**, "Anomalies: Cooperation", *Journal of Economic Perspectives*, Vol. 2, No. 3, 1988.
- Dawkins, R.**, 1976, *The Selfish Gene*, Oxford: Oxford University Press.
- Dawkins, R.**, 1982, *The Extended Phenotype*, Oxford: Oxford University Press.
- Frank, Robert**, "If Homo Economicus Could Choose his own Utility Function, Would He Want One with a Conscience?" *American Economic Review*, September 1987.
- Hamilton, W. D.**, 1964, "The Genetical Evolution of Social Behavior I and II", *Journal of Theoretical Biology*, 7: 1-16, 17-32.
- Hamilton, W. D.**, 1970, 'Selfish and Spiteful Behavior in an Evolutionary Model', *Nature*, 228: 1218-1220.
- Hamilton, W. D.**, 1972, 'Altruism and Related Phenomena, mainly in the Social Insects', *Annual Review of Ecology and Systematic*, 3: 193-232.
- Knack, Stephen and Philip Keefer**, "Does Social Capital Have an Economic Payoff? A Cross-Country Investigation," *Quarterly Journal of Economics*, 1997.
- Kramer, R. M., and Marilyn Brewer**, "Social Group Identity and the Emergence of Cooperation in Resources Conservation Dilemmas." In H. Wilke, D. Messick, and C. Rutte, eds., *Psychology of Decision and Conflict. Vol. 3. Experimental Social Dilemmas*, Frankfurt Am Main: Verlag Peter Lang, 1986.
- Nava Ashraf, Colin F. Camerer, and George Loewenstein**, "Adam Smith, Behavioral Economist," *Journal of Economic Perspectives*. Vol. 19, 2005.

- Sen, Amartya K.**, "Rational Fools: A Critique of the Behavioral Foundations of Economic Theory," *Journal of Philosophy and Public Affairs*, 1977.
- Simon, Herbert A.**, "Altruism and Economics," *American Economic Review*, Vol. 83, No.2, *Papers and Proceedings of the Hundred and Fifth Annual Meeting of the American Economic Association*, 1993.
- Smith, Adam**, *The Theory of Moral Sentiments*, Oxford: Clarendon Press, 1976. (Originally published in 1759.)
- Smith, Vernon L.**, "The Two Faces of Adam Smith," *Southern Economic Journal*, 1998.
- Sober, E. and Wilson D.S.**, 1998, *Unto Others: The Evolution and Psychology of Unselfish Behavior*, Cambridge MA: Harvard University Press.
- Sober, E.**, 1988, 'What is Evolutionary Altruism?' in *New Essays on Philosophy and Biology (Canadian Journal of Philosophy Supp. Vol. 14)*, B. Linsky and M. Mathen (eds.), Calgary: University of Calgary Press.
- Thaler, Richard**, "The Ultimatum Game," *Journal of Economic Perspectives*, 1988.
- Trivers, R.L.**, 1971. 'The Evolution of Reciprocal Altruism', *Quarterly Review of Biology*, 46: 35-57
- Trivers, R.L.**, 1985, *Social Evolution*, Menlo Park CA: Benjamin/Cummings.
- Van de Kragt, Alphons J. C., John M. Orbell, and Robyn M. Dawes**, "The Minimal Contributing Set as a Solution to Public Goods Problems," *American Political Science Review*, 1983.
- Wilkinson, G.S.**, 1984, 'Reciprocal Food Sharing in the Vampire Bat, *Nature*, 308: 18-184.
- Wilson E. O.**, 1975, *Sociobiology: the New Synthesis*, Cambridge MA: Harvard University Press.
- Williamson, Oliver E.**, *The Economic Instructions of Capitalism*, New York, 1985.

"Altruist International". *Altruist International*. 2010

<<http://www.altruists.org/about/altruism/>>.

"Biological Altruism". *Stanford University*. 2010

<<http://www.seop.leeds.ac.uk/entries/altruism-biological/>>.

"The Evolution of Cooperation". *Wikipedia*. 2010

<http://en.wikipedia.org/wiki/The_Evolution_of_Cooperation>.

