Evolutionary Psychology and Business Ethics Research

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ABSTRACT: In this article, we describe evolutionary psychology and its potential contribution to business ethics research. After summarizing evolutionary theory and natural selection, we specifically address the use of evolutionary concepts in psychology in order to offer alternative explanations of behavior relevant to business ethics, such as social exchange, cooperation, altruism, and reciprocity. Our position is that individuals, groups, and organizations all are affected by similar natural, evolutionary processes, such that evolutionary psychology is applicable at multiple levels of analysis (e.g., individual and group). We introduce a variety of experiments and instruments employed by evolutionary psychologists to illustrate how ethics-relevant cultural norms and practices evolve and are regulated, and to raise the prospect that these experiments and instruments can be useful in future business ethics research.

INTRODUCTION

DESPITE EXTENSIVE EFFORTS BY SCHOLARS in various fields to understand moral behavior, Reynolds and Ceranic recently observed that "the quantity and quality of knowledge that we have acquired about why individuals act ethically and unethically is incredibly low," and they argued that empirical ethics researchers must make "significant changes in our overall approach to our research" (Reynolds & Ceranic, 2007: 1610). Some researchers have looked to the neurosciences for advances in the explanation of ethical behavior (e.g., Reynolds, 2006; Salvador & Folger, 2009). In this article, we review the potential contribution to the social scientific study of organizational ethics from a different (though not entirely unrelated) approach to understanding ethical behavior: the evolutionary approach. Specifically, we review theories and insights from evolutionary psychology, and then consider how an evolutionary approach might inform business ethics research at different levels of analysis. In essence, we rely on an evolutionary approach to provide some underlying assumptions concerning human behavior that in turn can be utilized in business ethics research. Our approach is in keeping with other recent efforts to incorporate biological evolution into the organizational sciences (Ilies, Arvey, & Bouchard, 2006; Nicholson & White, 2006; Pierce & White, 1999; Saad, 2006). If human nature is profoundly affected by the evolutionary history of our species (Nicholson, 1998), it is reasonable to expect that evolutionary theories can provide clues into behavior within organizations.

Some biologists have suggested that evolutionary theories provide opportunity for business ethicists to understand and thus "fortify the other-oriented tendencies

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of human beings—our tendencies toward sympathy, reciprocity, and loyalty—and to counter our destructive tendencies, such as within-group violence and cheating" (Flack & de Waal, 2004: 23). The relevance of biological perspectives (including both the neurosciences and evolutionary theory) to morality is rooted in the belief that ethics in some way develops from the evolutionary forces present in human life (Fort, 2004). Evolutionary approaches provide the potential for a more integrated approach to understanding human behavior, in which socio-cultural phenomena are seen as arising from or influenced by natural selection pressures facing our ancient ancestors. Thus evolutionary approaches can take into account both nature and nurture. Our analysis follows this pattern; our view of human behavior reflects both the social embeddedness and biological nature of human beings, and we offer our analysis as a representative strategy for finding common ground between evolutionary psychology and socio-cultural explanations of ethical behavior in the organizations. Examined together, social scientific and evolutionary perspectives can provide greater insight into ethical and unethical behavior than is provided by focusing solely on socio-cultural, conventionally social scientific models of behavior. In this review, we discuss the novel ways in which evolutionary psychology, in particular, can provide insight into phenomena relevant to business ethics. It is our position that individuals, groups, and organizations are all affected by similar natural, evolutionary processes. Thus, we also indicate how evolutionary psychology is a useful approach to viewing behavior in organizations at different levels of analysis.

Our discussion is structured as follows: We begin with an overview of the main theories of evolutionary biology and natural selection, walking through the major principles of evolutionary theory which form the basis of evolutionary psychology. In part 2, we describe the evolutionary psychology approach to social exchange relationships. We apply evolutionary psychology primarily in the context of ethical decision making in individual-level and group-level exchanges between contracting partners. This section starts with an explanation of the reasons cooperation was important to our evolutionary ancestors. Then, we discuss how reciprocally altruistic behavior became a favored and stable evolutionary strategy, even among non-kin individuals. This leads into our discussion of the main elements of social exchange theory as it is envisioned by evolutionary psychologists, including the role of cheating detection circuits in the brain, and the punishment of rule violators in dyadic relationships. In part 3, we build on the notion of excluding from future exchanges persons who defect from social exchange rules, so as to better understand the more general sanctioning of cheating (i.e., unethical) behavior. This, in turn, requires attention to the concept of strong reciprocity (taken from evolutionary economics) with respect to individual selection and group-level selection. Relying on evidence concerning individuals' tendencies to punish rule violators in social exchanges, we also present a case for the formation of cultural norms in similar fashion. We begin the final part of the article (part 4) by describing some of the most commonly used empirical research tools in evolutionary psychology, and their potential application to business ethics research. Finally, we end with a discussion of further future research possibilities in business ethics using evolutionary psychology, and suggest the potential for such an approach to provide a unifying framework for ethics research.

PART 1. THEORIES OF ADAPTIVE FUNCTION: NATURAL SELECTION AND EVOLUTIONARY BIOLOGY

Natural Selection

Evolutionary theory, as originally conceived by Lamarck and Chambers in the early nineteenth century and later developed by Charles Darwin (1958), describes a process by which species are continually modified and developed. Darwin himself referred to his theory as a doctrine of "modification" (445). In *The Origin of Species*, he implied that all living organisms, including humans, are designed through an accumulation of features over time. He envisioned a "tree of life," such that while modifications in species accumulate through generations, a new branch on the "tree" signifies an altogether different species. In this sense, Darwin believed his theory to be progressive—organisms further up on the tree of life were thought to be more complicated and more highly developed than organisms that appeared on the tree's earliest branches (Hull, 2002).

Once Darwin provided evidence that species evolve, his attention turned to the mechanisms by which evolution is driven. To begin with, it must be understood that evolution is an adaptive theory: features of living organisms are the result of adaptations to their environment (Futuyma, 1979). In other words, "species exist because only certain arrays of forms are adapted to the environment they occupy" (Ridley, 1985: 93), and adaptation indicates a successful design for life at a certain moment in time. In order for a species to adapt to its surroundings, individual members and groups of members must be able to survive the conditions facing them. Herbert Spencer coined the phrase "survival of the fittest," which came to mean that only organisms capable of exploiting their environment (often in direct competition with other species' members) were able to sexually reproduce themselves and thus sustain the species (Hull, 2002). When reproducible physical traits develop that increase the likelihood that their possessor survives the trials and tribulations of the environment and is therefore able to reproduce, adaptation has occurred (Ridley, 1985). The mechanism that Darwin deemed responsible for these changes in the blueprints of species is *natural selection.* Darwin described the importance of natural selection by referring to the adaptive advantages which result from the process.

> [A]s all the inhabitants of each country are struggling together with nicely balanced forces, extremely slight modifications of the same kind would often still further increase the advantage, as long as the species continued under the same conditions of life and profited by similar means of subsistence and defence. (Darwin 1958: 89)

In order to better understand the unique designs that were favored by natural selection and which may be relevant to understanding ethical behavior in the modern world, we now discuss the environmental conditions facing our ancestors in the Pleistocene Period—the period of natural history dating back 1.5 million to 11,000 years before the present. It was during this period that the last major glacial progression ended and Homo sapiens spread all over the globe. The events of the Ice Age had a major impact on the distribution of species on the planet, as well

as on the major characteristics of the human species as a whole (Futuyma, 1979). The study of the structures formed during this time period in human history is the mission of evolutionary biology.

Evolutionary Biology

Evolutionary biology studies the sets of processes that dictate how reproducing organisms are governed by natural selection. These processes determine the form of human and other beings (Tooby & Cosmides, 2000). Evolutionary biology also identifies useful adaptations for the survival of a species, and the changes that have proven less useful and thus de-selected over time. To deal with adaptive problems, certain structures are selected, enabling members of a species to cope with their environment. In other words, evolution selects for structural forms. These forms facilitate certain behaviors that have survival value to the individual. Features that permit the organism to reproduce are considered successful. However, evolutionary biology does not directly create specific behaviors. (Wilson, 1993).

Evolutionary biologists infer the adaptive problems facing our Pleistocene-era ancestors by examining the physical structures that would be needed to solve those survival problems. In this sense, form can be seen as following function. Survival problems can often be solved in several different ways, however. Nonetheless, the "more precisely you can define the goal of processing—the more tightly you can constrain what would count as a solution—the more clearly you can see what an adaptation capable of producing that solution would have to look like" (Cosmides & Tooby, 2000: 1259). Evolutionary biology thus "constitutes . . . a foundational organism design theory, whose principles can be used to fit together research findings into coherent models of specific cognitive and neural mechanisms" (Tooby & Cosmides, 2000: 1186). In particular, natural selection processes are seen as the basis for brain structure (Gaulin & McBurney, 2001). Physical forms of the circuits in the brain evolved from the functions they serve for the organism that possesses them. By "providing the functional engineering specifications to which human brains were built to conform," evolutionary biology can help in understanding the cognitive architecture of the brain (Tooby & Cosmides, 2000: 1186).

As is commonly known, the gene is the basic entity by which variations in form relevant to evolution are reproducible. Specifically, a gene is "any portion of chromosomal material that potentially lasts for generations to serve as a unit of natural selection" (Dawkins, 1976: 28). Genes dictate the structure and function of the organisms which house them. The organism is essentially a gene's "survival machine," in that a gene's survival depends on the survival success of the organism in which it lives. The success of genes in replicating themselves across future generations depends on the survival machine's survival success: genes can perpetuate themselves if they build successful survival machines, inasmuch as organisms that survive are able to reproduce and thereby promulgate their genetic material.

Evolution is best thought of, then, in terms of gene competition. Genes are programmed to replicate themselves. They are merely instructions that are able to be copied, and have no direction or purpose, per se, beyond this replication (Dawkins,

1976), which in turn is only possible if host organisms survive the adaptive challenges facing them and are able to reproduce. So, evolution is not technically at the organism level of analysis; it is at the genetic level.

PART 2. THE EVOLUTIONARY PSYCHOLOGY APPROACH APPLIED TO INDIVIDUAL-LEVEL SOCIAL EXCHANGE RELATIONSHIPS

The Evolution of Cooperation

Evolutionary psychology represents one particular area of evolutionary studies which is amenable to application to research in business ethics. In particular, the idea of "inclusive fitness" provides an explanation for the evolution of cooperation among genetically related organisms.

The theory of inclusive fitness (Hamilton, 1964) purports that natural selection will favor the evolution of mechanisms by which people will help close kin more than distant kin, and distant kin more than strangers. As noted, the success of a gene depends on its propagation, which occurs when individual organisms are able to reproduce and thereby replicate their genetic material. However, inasmuch as genetic material may be shared across individuals, a gene's success in propagation may also be related to the extent to which these individually distinct but genetically related organisms act to promote the survival (and thereby facilitate the reproduction) of each other. From this perspective, altruistic behavior is seen as a mechanism that occurs among genetically related individuals such that the survival fitness of one individual is increased by the sacrifice of the other. Fitness is inclusive rather than individual: individuals increase their ability to pass on their own genes by acting to increase the fitness of others who share those genes. In order to effectively address the question of how altruism between non-genetically related individuals is adaptive, it is best to first outline the theory and implications of the kind of cooperation that occurs between individuals who *are* genetically related.

To illustrate the genetic benefits of inclusive fitness, imagine a scenario in which one of our ancestors is in a position to share a limited food with other members of the tribe. Three of our ancestors, Person A, Person B, and Person C, have just returned to their community, each with the carcass of a small animal. They notice several hungry people, ranging from close kin to distant relatives to complete strangers. Since they each only have one portion remaining of the carcass, they can each only help one person. Person A decides to give her extra portion to her young first cousin with whom she shares only 12.5 percent of genetic material. (These percentages are merely used to illustrate the current example, and are not intended to be accurate representations of genetic transfer.) Her cousin, as a result of the access to a much needed protein, goes on to thrive and reproduce, thereby passing on to each of her children a paltry 6.25 percent of Person A's genetic material. Person B, meanwhile, decides to give his extra food to his sister (with whom he shares 50 percent of genetic material). And she consequently goes on to thrive and reproduce, passing on to each of her children a modest 25 percent of Person B's genes. Person C, however, decides to give his portion to a male adult stranger (with whom he shares no genetic material). All things being equal, the strongest genetic

benefit goes to Person B (rather than to Person A or to Person C), for indirectly increasing the likelihood that a higher percentage of his genetic material is present in future generations. Person A comes in just under Person B, and Person C is the clear genetic loser for indirectly increasing the likelihood that a higher percentage of *other* people's genes are expressed in future generations.

A genetic account of evolution thus can explain cooperation among related individuals; understanding how this kind of discriminating but still "other-regarding" behaviors came to be one of our evolved psychological mechanisms is explained using the same kind of scenario as above, wherein Person B's "helping closer relatives" genes are going to get passed on in greater numbers than Person A's "helping more distant relatives" genes, and Person C's "helping strangers" genes are not going to get passed on at all. But how and why, then, does altruism among the latter group—strangers—exist in society?

Reciprocal Altruism

The theory of reciprocal altruism proposes that mechanisms for providing benefits to non-relatives will evolve as long as the help is reciprocated at some point in the future (Axelrod, 1984; Trivers, 1971; Williams, 1966). The crux of this theory is that each party ultimately receives more in return than it costs to deliver the benefit. Economists call this mutually beneficial activity "gain-in-trade." Inasmuch as these gains-in-trade increase the likelihood of survival of reciprocating individuals, such reciprocity will result in cooperating individuals out-reproducing those who act selfishly, thereby resulting in the spread of reciprocally altruistic genes to future generations. Dawkins suggests that inclusive fitness and "selection in favor of reciprocal altruism may have acted on human genes to produce many of our basic psychological attributes and tendencies" (Dawkins, 1976: 191).

One of the main problems with the functional utility of reciprocal altruism is that most of the exchanges do not occur simultaneously. That is, normally, the giver has to trust that the receiver will reciprocate at some point in the future. If the receiver never reciprocates, the giver has suffered a cost, but the receiver has gained a two-fold benefit—gaining immediate utility plus reproductive advantage. Because these benefits are manifested in increased reproductive capabilities, over evolutionary time, cheaters will out-reproduce cooperators, leading to a population made up of cheaters. But because we don't have a population full of cheaters, we must have evolved a mechanism to detect and avoid cheaters. If so, cheaters would have been selected against because they were not chosen as exchange partners and did not gain the associated benefits in trade.

The Social Contract Theory: The Cosmides and Tooby Approach

Cosmides and Tooby (2000), among others (Axelrod & Hamilton, 1981) have developed a social contract theory to address the problem of cheaters. With reference to the hard-wiring of human brains (Tooby & Cosmides, 1992), Cosmides and Tooby propose that humans have evolved five cognitive capacities to engage in successful exchange relationships: We must be able to recognize many different individuals;

remember the history of interactions with them; communicate our values, desires, and needs to others; recognize the values, needs, and desires of others; and represent the costs and benefits of a variety of items of exchange. Additionally, evolutionary psychologists believe that humans have evolved not only the ability to detect cheaters, but the ability to detect altruists, and they propose that this adaptation was developed because our original cheater-detection adaptations led to increasingly subtle forms of cheating. The ability to detect altruism would have become more and more important as approaches to cheating became more and more subtle and strategic.

Cosmides and colleagues developed the idea that reasoning about social exchange is controlled by social contract algorithms, which compute the information necessary to engage in and maintain mutually beneficial social relationships. The research approach advocated by this group involves defining what abilities a person must have to enable social contracting. Following the cognitive neuroscience agenda, Cosmides attempts to identify and explain how evolved modules in the brain are sorted into functionally specific units, including those needed for solving problems of social exchange. For social exchange, potential contracting partners must have the ability to recognize costs and benefits of the exchange. When presented with a decision rule, the algorithms assess these harms and gains. In essence, they compute whether the contract is beneficial, overall, to the person.

There are fitness advantages of reciprocity in social exchange relationships, and so algorithms designed to enable individuals to reason about social exchange would then favor cooperative relationships. Social contract algorithms would also need a sub-routine mechanism designed to detect defectors from agreed-upon reciprocal arrangements, so that individuals who cheat on a contract are not trusted in future social exchange relationships. Thus, "human social contract algorithms must include procedures that allow us to quickly and effectively infer whether someone has cheated, or intends to cheat on a social contract" (Cosmides & Tooby, 1989: 84). (Cheating in this context is simply a violation of the conditional rule of the social contract, either implied or explicit. It involves not paying a cost when the exchanged benefit was taken. From the first-person perspective, an individual has been cheated when she pays the cost but does not receive the agreed upon benefit.) It was important for our Pleistocene ancestors to efficiently and quickly detect cheaters on social exchanges so as to exclude or punish that person in future exchanges. Punitive behaviors toward a cheating party involve not contracting with that party in other encounters or punishing those cheating agents even at one's own expense (Price, Tooby, & Cosmides, 2002). (The evolutionary origins of such punitive tendencies is described at the beginning of part 3 in this article.)

Dominance Hierarchies in Social Exchanges: The Development of Group Norms

Another factor in our ancestors' survival involved the structure of social groups in which they lived. Evolutionary psychologist Denise Cummins (1999) refined Cosmides's approach to address this issue. Cummins recognized that our forefathers operated in a social world that was organized on power differentials. Common to

social life among early humans is the formation of dominance hierarchies (Stone, 1997). Dominance evolved because, often, dominant individuals had more success obtaining resources such as food and sexual mates. Early humans also had to navigate around a socially differentiated world. Based on this premise, Cummins argues that "special reasoning architecture evolved (among apes and humans) to handle problems that are repeatedly encountered by individuals living in dominance hierarchies, problems that directly impact survival rates and reproductive success" (Cummins, 1999: 30).

Permissions and obligations often arise out of rules created by people in positions of power. Those higher in the hierarchy create conditional rules of acceptable behavior for subordinates. Cummins argues that group norms develop from these social dominance practices. Groups that survived over the years and were able to reproduce acknowledged that their long run interests were realized if they protected themselves from selfish behavior on the part of a few individuals (Ridley, 1985). The norms of the group (i.e., its culture) include the permission rules described in the social contracts. To maintain reciprocally altruistic behavior, naturally motivated social order rules developed so as to regulate behavior, such that cheating behavior would be scorned and punished. The group norms and reciprocity checks thus protected the group from deviant behavior which would adversely affect the group's ability to propagate

Cooperative Coalitions

Another type of evolved social exchange involves alliance formation with more than one individual to collectively achieve a particular goal. In evolutionary psychology, research on groups has discovered that coalitions commonly formed out of groups in order to fulfill a common need. In turn, exchange obligations among individual group members may result from coalition formation (Tooby, Cosmides, & Price, 2006). The advantages that our participating ancestors gained by banding together ensured their differential reproductive success over non-participating ancestors, making way for the evolution of psychological mechanisms designed to promote cooperative coalitions.

Because coalitions involve more than two participants, and individual levels of involvement and contribution are less easily measured, incidents of defection and free-riding by individuals are more readily attempted, resulting in higher costs for the other participating individuals and jeopardizing the success of the coalition. The problems of free-riding and defection are so costly that many scientists and economists believe that cooperative coalitions will ultimately collapse as a result. Defection is considered an "evolutionarily stable strategy" in many circles, and once an evolutionarily stable strategy infiltrates a population, it cannot be overtaken by another strategy (Maynard Smith & Price, 1973). However, evolutionary psychologists (Boyd &Richardson, 1992; Gintis, 2000; Heinrich & Boyd, 2001) have identified punishment as the key variable in solving the defector and free-rider problems and enabling the evolution of cooperative coalitions. And although a consensus has not been reached about how these problems can be solved, there is increasing evidence

that humans do have punishment-related adaptations that are put into action in the context of cooperative coalition free-riders (Price, Tooby, & Cosmides, 2002). In fact, Fehr, Fischbacher, and Gächter (2002) and Kurzban, McCabe, Smith, and Wilson (2001) found that high levels of cooperation tend to emerge when punishment for free-riding is enforced. According to Price and colleagues (2002), punitive sentiment not only serves to motivate a free-rider to contribute, but also reduces the free-rider's fitness relative to those who readily participate in the coalition, giving a slight advantage to these individuals in terms of differential reproductive success. The researchers identified the single best predictor of punitive sentiment as being the degree of the person's own participation in the cooperative coalition, such that the higher the degree of participation by an individual, the more that person wanted to punish the free-rider.

Costly Punitive Sentiment and Altruistic Punishment

Despite the evidence that punitive sentiment is an evolved psychological mechanism, the question remains as to how this type of behavior possibly could have evolved, given the costs borne by individual punishers: while the benefits of punishment for the group are clear, the individual punisher must expend time, effort, and other resources, and bears an increased risk of retaliation by the punished. Henrich and his colleagues (2006) thus deem punitive actions by individuals to be acts of altruism.

Competing theories of the adaptiveness of altruistic punishment have been proposed. One explanation highlights the possibility that the punishers gain a personal advantage by administering punishment; such as developing a reputation as a punisher and as someone who is trustworthy and group-focused. Cheaters are likely to avoid someone who has a punisher reputation for fear of being punished themselves, and others are likely to seek these "punishers" out for cooperative relationships because of their high degree of trustworthiness. Other explanations of the adaptive function of costly punishment are discussed in the following section, which concerns the concept of strong reciprocity.

PART 3. COSTLY SANCTIONING OF UNETHICAL BEHAVIOR

Strong Reciprocity

A critical ethical issue concerning all relations among organizations, and among individuals within organizations, is the ubiquitous nature of strong incentives to violate norms concerning cooperation. As noted by Fehr et al. (2002), "In any kind of social or economic exchange situation between two or more individuals in which not all aspects of the exchange are determined by enforceable contracts, there are material incentives to cheat the exchange partners." Thus, for example, absent the possibility of punishment for non-compliance, employees have good reason to shirk, suppliers have good reason to provide substandard goods, and team members have good reason to free-ride. Despite the omnipresence of opportunities to cheat on non-binding agreements, however, the obligations associated with such agree-

ments are routinely kept. In addition to reciprocal altruism, another source of such behavior is strong reciprocity.

Strong reciprocity is a tendency to cooperate with others, and to sanction non-cooperators, violators of reciprocity norms, and those who act unfairly (Fehr et al., 2002; Gintis, Bowles, Boyd, & Fehr, 2003). It combines the concepts of altruistic rewarding—the tendency to reward those who cooperate and adhere to norms—and altruistic punishment—the tendency to punish those who violate norms (Fehr & Fischbacher, 2003). According to Fehr and colleagues:

> A person is a strong reciprocator if she is willing (ii) to sacrifice resources to be kind to those who are being kind and (ii) to sacrifice resources to punish those who are being unkind. (Fehr et al., 2002: 3)

Strong reciprocity contrasts with reciprocal altruism. In reciprocal altruism, an individual also rewards cooperation and punishes non-cooperation; however, reciprocal altruists incur the short-term costs of punishment and reward *with the expectation of long-term benefits resulting from their altruism* (Fehr et al., 2002). On the other hand, in the case of strong reciprocity, rewards and punishments occur even when it is unlikely or impossible that these costs will ever be recovered; thus, strong reciprocators take on the costs of rewarding or punishing despite receiving no net economic benefit—present, short-term, or long-term—from the action (Bowles, Fehr, & Gintis, 2003; Fehr & Henrich, forthcoming). Fehr et al. (2002) illustrate the distinction between reciprocal altruism and strong reciprocity using a *one-shot* Prisoners' Dilemma (PD) situation: because the possibility of future interaction—and the possibility of benefitting from future interaction—is non-existent, a reciprocal altruist will always defect in a one-shot PD. A strong reciprocator, on the other hand, is not concerned about the lack of future returns from cooperation in a one-shot game, and so will "reward" cooperation by cooperating (and "punish" defection by defecting) even when future interaction is impossible.

Strong reciprocity can be seen as "other-regarding behavior." Strong reciprocators make contributions, absent reward to themselves, in order to either reward adherence to norms or punish non-adherence: they make material sacrifices to reward fair behavior or behavior in accordance with norms, and to punish unfair behavior or behavior that violates norms (Fehr et al., 2002). Emotions are usually seen as the proximate cause of strongly reciprocal behaviors (Fehr & Fischbacher, 2004; Fehr & Gächter, 2002; Fehr & Henrich, forthcoming). Violation of norms leads to negative affect, and strongly reciprocal behavior in the form of altruistic punishment is often the result, while adherence to norms, or exceeding their requirements, leads to positive affect and altruistic rewarding. Fehr & Gächter (2002), for example, found that subjects who punished free-riders in a one-shot public goods game indicated that they felt anger toward those free-riders, with the degree of anger positively related to the difference between the free-riders' contributions to the public good and those of the rest of the group. Anger on the part of other group members was likewise *expected* by the free-riders, with the result that free-riding was considerably more likely in an experimental condition that did not permit punishment.

Strong reciprocity—and the expectation of strong reciprocity in others—can be seen in various aspects of everyday life. For example, a North American traveling to a different (North American) city and dining alone is likely to tip a restaurant server, even though the likelihood of a future interaction with that server may be infinitesimal, and there is no gain in general reputation possible. Furthermore, that server is likely to *expect* a tip, even though he knows he will never interact with the traveler again, and the traveler would be better off financially leaving him nothing. The impulse for strong reciprocity can be seen as a natural part of human behavior (Fehr & Gächter, 1998): many or most of us are predisposed to be kind to those who do us a kindness and unkind to those that are unkind to us, and evidence of strong reciprocity has been found in a wide variety of nations and in populations with widely varying demographic characteristics (Fehr & Fischbacher, 2003). However, research does suggest that people vary in the degrees to which they exhibit strong reciprocity (Fehr et al., 2002).

Group Selection, Gene-Culture Co-Evolution, and Development of Strong Reciprocity

Strong reciprocity among humans is seen by many researchers to result from evolutionary processes: evolutionary conditions faced by humans resulted in "a propensity for strongly reciprocal behavior among a significant fraction of the population" (Fehr et al., 2002: 3). In this view, strong reciprocity is a product of group selection processes and gene-culture co-evolution (Bowles et al., 2003; Gintis et al., 2003; Smith, 1976). Cultural and institutional features of human existence within groups—which, as discussed briefly below, are themselves derived from selection processes—allow for the selection of strongly reciprocal behavior. They do so by counteracting selection pressures stemming from the fact that altruistic behaviors *reduce* the fitness of individuals who engage in them, inasmuch as they are costly to those individuals. Thus, due to cultural and institutional forces, "there are compensating fitness advantages that offset the net costs of behaving as a strong reciprocator" (Bowles et al., 2003: 46). This, coupled with the fact that groups in which members engage in strongly reciprocal behavior may outperform those that do not, results in the persistence of strongly reciprocal behavior in humans.

Selection effects can occur at the group as well as the individual level in situations where there is a high rate of interaction among members within groups relative to the frequency of interactions between groups. In these cases, groups with fitness advantages relative to other groups will persist, while disadvantaged groups may disappear. Bowles et al. (2003) argue that altruistic behavior *within* groups, while representing a disadvantage to the individual, confers fitness advantages on other members of the group; thus, strongly reciprocal behavior in humans may have evolved because it benefits the groups whose members engage in such behaviors relative to groups whose members behave in a self-interested manner.

Evolutionary models typically predict that between-group selection processes cannot override individual within-group selection pressures (Fehr & Fischbacher, 2003). These models predict that migration between groups (e.g., self-interested

individuals from one group infiltrating a group with a preponderance of altruists), compounded with within-group selection pressures working against strongly reciprocal individuals (strong reciprocators bear significant costs, which puts them at a disadvantage in terms of their fitness), will prevent long-term genetic distinctions between groups. This, in turn, precludes group selection processes (Aoki, 1982): any self-interested individuals that join a group characterized by many altruists would have an advantage allowing them to reproduce at a higher rate, negating between-group differences in the proportion of altruists (Fehr & Fischbacher, 2004) and making group selection impossible. Thus, Fehr and Fischbacher (2005: 37) assert that "purely genetic group selection is . . . unlikely to provide a satisfactory explanation of strong reciprocity."

However, some make the argument that humans are fundamentally different from other organisms, with the result that group selection processes have a much greater impact on human evolution than they do on the evolution of other species (Sober & Wilson, 1994). Critically, humans have developed facility with language and possess other substantial skills which result in the ability to: (1) create and maintain boundaries between groups, and (2) create rules and regulations governing behavior within groups. The consequence of such practices is that cultural inheritance has a large impact on human behavior (Bowles et al., 2003). This, in turn, allows for a process of gene-culture co-evolution: cultural forces shape the environment in ways which "affect the process of selection of both culturally and genetically transmitted traits." Cultural traits are transmitted through forces of social learning (Bandura, 1977), particularly through imitation and teaching (Fehr & Fischbacher, 2003, 2005), and sustainable boundaries between groups result in powerful differences in cultures, which allow group selection to occur. Hence, cultural institutions are "capable of imparting distinctive direction and pace to the process of biological evolution" (Gintis et al., 2003: 165).

In the case of strong reciprocity, culturally transmitted forces within a group can be seen as reducing the fitness disadvantage associated with altruistic rewarding and punishment, and denying any fitness advantage to self-interested individuals (Fehr & Fischbacher, 2003, 2004). The costs associated with strongly reciprocal behavior (e.g., reduced material success) are countered by the existence of cultural norms and institutions supportive of such behavior, which allows such behaviors to persist in humans even in the face of within-group selection pressures working against strongly reciprocal individuals (Bowles et al., 2003) and the migration of selfish individuals from other groups (Fehr & Fischbacher, 2004). In short, strong reciprocity can be "rewarded" as a result of cultural traits, or the lack thereof can be punished (Fehr & Fischbacher, 2003, 2004; Trivers, 1971). For example, one possible cultural force supporting strongly reciprocal behavior is the threat of ostracism (Gintis, 2000; Gintis et al., 2003), resulting from "moralistic aggression" designed to "educate (the) unreciprocating individual by frightening him" or to directly select against the unreciprocating group member (Trivers, 1971: 49): those who do not reciprocate can be excluded from aspects of group membership, or from the group itself. It can be readily seen that sanctions by "third-parties" not necessarily directly affected by the violation of strong reciprocity norms is critical, as ostracism would be

impossible without it. The existence of such sanctioning behavior has been identified experimentally (Fehr & Gächter, 2002; Fehr & Fischbacher, 2004).

Other institutional elements may be employed to limit within-group competition, which further increases the impact of between-group competition (Gintis et al., 2003). Group selection may then favor groups characterized by (or at least including) individuals who engage in behaviors associated with strong reciprocity, as strongly reciprocal behavior by individuals may contribute to the success of the group as a whole. For example, people cooperating and helping one another in times of crisis (as a result of a propensity for strong reciprocity) will reduce the likelihood of extinction of the group, as will strongly reciprocal behavior in times of inter-group conflict. This should allow groups characterized by strong reciprocity to flourish at the expense of groups that are comprised predominantly of selfish individuals (Fehr & Fischbacher, 2003, 2005; Gintis, 2000; Gintis et al., 2003). Strongly reciprocal behavior might also have a positive influence on group size, which also reduces the chance of group extinction (Bowles et al., 2003).

In sum, according to the typical account of the evolution of strong reciprocity, although within-group selection effects may result in evolutionary pressures *against* strong reciprocity, the presence of cultural institutions favoring strongly reciprocal behaviors counters these pressures, and other institutions may limit within-group competition, increasing the importance of between-group differences. Between-group selection effects including inter-group conflicts then favor groups characterized by strong reciprocity over those typified by self-interested individuals, with the result that groups with comparatively more strong reciprocators will be more likely to endure.

There is another possible account of the evolution of strong reciprocity. Bowles et al. (2003) note that it is possible that altruistic behavior such as strong reciprocity may not, in fact, represent a fitness disadvantage for individuals within groups, and in fact may represent an advantage. It may be that strong reciprocators are compensated for their behaviors in some way *not* defined by cultural institutions. Strongly reciprocal behavior, for example, might signal that the individual is a good potential mate, resulting in advantages in sexual selection processes. Furthermore, in groups with a sufficient number of strong reciprocators who are willing to punish those who do not engage in strong reciprocity, strong reciprocators may again possess a fitness advantage over self-interested individuals (Fehr& Fischbacher, 2003). If this is the case, "weak" group selection processes could lead to the proliferation of strongly reciprocal behavior in humans even without the existence of cultural institutions offsetting the costs to the individual associated with strongly reciprocal behavior.

PART 4. EVOLUTIONARY PSYCHOLOGY AND BUSINESS ETHICS: TOOLS AND APPLICATIONS

In this section, we describe various instruments and experiments that have been widely used to empirically test hypotheses about social exchange phenomena such as cooperation, altruism, and reciprocity that are derived from evolutionary psychology, and we argue that these approaches also could be used to generate and

test hypotheses relevant to business ethics. Put differently, these instruments and experiments serve to demonstrate how actual behavior in fact accords with what we should expect to find if, as proposed, the framework of evolutionary psychology (outlined above) is correct; they help to reveal, in effect, the evolutionary value of the behaviors in question, especially when that value might not be patently obvious. (It is worth noting that, although the use of these instruments is common in the testing of hypotheses derived from evolutionary psychology [and evolutionary economics], the origin of the instruments themselves has not always been in evolutionary theory [e.g., game theorists will recognize some familiar experiments]. In addition, we limit our attention to behaviors relevant to phenomena such as cooperation, altruism and reciprocity, noting that there are many other aspects of human thought and behavior that we are not addressing. Practices such as cooperation, altruism, and reciprocity, however, have clear relevance to matters of ethics.)

The Public Goods Game

Public goods games (Gintis et al., 2003) involve groups of participants in sequential rounds of play. Each subject is grouped with other participants, usually under conditions of anonymity, although this criterion can be varied depending on the question of interest. Each subject in a group (of, for example, four participants) is given a number of "points" (say, 20) which can be redeemed at the end of the study for real money. In each round, subjects choose proportions of their points to put in each of a "common account" (i.e., ultimately shared among all players) and a "private account" (i.e., reserved to the participant in question). After contribution decisions are made, the researcher tells the subjects how many points were contributed to the common account, and makes an addition to the private account of each participant based on that point count (say, for example, 40 percent of the total point count in the common account). In this example, then, if a subject contributes all 20 of her points to the common account, each group member (including herself) will receive 8 points at the end of the round. The player who contributes her entire endowment of 20 points "loses" 12 points, but the other members of the group gain a *total* of 24 points: however, in this example, if every player contributed all 20 of their points, each would end up with 32 points at the end of the round. Each player keeps the points that remain in her account at the end of each round.

The public goods game has been widely used to examine cooperation, reciprocal altruism, and strong reciprocity. Gintis et al. (2003) note that a self-interested player will *never* contribute anything to the common account in the typical public goods game. However, in practice, only a fraction of experimental subjects refuse to contribute: researchers have uniformly found that groups evince a much higher cooperation rate than would occur if subjects were self-interested, with typical contribution rates of between 40 and 60 percent of players' initial endowments. Such cooperation, though, tends to deteriorate in succeeding rounds of the game. This diminishing rate of contribution over subsequent rounds, while not consistent with a self-interest model of human behavior, *is* consistent with predictions based on the concept of reciprocal altruism: since the opportunities for reciprocal behavior

diminish as the game moves toward its end, contributions to the common account likewise diminish (Gintis et al., 2003).

In variations of the public goods game where participants are allowed to pay a "fee" to punish non-contributors to the common account, however, deterioration of cooperation is vastly diminished and, in fact, cooperation may increase over subsequent rounds. Fehr & Gächter (2002) employed such a game to identify the occurrence of strongly reciprocal behavior in the form of altruistic punishment. While a self-interested player will not engage in a costly punishment, a strongly reciprocal player will have a propensity to punish free riders or low contributors, even in the absence of the possibilities of future interactions or reputation enhancement through the use of punishment. For example, Fehr and Gächter (2002) found that in a ten-session public goods game where the possibility of paying to punish other players was present, 84.3 percent of subjects punished others at least once, with 74.2 percent of punishments being imposed upon below-average contributors to the common account.

An Application of the Public Goods Game: Strong Reciprocity and Ethical Culture

We suggest that public goods games can also be employed to advance research in business ethics. One specific example would employ such games to investigate the role that strongly reciprocal behavior might play in the development (or lack thereof) of an ethical organizational culture. As noted, cooperation in public goods games tends to deteriorate over subsequent rounds of play. Fehr and Gächter (2002) submit that the process of deterioration of contribution to a public good is basically as follows: strong reciprocators contribute to public goods based on their expectations that others will do the same; however, most public good situations also involve free-ridership by some (selfish) individuals who also benefit from the good. In early "rounds" of contribution to a public good, subjects evince optimism concerning others' likely contributions, but these expectations are disappointed by the non-contributions of free-riders, which leads to an eventual breakdown in contribution behaviors by all. Fehr and Gächter (2002) argue that a small number of selfish individuals who free-ride can rapidly lead to an equilibrium of zero contributions from all beneficiaries of a public good: in short, even strong reciprocators (i.e., non-selfish individuals) will cease contributions when they begin to believe that others will refuse to contribute—in effect, the only means for a strong reciprocator to punish a free-rider is often to cease contributions herself. Research by Gintis et al. (2003), however, indicates that a minority of strong reciprocators can lead to cooperation becoming dominant in a public goods setting *if* there is a mechanism in place which allows them to engage in altruistic punishment of non-contributors: as noted earlier, targeted punishment of selfish non-contributors increases their propensities to contribute, which decreases the likelihood that strong reciprocators will also refuse to contribute.

If one sees an ethical organizational culture as a public good resulting from adherence to ethical norms, where adherence represents a contribution to that public

good, derivations of the public goods game could be used to assess the possible influences of strongly reciprocal (or other) behaviors on the development of such a culture. For example, we suspect that if strongly reciprocal individuals are able to impose targeted punishment on those who violate ethical norms within the organization, these "non-contributors" will be less likely to engage in norm-violating behaviors, strong reciprocators will be likely to continue to "contribute" to the public good by abiding by ethical norms, and an ethical culture will be more likely to develop. Such targeted punishment might involve ostracism, lack of cooperation in subsequent bi-lateral encounters between contributors and non-contributors, or a myriad of other actions. On the other hand, in the absence of such punishment mechanisms, "non-contribution" (i.e., lack of adherence to ethical norms) by a minority of selfish individuals could trigger non-contribution by strongly reciprocal individuals as well, leading to a downward spiral in terms of abidance by ethical norms, and a resultant compromise in the ethical culture of the organization. Thus, we suspect that an ethical organizational culture is more likely to be present where the organization is characterized by at least some strongly reciprocal individuals *and* means for those individuals to use targeted punishment to penalize those who do not abide by the ethical norms of the organization. Variations of the public goods game could be employed to test this and related hypotheses.

The Wason Selection Task

The most widely studied reasoning problem in psychology (Santamaria, Garcia-Madruga, & Carretero, 1996) is also the source of the most commonly used instrument in evolutionary psychology research: the Wason Selection Task (Wason 1966, 1968). The Wason Selection Task (WST) was initially developed to investigate individuals' abilities in logical reasoning. In particular, the task focuses on reasoning about the application of conditional rules. The prototypical application of the WST is an abstract version involving the presentation to each subject of two numbers and two letters on four separate cards. The subject's goal is to identify which cards need to be turned over in order to ascertain the veracity of a conditional rule. Figure 1 illustrates an abstract version of the WST.

Applications of such abstract versions of the WST typically result in a low proportion of subjects turning over the logically correct cards: for example, in the task

You are given the statement: "If there is an 'E' on one side of a card, then there is a '4' on the other side."
The cards below have a single number on one side and a single letter on the other.
Which of the cards would you need to turn over to test whether the statement is true or false?

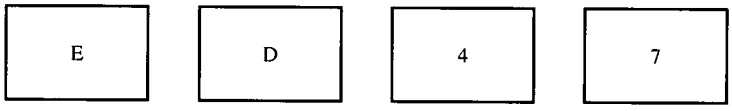

Figure 1: Standard Abstract Logic Structure Wason Selection Task
Source: Manktelow, 1999

presented in Figure 1, the correct cards to turn over are the "E" and the "7." One must flip the "E" to make sure that there is a "4" on the other side, as any other number would violate the conditional rule, but one must also flip the "7," to make sure that there is not at "E" on the other side, as an "E" on the reverse of the "7" would also

falsify the rule. The veracity of the rule cannot be ascertained by turning over either of the other two cards: it makes no difference what is on the reverse of the "D," since the rule implies nothing about cards with a "D" on them, and choosing the "4" does not confirm or disconfirm the rule, since, for example, a "Z" on the reverse of the "4" does not relate to the rule. Generally, in abstract versions of the WST, fewer than 10 percent of subjects choose to turn over the correct cards.

Cosmides (1985; 1989) adapted the original WST to reflect social contract conditional rules in order to test for the presence of naturally formed cheater-detection algorithms in the brain. Hence, the abstract conditional rule was changed to a cost-benefit structure representative of a social contract. Cosmides described a situation in which one party is obligated to "pay" a cost in order to receive a benefit. Cards were therefore altered to indicate whether or not a cost is paid, and whether or not a benefit has been received. The basic form of the conditional rule in such studies is "If you pay the cost then you can take the benefit"; for example, Gigerenzer and Hug (1992) employed a social contract WST where the conditional rule was, "If someone stays overnight in the cabin, then that person must bring along a bundle of wood from the valley." A generalized version of the social contract WST is presented in Figure 2. Individuals choose the correct cards in social contract versions of the WST at up to ten times the rate of correct choice on the abstract version of the task. Cosmides, and later, Cosmides and Tooby, posited that since people perform so much better on the social contract task than on the abstract version, it can be inferred that people have cognitive adaptations "specialized for detecting cheaters in situations of social exchange" (Cosmides & Tooby, 2000: 1264). That is, humans have become, through evolutionary processes, hard-wired to be able to recognize violations of social contracts.

The "social contract" type of WST can be varied in terms of content of the contract and the context, which presents the opportunity for the application of the task to research related to business ethics. For example, Wasieleski and Hayibor (2008) employed an adaptation of the WST that presented the conditional rule "If a person is drinking a beer, then the person must be over 21 years of age" in order to study the effects of moral intensity perceptions on the ability to detect rule violations, as described below, and Wasieleski and Weber (forthcoming) employed a similarly structured but contextually different WST to investigate the impact of one's role in the organization on detection of cheating behavior.

It is your job to enforce the following law: "If you take the benefit, then you pay the cost."
The cards below have information about four people. Each card represents one person. One side of a card tells whether a person accepted the benefit and the other side of the card tells whether that person paid the cost.
Indicate only the card or cards you definitely need to turn over to see if any of these people are breaking this law.

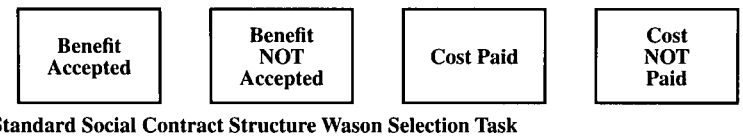

Figure 2: Standard Social Contract Structure Wason Selection Task
Source: Cosmides, 1985

An Application of the Wason Selection Task: Hierarchy and Detection of Rule Violations

Hierarchical relationships should be familiar to human minds, since social groups were organized along lines of power in our hunter-gatherer past. Corporations are organized hierarchically, and also in terms of agency-type relationships, where one person acts on another's behalf. Cosmides and Tooby (2004) suggest that even though hierarchical relationships are familiar to our minds, such agency relationships may suppress the triggering of cheater-detection algorithms, because it often is not clear who is being cheated. Agents "who do not see the company's costs and benefits as such are unlikely to spontaneously attend to potential cases of cheating by employees or clients" (Cosmides & Tooby, 2004: 108). Likewise, Cosmides's evolved algorithms for reciprocity do not take into account the true context of an agency relationship—one based on a difference in power and social status. Thus, the social structure of the corporation may be a possible factor affecting the cheater detection, and detection of rule violation may vary based on one's position in that structure. The potential exists, then, to apply the WST to assess whether or not detection of cheaters—or, more broadly, recognition of ethical issues (Wasieleski & Hayibor, 2008)—varies with position in the organizational hierarchy. Adaptations of the WST allow for the "cuing" of different hierarchical positions: such cuing could be used to assess differences in cheater detection across hierarchical levels.

In another display of the role of power on the ability to detect cheaters, Gigerenzer and Hug (1992) utilized the WST to demonstrate that the perspective taken when responding to the instrument makes a profound difference in the ability to detect violators of rules. Their study suggests that when a respondent (i.e., a subject analyzing the task) is presented with a scenario that cues her into the role of the person enforcing the social contract (i.e., the person in a position of power), and the other contracting partner has the option of cheating, detection rates rise significantly. In other words, the person who has resource power, in that she possesses the information that the other party indeed may be cheating, does have an enhanced ability to recognize when partners are violating the social contract conditional rule.

An Application of the Wason Selection Task: Moral Intensity and Recognition of Ethical Issues

Another area for application of the concepts of evolutionary psychology and the WST to business ethics is in the study of moral intensity (Jones, 1991). Jones proposed that the intensity of a moral issue affect individuals' abilities to recognize it, form judgments in relation to it, and both intend to and actually act on those judgments (i.e., each stage in Rest's four-step model of ethical decision making and behavior [Rest, 1986]). He characterized moral intensity in terms of six features of a possible act: (1) magnitude of consequences (the net sum of harms and benefits ensuing from the act); (2) social consensus (the degree of agreement among relevant referents that that act is either good or bad); (3) proximity (the "closeness" an actor feels to those affected by her actions); (4) probability of effect (the likelihood that an act will occur, and do so with the anticipated outcomes); (5) concentration of effect

(for a given level of consequences, the degree of dispersion of those consequences); and (6) temporal immediacy (the time lag from the present to the occurrence of an act's morally relevant consequences).

Wasieleski and Hayibor (2008) used concepts from the field of evolutionary psychology, and the WST, to investigate the extent to which the moral intensity of an issue influences issue recognition, the first step in Rest's model of ethical decision-making and behavior (used also by Jones 1991). Using a scenario-based design, they employed the WST to assess the extent to which variations in the perceived moral intensity of issues influenced individuals' abilities to recognize those issues as *ethical* issues (by detecting rule violations representing violations of a social contract). They hypothesized that issue recognition would be positively related to moral intensity, as assessed with reference to three of the more robust moral intensity components: magnitude of consequences, social consensus, and proximity. Although Wasieleski and Hayibor represented a novel use of the WST in business ethics research, their results provided little support for the hypothesis that moral intensity influences the ability of subjects to detect rule violations.

The Ultimatum Game

The ultimatum game is a two-stage game, usually involving two participants, though variations on the number of participants have occasionally been used to test specific hypotheses (Güth, Schmittberger, & Schwarze, 1982; Fehr & Fischbacher, 2004). In the ultimatum game two players must divide a sum of money. The two players, who are unknown to one another during the game, are given the roles of "proposer," and "responder." In the first stage of the game, both players are shown an amount of money, m. Next, the proposer offers any portion of m to the responder. If the responder accepts the offer, the money is divided in accordance with the offer: for example, if the proposer offers 40 percent of the money and the responder accepts, the proposer receives $0.6m$, and the responder receives $0.4m$. If, on the other hand, the responder refuses the offer, neither player receives any money.

Experiments using ultimatum games have provided considerable evidence for the existence of strong reciprocity (Fehr & Fischbacher, 2003; Gintis et al., 2003). These experiments present one-shot games combined with a condition of anonymity between players; therefore, punishment or reward is costly to the player, and cannot be expected to be recouped in future interactions. A one-shot game under conditions of anonymity implies that a rationally self-interested responder should accept *any* offer made by the proposer. A self-interested proposer, knowing this, should offer the minimum amount possible (Fehr & Fischbacher, 2003). To reject an offer is to penalize oneself as well as the proposer, and, since there will be no future interactions between the proposer and the responder (or, if such interactions occurred, the players would not recognize one another), penalizing the proposer by rejecting his offer cannot serve the purpose of warning the proposer to be more generous in the future or building a reputation as a player who is not to be treated unfairly, two rationales that would make sense if multiple interactions between players who were known to one another were to occur. Rejection by the responder of an offer by the

proposer in the one-shot ultimatum game, then, can be seen as evidence of strong reciprocity—in this case, altruistic punishment (Fehr & Fischbacher, 2003).

Experimental evidence indicates that purely self-interested behavior, or approximations of it, almost *never* occurs in the ultimatum game (Fehr & Fischbacher, 2003; Gintis et al., 2003). In fact, the modal proposer typically offers something on the order of 50 percent of the money (though many proposers do offer less than half), responders often reject offers as high as 30 percent, and offers of less than 25 percent generally have a very high probability of being rejected (Fehr & Fischbacher, 2003). These results are inconsistent with rational self-interest, and are also inconsistent with concepts of reciprocal altruism, because, as noted, in a one-shot interaction with anonymity there is no way for the responder to recoup the losses that obtain from punishing the proposer. However, these results are completely consistent with the tenets of strong reciprocity: in short, some responders will pay to punish an "unfair" proposer, even when there is no way to recover that payment through future interactions or the reputational effects associated with being a "hard bargainer." Furthermore proposers seem to *expect* strongly reciprocal behavior from the responder; otherwise they would be unlikely to make high offers: they clearly understand that many responders will pay to punish unfair behavior on their part (Fehr & Gächter, 1998; Gintis et al., 2003). Experimental evidence of strong reciprocity has been found in a vast variety of cultural and economic situations, including groups in East Africa, Papua New Guinea, Indonesia, Central Asia, South America (Gintis et al., 2003), Russia, Switzerland, Hungary, Germany, Austria, and the Netherlands (Fehr et al., 2002), even when, relatively speaking, the monetary stakes are extremely high (Fehr & Fischbacher, 2003; Fehr & Tougareva, 1995).

Strongly reciprocal behavior from *third-parties* has also been identified using the ultimatum game. For example, in one variation, a third party is given the opportunity to spend monetary units in order to punish a proposer who she feels has made an unfair offer. Fehr and Fischbacher (2004) found that 55 percent of the third parties punished proposers who offered less than 50 percent of the money to be divided between the proposer and the responder. The authors argue, therefore, that norms of fairness take precedence over self-interest, even for parties that are not directly related to an exchange. Fehr et al. (2002) see the possibility of strongly reciprocal punishment by third-parties as critical to a group's—or a society's—ability to enforce social norms.

An Application of the Ultimatum Game: Strong Reciprocity in Stakeholder Action

The use of ultimatum games, tied to the concept of strong reciprocity, can inform research concerning relations between firms and their stakeholders, such as inquiries concerning stakeholder action. Much work in the field of stakeholder theory, and, some would argue, the stakeholder concept in general, hinges on the possibility that a stakeholder or stakeholders may take action in the form of sanctions against a focal organization. Such sanctions may take many forms, such as boycotts, sale of stock, strikes, and any number of other actions (Frooman, 1999), which can have severe performance implications for the organization. Nonetheless, with a few exceptions

(e.g., Rowley & Berman, 2000; Rowley & Moldoveanu, 2003; Hayibor, 2008), few researchers have investigated the conditions under which stakeholders are likely to take action against a focal organization. Hayibor (2008) articulated a framework, based on the concepts of equity (Adams, 1965) and expectancy (Vroom, 1964), concerning stakeholder propensities for action against a focal organization, and argued that a critical determinant of the likelihood of stakeholder action against the organization is whether or not it sees its relationship with the organization as equitable, and, if it does not, which type of inequity—"over-reward" or "under-reward"—is perceived. Since participants in the "responder" role in the ultimatum game generally expect the "proposer" to make an offer toward the midpoint of the possible offers (e.g., between about 40 percent and 60 percent of the available sum), this game provides an excellent opportunity to assess subject's responses to under-reward or over-reward.

Although the term "stakeholder" crosses levels—a stakeholder can be an individual, a group, or an organization—and thus often refers to collectives of people rather than the individual subjects in a typical ultimatum game, even in those situations where a stakeholder is not an individual, it is common for the actions of that stakeholder group or organization to be guided to a large extent by key influencers, authority figures, or decision makers (Frooman, 1999). Furthermore, Cordano, Frieze, and Ellis (2004), Key (1999), and others aver that there is substantial value in engaging in analysis of stakeholders and their interests at the individual level rather than focusing exclusively on stakeholder groups. Cordano et al. (2004: 27) state, "One important element in developing a more complete stakeholder theory is an improved understanding of what motivates individuals to act on an emergent issue." And even where the stakeholder is a group or organization that undertakes action as a collective, it is critical to understand how individuals become motivated to engage in these collective actions. Hence using ultimatum games to investigate the actions of stakeholders is not unreasonable, despite the fact that individual subjects are usually employed. Furthermore, simple adaptations of the ultimatum game (i.e., employing groups rather than individuals) would allow for studies of the responses of "collective stakeholders," rather than individuals, to distributive inequities.

One possible use of the application of the ultimatum game to study stakeholder action concerns the possible sanctioning of a focal organization due to the existence of strongly reciprocal stakeholders—that is, some stakeholders may be willing to "pay" to punish an organization for creating or perpetuating a perceived inequity (generally speaking, this would be under-reward inequity), even when this is not in the economic interests of the stakeholder. Ultimatum games could thus help shed light on the conditions under which stakeholders are likely to engage in strongly reciprocal behavior resulting in stakeholder action being directed against the focal organization. This potential for strongly reciprocal behaviors by stakeholders warrants particular attention due to its contrast with the "interest-based view" of stakeholder action, according to which stakeholder action directed at a focal organization generally is seen as resulting from the stakeholder's desire to protect or forward its own interests (Rowley & Moldoveanu, 2003). Strongly reciprocal behavior is not clearly in the interests of the actor, so if stakeholders engage in such behaviors, the interest-based

view of stakeholder action must be augmented, at least in terms of what sorts of stakeholder behaviors are seen to address their own interests (Hayibor, 2008). The existence of strongly reciprocal behaviors by stakeholders might also help explain the anomaly presented by Rowley and Moldoveanu (2003): stakeholders who pursue what appear to be lost causes. Perhaps it is the case that some stakeholders take action against focal organizations even if there is there is nothing to be gained by doing so, as a means of punishing them for perceived malfeasance.

In addition, Hayibor (2008) argues that various moderators may affect the relationship between under-reward inequity and stakeholder action. For example, variables such as the duration of the relationship between the stakeholder and a focal organization, the degree of resource dependence that characterizes the relationship, or stakeholder attribution of the inequity might moderate stakeholder responses to under-reward. The ultimatum game also provides the opportunity for these and other potential moderators of stakeholder responses to inequity to be studied: for example, it would be quite simple to alter the game or exercise discretion in the choice of subjects in order to create varying conditions concerning attribution of the inequity, or the degree of resource dependence or duration of the relationship between players.

A further topic that might be investigated is the extent to which stakeholders are willing to take action to further the interests of *other* stakeholders, or even non-stakeholders. This topic has not been widely addressed in the stakeholder literature, though it is clear that organizations which act (at least in part) on the behalf of others are relatively common. Propensities concerning such actions by "third-party" stakeholders might also be investigated using adaptations of the ultimatum game. For example, Fehr and Fischbacher (2004) employed a variation of the ultimatum game (known as the Dictator Game) to examine both the propensities of third parties to sanction one party for its poor treatment of another party, and the nature and strength of those sanctions. Variations on this approach could be used to inform stakeholder researchers about the tendencies for a stakeholder to act against a focal organization in response to the organization's treatment of a different stakeholder or a non-stakeholder.

The Moonlighting Game

The moonlighting game (Gintis et al., 2003) is a two-stage game involving two players. During the first stage, each player receives 12 points. Player A will then choose a number between -6 and +6. The choice of a positive number means Player A must transfer that number of points to Player B, and the points are *tripled* by the experimenter, whereas in the case that a negative number is chosen, Player A takes the absolute value of that number *away* from Player B (this number is not tripled). Subsequent to the point transfer instigated by Player A, Player B (after observing Player A's action) chooses a number between -6 and +18. If this number is positive, that number of point is transferred from Player B to Player A, while if it is negative Player B loses this number of points, and Player A loses *three times* this number of points. Hence, Player B has the option to pay to punish Player A if Player A's

initial transfer is deemed insufficient. Since this is a one-shot game, and there are no future interactions between players, a self-interested Player B will always choose 0, eschewing both reward and punishment of Player A, while a self-interested Player A will choose -6, which maximizes his or her payoff, given the likelihood that Player B will choose 0.

The moonlighting game, too, has been used to investigate the phenomenon of strong reciprocity, due to the one-shot nature of the game, and the possibility of punishment of Player A by Player B. In short, a Player B who pays to punish a Player A (by choosing a negative number in response to Player A's choice) can be seen as evincing strong reciprocity. Since players of the moonlighting game can also reward, it can also be used to investigate positive reciprocity. In one example of the use of the moonlighting game, Falk, Fehr, and Fischbacher (2002) used it to explore the role of intentions versus outcomes in eliciting reciprocal behavior, proposing that strongly reciprocal punishing behavior is more likely when the malefactor *intended* to violate relevant norms. Evidence indicated that most subjects were motivated by the intentions of the other player, but a significant number were focused on outcomes, either exclusively or in addition to intentions.

An Application of the Moonlighting Game: The Role of Intent in Responses to Unethical Behavior

A key concern in discussions of business ethics, and, indeed, ethics in general, is the distinction between the intentions underlying actions on the one hand, and the outcomes of those actions on the other hand. This distinction is of concern not just in determinations of the rightness and wrongness of actions, but also in assessing questions of how others will *respond* to those actions: good intentions, for example, may moderate responses to treatment that is perceived as wrong or unfair (Hayibor, 2008). The moonlighting game represents one possible mechanism for investigating the influence of intentions on responses to unethical behavior.

The effect of intention on the reaction to unfair or unethical treatment could be assessed by comparing the version of the moonlighting game described above to an adaptation wherein Player A's "choice" is based on the roll of a die, rather than on a decision made by Player A herself. If intention is irrelevant to Player B's response, she will respond in a similar manner in both conditions; however, if intention *is* a factor in Player B's behavior, she will be less likely to reward or punish Player A in the "no intention" condition, indicating that Player A's intentions have an effect on Player B's responses to unfair treatment.

Trust Games

In trust games (Fehr & List, 2004), two players participate in a game involving the exchange of monetary units. Both players are given an initial monetary endowment (e.g., 10 monetary units), and this endowment (including any changes based on play during the game) is kept by the player at the end of the game. In the first round, Player A, the "principal," initially transfers an amount of monetary units to Player B, "the agent," which is subjected to a "multiplier" (e.g., 3) by the experimenter,

such that Player B receives some multiple of the transfer. Player A also announces a "desired-back transfer"; that is, the level of transfer that she would like to receive from Player B in return. (The payoff to Player A in this example is equal to 10 - x + y, while the payoff to Player B is 10 + 3x - y, where x is the transfer from Player A to Player B, and y is the back-transfer from Player B to Player A.) Thus, Player A must trust Player B to transfer money back, and whether a back-transfer occurs can be interpreted as a measure of the "trustworthiness" of Player B. Given the payoff structure of this game, however, a completely selfish Player B should never transfer any money back to player A, and a completely selfish Player A, understanding this, should never transfer any money to Player B in the first place (in the form of a back transfer from Player B).

However, notwithstanding the predictions of the rational self-interest model of human behavior, positive reciprocity has been identified in many experiments using trust games (Fehr & Gächter, 2002). For example, Fehr and Tougareva (1995) found strong positive reciprocity, even when subjects could earn very large sums of money (e.g., equivalent to 10 weeks' salary) during the game.

In a variation on this basic trust game ("Trust With Punishment"), Player A is able to impose a fixed fine (e.g., 4), or punishment, that has to be paid by Player B if the actual back-transfer falls short of the desired back-transfer. In this variation, Player A's payoff is still equal to 10 - x + y, but Player B's payoff is 10 + 3x - y - 4, if the actual back-transfer was below the desired one and Player A had chosen the punishment option. A selfish Player A should always impose the fine, in the hopes of receiving a higher back-transfer as a result.

An Application of Trust Games: Adherence to Organizational Codes of Ethics

Fehr & List (2004) used the above versions of the trust game to assess the effects of the "incentive" (that is, the available punishment, and its use or non-use) on back-transfers by Player B, the agent. They suspected that deliberate non-use of an available punishment by the principal might be seen by the agent as a particularly trusting behavior, which might have an impact on back-transfers (i.e., the displayed trustworthiness) of the latter. Using subject pools that included seventy-six CEOs and 126 undergraduate students, they found that the presence of the punishment option increased back-transfers over the absence of such an option, but when the punishment option was available, back-transfers were higher if it was *not* used than if it was.

We suggest that the positive impact of the non-use of an available punishment could have interesting implications for research involving codes of ethics or organizational ethics norms. Fehr and List (2004) argued that their results indicate that the use of punishment reduces the trustworthiness of the punished subjects, which represents a "hidden cost" of the incentive system, while the deliberate non-use of an available punishment in response to a perceived violation of a distribution norm increases trustworthy behavior. Extrapolating from this idea, we suggest the possibility of investigating whether a similar relationship holds with respect to employees' adherence or non-adherence to, for example, organizational codes of

ethics. While intuition might suggest that non-punishment for norm or code violation will lead to the perception that the punishment threat is not to be taken seriously, which could in turn lead to subsequent malfeasance, based on the work of Fehr and List (2004) one might speculate that—assuming a punishment option exists—the deliberate non-punishment of an individual who is found to violate a prescription of an organization's code of ethics, or some other organizational norm, might in fact *increase* the likelihood of adherence to that norm in the future. It seems conceivable that the "act" of non-punishment might be seen by the malefactor as an indication that, notwithstanding the existing violation, he will be trusted in the future, and he might subsequently work to "earn" that trust by way of heightened adherence to organizational norms or the code of conduct. Equity theory (Adams, 1965) might also support such a proposition: non-punishment when punishment is available might be interpreted by the wrongdoer as an "outcome," or reward, for which the organization or its representatives must be compensated, and a particularly salient means of compensation would be future adherence to norms or codes of conduct. Investigating such questions could involve a variation on trust games, wherein Player A is given the option of either adhering to or violating a specific code of conduct (presumably with some personal incentive to at least consider violating it), and variations in the presence or absence, or degree, of punishment for code violations.

CONCLUDING THOUGHTS

Our review has ranged from the basic principles of evolutionary theory, to principles of evolutionary psychology, to an account of naturally formed dominance hierarchies and the social exchange relationships within them. In addition to reviewing the basics of evolutionary models of social exchange and ethically relevant phenomena such as cooperation and altruism, we also have presented evidence from experiments that not only show the applicability of these theoretical insights to actual behavior, but that also highlight the potential relevance of evolutionary approaches specifically to business ethics research. It is our hope that future research will build on these examples, take the already validated methodologies, and accept the insights from the evolutionary theories (both hardwired ones and culturally influenced ones) to inform the research being conducted on individual-level ethical behavior, group culture, stakeholder group action, and organizational structure (to name a few topics).

We believe that it is important for business ethics researchers to be well aware of the insights derived from evolutionary theory. Although business ethics research has made some progress towards understanding ethical and unethical behavior, and in applying that knowledge, we suggest that greater integration of evolutionary theory with mainstream business ethics research can further our understanding of ethically important phenomena in organizations. The incorporation of natural science insights is critical for a full comprehension of how people act, why they behave unethically in certain situations, and why they cooperate in other exchanges, and it also can help to reveal how cultural and organizational phenomena, in turn, affect biologically rooted behaviors and processes. In other words, social scientific and natural scientific approaches each are incomplete without the other.

Greater integration of social and natural scientific approaches to business ethics is not an unprecedented goal. In 2004, the Society for Business Ethics and the Darden School of Business at the University of Virginia published the fourth volume in the *Ruffin Lectures on Business Ethics*, focused on the topic "Business, Science, and Ethics" (Freeman & Werhane, 2004). Articles in that volume largely focused on the possibility of natural science approaches to ethics research, but did not go as far as to explore the application of specific natural science theories, such as evolutionary psychology, to particular business ethics topics. We hope that our review provides a clearer picture as to how business ethics researchers can adapt a natural science approach (i.e., evolutionary theory) to better analyze ethical behavior of individuals and groups, and also examine the formation of certain cultural institutions that might mitigate unethical actions. With sufficient effort, perhaps the fuller integration of natural and social science approaches ultimately can yield the kind of unified theory or framework that typically is lacking in organizational inquiries, and for which some researchers strongly advocate (e.g., Pfeffer, 1997; Zammuto & Connolly, 1984). Meanwhile, we believe that our examples and applications are strong and reasonable enough to justify a call that future research in the field of business ethics include more attention to evolutionary approaches.

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