

De Gustibus *Est* Disputandum*

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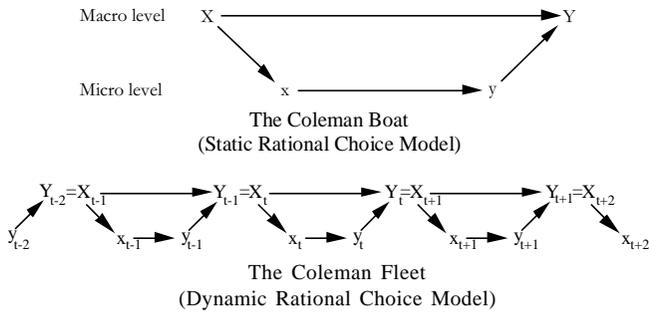
Abstract

While rational choice theorists have made great advances in their study of institutions and structures (and how they affect behavior), they have made less progress toward understanding the origins of values. I propose that the emerging field of evolutionary psychology complements rational choice theory by providing a theory of values, and that current explanations of values and preferences, such as learning, norms, and identities, are all compatible with evolutionary psychology, which provides more ultimate explanations for these proximate causes of behavior. The incorporation of evolutionary psychology into rational choice theory can also solve some of the persistent puzzles of rational choice theory: Why do so many players in Prisoner's Dilemma games make the irrational choice to cooperate? Why do people participate in collective action? Why do people sometimes behave "irrationally" by acting on their emotions? Why does rational choice theory appear to be more applicable to men than to women?

Sociological rational choice theory is a macro theory which explains aggregate social phenomena (Hechter & Kanazawa 1997). *Macro*, in this sense, does not necessarily mean "big"; anything larger than an individual, whether dyads, small groups, neighborhoods, nation-states, or the world system, qualifies as macro, and rational choice theory, in principle, can explain its behavior. Because rational choice theory is methodologically individualist, it explains these macro phenomena as an aggregate function of individual behavior at the micro level. (See Figure 1.)

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FIGURE 1: The Coleman Boat and Fleet of Rational Choice Theory



Y = Macrolevel explanandum
= f(Σy)

y = individual behavior
= f(X,x)
f ∈ subjective expected utility maximization, stochastic learning, imitation, etc.

X_t = structural and institutional constraints
= Y_{t-1}

x = individual values and preferences
= ...?

Individual behavior at the micro level is in turn a function of a combination of the macro structural and institutional constraints and the individual's values and preferences. Rational choice theory assumes that individuals do their best to pursue their values and preferences (whatever they may be), subject to the constraints imposed on them by the social structure and institutional rules and sanctions. These structural and institutional constraints are often the macro-level outcomes of the individual behavior in the past. It is therefore possible to link the static rational choice models (represented by the Coleman Boat [Coleman 1990:1-23]) and create a dynamic rational choice theory across time (represented by the Coleman Fleet).

Rational choice theory can therefore provide, in principle, a completely endogenous explanation of aggregate phenomena and individual behavior, *except for the individual values and preferences* (the lowercase x in Figure 1). Rational choice theory and neoclassical microeconomic theory (which provides some of its microfoundations) are usually mute on the origins of values and preferences (Hechter 1992, 1994). In fact, their traditional answer to the question of individual values and preferences is: De Gustibus Non Est Disputandum (Stigler & Becker 1977). There's no accounting for tastes, and one cannot explain individuals'

idiosyncratic values and preferences. (But see Becker 1996.) This inability of rational choice theory to provide an endogenous explanation of individual values and preferences makes it incomplete (Lindenberg 1992). A theory of revealed preferences, which is often used in microeconomics, only *measures* individuals' preferences empirically but does not *explain* where they come from or why the actors have them. While many have recognized this "problem of values" and have worked to resolve it (Becker 1996; Emerson 1987; Hechter 1992, 1994; Hechter, Nadel & Michod 1993), there has not yet been an explicit theory of individual values and preferences (except for Lindenberg's theory of social production functions discussed below).

While I concentrate on rational choice theory in this article, the problem of values, the necessity to explain individuals' values and preferences in order to explain their behavior, is not unique to rational choice theory. As England and Browne (1992; Browne & England 1997) demonstrate in their comprehensive review, almost all sociological theories assume, either implicitly or explicitly, that individual behavior is simultaneously a function both of internal states (values and preferences) and external constraints (social structure and institutions). Thus, all sociological theories, not just rational choice theory, need to have a theory of values and preferences in order to explain individual behavior and social outcomes.

In this article, I will argue that the emerging field of evolutionary psychology (Barkow, Cosmides & Tooby 1992) provides a theory of values and preferences and thus complements rational choice theory and other sociological theories. I contend that evolutionary psychology can explain numerous values and preferences that arise either from universal human nature (in the case of common values) or its interaction with the environment (in the case of idiosyncratic values), but it cannot explain all values and preferences. I will first introduce evolutionary psychology, by discussing its foundational principles, and then present one example of how evolutionary psychology and rational choice theory can combine to provide a complete theory of social outcomes. I will then discuss some current explanations of individual values and preferences, such as learning, norms, and identity, and argue that these explanations are all compatible with evolutionary psychology. It provides more ultimate explanations of learning, norms, and identity, which function as more proximate causes of behavior. Finally, I will discuss how the introduction of evolutionary psychology into rational choice can solve four persistent puzzles within rational choice theory: Why do so many individuals cooperate in one-shot Prisoner's Dilemma games when game theory predicts that all will defect? Why do people participate in social movements and political protests when rational choice theory predicts that they will freeride? Why do people sometimes behave "irrationally" by acting on their emotions rather than reason? Why does rational choice theory appear to be more applicable to men than to women?

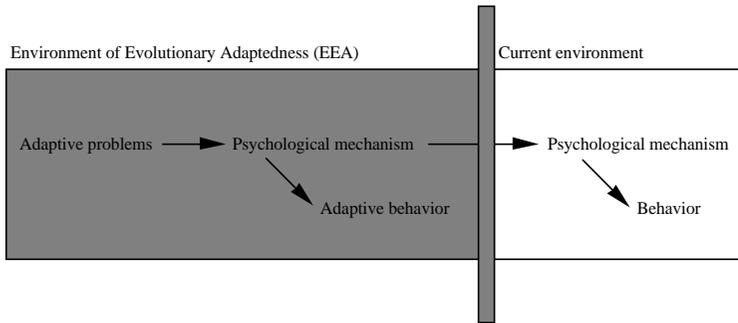
Principles of Evolutionary Psychology¹

Evolutionary psychology seeks to discover universal human nature, which is a collection of domain-specific evolved psychological mechanisms. An *evolved psychological mechanism* is an information-processing procedure or decision rule that natural selection has equipped humans to possess in order to solve a particular adaptive problem (a problem of survival or reproduction). Unlike decision rules in microeconomic subjective expected utility maximization theory or game theory, however, evolved psychological mechanisms mostly operate *behind and beneath our conscious thinking*.

Our preference for sweets and fats is an example of an evolved psychological mechanism (Barash 1982:144-47). Throughout most of human evolutionary history, procurement of sufficient calories to sustain our bodies physically was a particularly severe problem of adaptation (survival); malnutrition was a common problem. In this environment, those who had a “taste” for sweets and fats (which have higher calories) were better off physically than those who did not have the same taste. Those who had this taste therefore lived longer, led healthier lives and produced higher-quality offspring than those who didn’t. They in turn passed on their taste to their offspring, over many thousands of generations, until most of us living today have a strong preference for sweets and fats. (See Buss 1995:5-9 for other examples of evolved psychological mechanisms.)

Note that we do not consciously *choose* or *decide* to like sweets and fats. We just like them but otherwise don’t know why; sweet and fatty foods just taste good to us. Evolutionary psychology contends that these evolved psychological mechanisms are behind most of our preferences and desires, and they are also responsible for most of our emotions. Evolutionary psychology explains human behavior in terms of these evolved psychological mechanisms and the preferences, desires, and emotions that they produce in us. These evolved psychological mechanisms, in conjunction with the structural and institutional environments, can explain actors’ values and preferences (x in Figure 1) endogenously.

Evolutionary psychology is premised on two broad generalizations. The first generalization, to put it bluntly, is that there is nothing special about *Homo sapiens*. To put it more precisely, “certainly we are unique, but we are not unique in being unique. Every species is unique and *evolved* its uniqueness in adaptation to its environment. Culture is the uniquely human way of adapting, but culture, too, evolved biologically” (van den Berghe 1990:428). Human beings are just like other animal species (Maryanski & Turner 1992), and all the laws of nature — in particular, the laws of evolution by natural and sexual selection — apply as much to humans as they do to other species. The second broad generalization is that there is nothing special about the brain as a human body part; it is just like the hand or the pancreas or any other body part. Just as a long history of human evolution has

FIGURE 2: The Basic Theoretical Structure of Evolutionary Psychology

shaped the hand or the pancreas to perform a specific function, so has evolution shaped the human brain to perform certain tasks (solving adaptive problems).

The second generalization leads to a very important implication of evolutionary psychology. Just as the basic shape and functions of the hand and the pancreas have not changed since the end of the Pleistocene epoch about 10,000 years ago, the basic functioning of the brain has not changed very much in the last 10,000 years. The human body (including the brain) evolved over millions of years during the Pleistocene epoch in the African savanna where humans lived during most of this time (Maryanski & Turner 1992:69-90). This environment — African savanna where humans lived in small bands of fifty or so related individuals as hunter-gatherers² — is called the environment of evolutionary adaptedness (Bowlby 1969) or ancestral environment, and it is to the environment of evolutionary adaptedness (EEA) or the ancestral environment that our body (including the brain) is adapted.

Figure 2 presents the basic theoretical structure of evolutionary psychology. It argues that an adaptive problem leads to an evolved psychological mechanism, which then leads to adaptive (fitness-maximizing) behavior *in the EEA*. Evolutionary psychology assumes that all behavior *in the EEA* maximizes inclusive fitness of the actor (its ability to transmit its genes into the next generation both through its own descendants and through its genetic relatives). However, it recognizes that our current environment may be radically different from the EEA, yet our evolved psychological mechanisms (just like our hands and pancreas) are still the same as they were in the EEA and produce the same behavior as they did in the EEA. This leads to the distinct possibility that our behavior in our current environment might be completely maladaptive. “There is no *a priori* reason to suppose that any specific modern cultural practice is adaptive” (Tooby & Cosmides 1989:35). To the extent that our current environment is different from the EEA (to which all evolved psychological mechanisms are adapted), evolutionary psychology would predict that our current behavior is maladaptive.

Recall the example of our preference for sweets and fats as an evolved psychological mechanism. This psychological mechanism solved the adaptive problem of survival and reproduction in the EEA by allowing those who possessed it to live longer and reproduce more successfully. Our preferred consumption of sweets and fats was therefore fitness-maximizing *in the EEA*. However, we now live in an environment where sweets and fats are abundantly available in every checkout line in every supermarket in every city in every industrial society, 24 hours a day, 7 days a week. In other words, the original adaptive problem no longer exists; very few people die of malnutrition in industrial societies. Yet we still possess the same psychological mechanism to compel us to consume sweets and fats. Because our environment is so vastly different from the EEA, we now face a curious situation where those who behave according to the dictates of the evolved psychological mechanism are *worse off* in terms of survival and reproduction. Obesity (to which overconsumption of sweets and fats leads) hinders both survival and successful reproduction. Just as the intense use of our hands (which were designed for primitive activities in the EEA) for typing on a QWERTY keyboard leads to carpal tunnel syndrome, uncritically following the preferences and desires created in us by our evolved psychological mechanisms often leads to maladaptive behavior.

Evolutionary psychology strongly rejects the view of the human mind as *tabula rasa*, and avers instead that it is *content-rich* and *biased*. The human brain, and all its psychological mechanisms, are adapted to the EEA and are therefore biased in favor of viewing and responding to the world as if it were still the EEA. Note that the psychological mechanisms we possess today (in the white “current environment” in Figure 2) are still the same psychological mechanisms that we possessed in the EEA (in the shaded “environment of evolutionary adaptedness” in Figure 2). It is not impossible to overcome this bias through conscious effort, but it is often difficult. This is why we still respond to sweets and fats today as if we still lived in the EEA where such high-calorie foods were rare and malnutrition was an imminent problem for survival (even though many of us can consciously overcome the urge).

Phobias provide a good example. Most humans have deep-seated and innate phobias of spiders and snakes. This is because spiders and snakes, many species of which are poisonous, represented genuine threats to human survival in the EEA. That is why humans have biological mechanisms (either freezing or fleeing) to deal with these threats. Humans have been selected to have the psychological mechanism to fear spiders and snakes and the physical mechanisms to freeze or flee to avoid the danger.

This is true even today. Even though very few of us, living in urban cities, encounter poisonous spiders and snakes, we still have phobias about them. For most of us, cars and electric outlets represent far greater danger for survival than spiders and snakes; far more people in the U.S. die in car accidents and

electrocution than from spider or snake bites. However, most of us still have an innate and strong fear of spiders and snakes rather than of cars and electric outlets, because our brain is biased to perceive our environment as if it were the EEA, where there were no cars and electric outlets (Buss 1999:62-63). This fundamental observation, that *our brain and its psychological mechanisms are strongly biased to view and respond to the world as if it were still the EEA*, will have important implications in my discussion of several points below.

It is my contention that the evolved psychological mechanisms and their interaction with the environment produce values and preferences in us. No matter what individuals' values and preferences are, they are always in the brain. It is therefore important to figure out how the human brain works in order to solve the problem of values. It is the basic principle of evolutionary psychology that the brain consists of evolved psychological mechanisms. These psychological mechanisms create values and preferences that motivate human behavior. Human beings take these values and preferences as their goals and make rational decisions to pursue these goals within structural and institutional constraints. In the next section, I will present an illustration of how evolutionary psychology and its concept of evolved psychological mechanism complement rational choice theory to provide a complete theory of individual behavior and social outcomes.

An Illustration: The Emergence of the Institution of Marriage

Why are marriages in some societies monogamous while those in others are polygynous? What accounts for the gradual historical shift from polygyny to monogamy in the course of human civilization? What explains the particular form the institution of marriage takes in a given society or a given time in history? Despite the central importance of marriage and the family in sociology, there has been no sociological theory of the institution of marriage that addresses these questions. Kanazawa and Still (1999) provide a theory of the emergence of the institution of marriage that combines evolutionary psychology with rational choice theory to explain actors' (in this case, women's) values and preferences endogenously.

Among the psychological mechanisms that are most often studied and best documented by evolutionary psychologists are those about mate preference and selection. There is by now ample evidence that men value youth and physical attractiveness in women and women value wealth and status in men, and that this is largely invariant both historically (Buss & Barnes 1986; Hill 1945; Hudson & Henze 1969; McGinnis 1958) and cross-culturally (Buss 1989, 1994:19-72). Men value young and physically attractive women because youth and physical attractiveness were reliable indicators of health and fecundity in the EEA, and women value wealth and status in men because resourceful men of high status

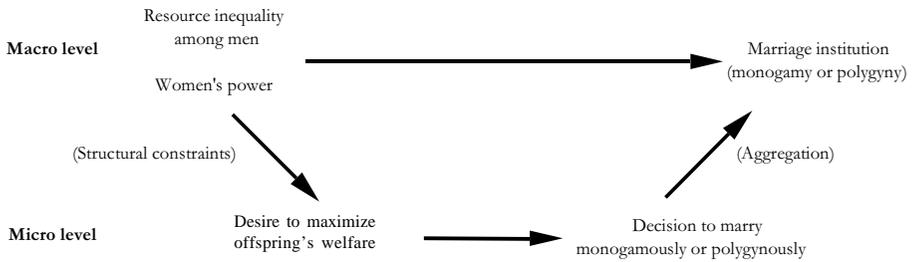
can better protect the women and their children and are better able to invest in the children than poor men of low status. Women in the EEA were typically unable to acquire and accumulate valued resources themselves and therefore needed resourceful men of high status to invest in their children. These evolutionary considerations (such as physical attractiveness and resources) serve as the ultimate causes, whose effects on behavior (mate selection) are mediated by proximate causes (love, desire, and other emotions). Humans believe that they are choosing to mate with the ones they love and desire, not the ones whose characteristics increase their reproductive success. Humans are not usually conscious of the evolutionary logic behind their emotions. The strength of evolutionary psychology is that it can predict from the ultimate causes whom humans are likely to love and find desirable.

Earlier theories of marriage institution (Alexander 1987; Alexander et al. 1979; Betzig 1986; MacDonald 1990) assume that men's preferences and choices create a particular institution and impose it on women. Kanazawa and Still (1999) first point out that mating is a female choice in every species in which the female makes greater parental investment in the offspring than the male (including humans), and then propose a theory that assumes that a particular institution of marriage spontaneously emerges out of thousands or millions of independent decisions women make.

If women prefer to marry men with greater resources, then, in the absence of any institution of marriage in the form of laws and customs, women should choose to marry polygynously if the resource inequality among men is greater. This is because, under structural conditions where rich men are so much wealthier than poor men, it would be better for women to share a man with greater resources than to have exclusive access to a man with fewer resources. By the same token, women should choose to marry monogamously if the resource inequality among men is less. Under structural conditions where rich men are not that much richer than poor men, women are better off having exclusive access to poor men than sharing rich men.

Further, the effect of resource inequality among men on the marriage institution should be stronger to the extent that women have greater power to decide whom to marry. There should therefore be an interaction effect of resource inequality among men and women's power in society on the marriage institution. Kanazawa and Still (1999) test and support these two hypotheses with data collected from 127 nations and territories throughout the world. Societies are more likely to have the polygynous institution of marriage when resource inequality among men is greater, and this relationship is stronger to the extent that women have greater power to decide whom to marry.

Figure 3 represents Kanazawa and Still's (1999) female choice theory of the marriage institution in a micro-macro model of the Coleman Boat. At the macro level, the society has given levels of resource inequality among men and women's

FIGURE 3: Micro-Macro Model of Marriage Institution

power, both of which are exogenous to the model. These macro structural factors set constraints within which women must make their decisions. Women have the (evolutionarily given) desire to maximize their children's welfare, and choose to marry either monogamously or polygynously according to the societal conditions (set by the two exogenous macro factors). Separate and independent individual decisions of thousands or millions of women to marry either monogamously or polygynously will aggregate at the societal level to a particular type of institution of marriage (monogamy or polygyny). Of course, once the institution is in place, it will independently affect the future marriage choices of women at time $t + 1$ in the Coleman Fleet. Kanazawa and Still's (1999) theory explains only the original emergence of the marriage institution and its gradual historical change.

This illustration underscores a few important points about the integration of evolutionary psychology into rational choice theory. First, even though the evolved psychological mechanism that produces the desire to maximize the welfare of children is universal among all women (and females of most other species), it interacts with structural constraints (the degree of resource inequality among men and women's power) to produce differential values and preferences (the desire to marry polygynously or monogamously) under different structural conditions. Second, while women's decision to marry polygynously or monogamously is consciously made, their desire to maximize the welfare of children is not consciously chosen. It derives from an evolved psychological mechanism. Third, this psychological mechanism (like any other psychological mechanism) evolved in the EEA and thus only "makes sense" and produces adaptive behavior in the EEA. This is why women's choice of a mate is still largely determined by the men's status and resources in every society even though, at least in the modern western societies, women can acquire resources themselves just as well as men can.

Current Explanations of Values and Preferences

In this section, I will discuss some of the general sociological explanations of individual values and preferences: Learning, norms, and identity. In each case, I will argue that the explanation provides *proximate* causes of behavior, which are consistent with the more *ultimate* explanation provided by evolutionary psychology. In other words, evolutionary psychology can explain *why* and *how* learning, norms and identity work the way they do to determine individual values and preferences. I will begin, however, with a specifically rational choice explanation of values and preferences provided by Lindenberg.

LINDENBERG'S SOCIAL PRODUCTION FUNCTION THEORY

Lindenberg (1992, 1996) explicitly recognizes, as I do, the need for a theory of values and preferences for rational choice theory. His social production function (SPF) theory combines the strengths of psychological theories and microeconomic household production theories and identifies a hierarchy of goals. At the top of the hierarchy are two universal goals that all humans pursue: *physical well-being* and *social well-being*. Below these universal goals, which are the ultimate ends in themselves, are five instrumental goals that actors pursue in order to achieve the two universal goals. Actors pursue *stimulation/activation* and *comfort* as instrumental means to physical well-being, and *status*, *behavioral confirmation*, and *affection* as instrumental means to social well-being. Below these first-order instrumental goals, Lindenberg identifies higher-order instrumental goals that actors pursue in order to achieve the first-order instrumental goals. For instance, actors pursue group membership and norm conformity as means to behavioral confirmation, which in itself is a means to social well-being. One of the strengths of Lindenberg's SPF theory is that he explicitly recognizes the possibility of substitution of instrumental goals. For instance, actors who cannot easily attain status as a means to social well-being (such as retired people) will instead pursue other means like affection from family members in order to achieve social well-being.

The SPF theory is an impressive theory of values and preferences, as well as one of the few available to complement rational choice theory. However, one must ask where the two ultimate universal goals come from. While the theory explains an entire hierarchy of values and preferences as means to these two ultimate goals, it nonetheless leaves unexplained why physical well-being and social well-being (and none other) are the two ultimate goals that all actors pursue. To his credit, Lindenberg recognizes the possible biological foundations for the two ultimate goals and how evolution by natural and sexual selection might have shaped them.

We did not address how SPF-theory relates to natural selection and genetics. . . . But it is not difficult to recognize the value of the first-order instrumental goals for what biologists call “inclusive fitness.” Their significance for reproduction is more easily seen for the goals of comfort and status, both have influenced reproductive opportunities of social animals including man, and they still do so. We think that the central assumption of SPF-theory — human beings seek to optimize physical and social well-being — is not incompatible with the natural selection and the notion of the selfish gene. . . . It is even likely that the tendency to optimize physical and social well-being results from selective pressures, and because of that probably has a genetic background. (Ormel et al. 1999:83-84)

I believe that not only is the SPF theory compatible with evolutionary psychology, the explicit incorporation of evolutionary psychology into the SPF theory will refine some of its predictions. For instance, evolutionary psychology would predict that, between the two first-order instrumental goals for physical well-being, activation/stimulation and comfort, the latter is more important than the former to the extent that the latter will facilitate survival more than the former. Further, evolutionary psychology would predict that status as an instrumental means to social well-being is far more important for men than for women to the extent that status increases men’s reproductive success far more than women’s. Finally, evolutionary psychology would strongly point to the possibility that physical well-being and social well-being are universal goals for all humans because they are in turn instrumental for survival and reproduction, the two ultimate goals of all biological organisms.

Evolutionary psychology can also solve some of the mysteries left unsolved by the SPF theory. For instance, Lindenberg (1992:52) states

In our society, it is still true that by and large women can produce income by either working or by being tied to a male partner (for making a home), and women can produce social approval either by their own occupational status or by being tied to a male partner (they get behavioral confirmation for making a home and raising children and they participate in the occupational status of their partner). For men, the situation is different.

Positing a single model for all actors, as does microeconomics in general, the SPF theory cannot explain this empirical observation. Recognizing unique natures for males and females, however, evolutionary psychology can explain why this phenomenon persists. I therefore believe that one of the most explicit theories of values and preferences currently available for rational choice theory can greatly benefit from the principles of evolutionary psychology.

LEARNING

Learning — past contingencies of reinforcement and punishment — can provide explanations of individual values and preferences. Actors will come to hold values and preferences that produce behavior for which they are repeatedly reinforced, and they will come to reject those that produce behavior for which they are repeatedly punished.

Macy's (1990, 1991a, 1991b, 1995) stochastic learning theory of collective action, and its application to the paradox of voter turnout (Kanazawa 1998, 2000), provide an example. Macy argues that actors take success or failure of collective action as reinforcer or punisher, respectively, for their individual behavior. If actors contribute toward collective action and the collective action succeeds, then their contribution is reinforced and they become more likely to contribute in the future. If actors contribute toward collective action and the collective action fails, then their contribution is punished and they become less likely to contribute (thus more likely to freeride) in the future. The same process of reinforcement and punishment occurs when individuals freeride. If the collective action succeeds, then their defection is reinforced and they become more likely to defect in the future. If the collective action fails, then their defection is punished and they become less likely to defect (thus more likely to contribute) in the future. A series of computer simulations (Macy 1990, 1991a, 1991b) and a laboratory experiment (Macy 1995) support his theory.

Kanazawa (1998, 2000) applies Macy's theory to the paradox of voter turnout. If citizens vote and their candidate of choice wins, then their voting is reinforced and they become more likely to vote in the future. If citizens vote and their candidate of choice loses, then their voting is punished and they become less likely to vote (thus more likely to abstain) in the future. The same process of reinforcement and punishment occurs when citizens abstain. If their candidate of choice wins, then their abstention is reinforced, and they become more likely to abstain in the future. If their candidate of choice loses, then their abstention is punished, and they become less likely to abstain (thus more likely to vote) in the future. Data from the American National Election Study (Kanazawa 1998) and from the General Social Survey (Kanazawa 2000) support his hypotheses. It therefore appears that citizens whose voting is reinforced and those whose abstention is punished acquire a preference for voting (which Riker & Ordeshook 1968 call "the sense of civic duty"). In contrast, citizens whose voting is punished and those whose abstention is reinforced acquire a preference for abstention (losing their sense of civic duty).

There is no question that learning is important in determining individuals' values and preferences. We all come to value doing things for which we have been rewarded in the past, and we all cease to value doing things for which we have been punished in the past. Further, since individual histories of reinforcement

contingencies vary, learning can explain heterogeneity in individual values. (Smith prefers to abstain because she voted for Bush in 1992 and Dole in 1996. Jones prefers to vote because she voted for Clinton in 1992 and 1996.) Even in this case, however, evolutionary psychology can provide more ultimate explanations of how learning works to provide proximate causes of behavior. In particular, evolutionary psychology can explain what stimuli are likely to function as reinforcers or punishers.

The definitions of reinforcer and punisher involve circularity (Catania 1973:40). "If a stimulus that follows an operant [voluntary response] causes an increase in the future frequency of the operant, the stimulus is a reinforcer. If a stimulus that follows an operant causes a decrease in the future frequency of the operant, the stimulus is a punisher" (Baldwin & Baldwin 1986:93). How then can we escape the circularity and know a priori which stimuli are reinforcers and which stimuli are punishers? No less an authority than Skinner (1969:206) himself provides the answer: "The capacity to be reinforced . . . must be traced to natural selection." Evolutionary psychology can explain why some stimuli function as reinforcers and why others function as punishers.

Recall the earlier example of our preferences for sweet and fatty foods. Why do we have these preferences? A perfect learning-theoretic answer is that we have been rewarded when we consume sweet and fatty foods (because they taste good and pleasurable) and we have been punished when we don't consume enough sweet and fatty foods (because we get a headache when our glucose level becomes too low). However, this explanation simply begs the question: Why do we experience the consumption of sugar and fat as rewarding, and not, say, the consumption of broccoli and brussels sprouts? Why do we not get a headache when our allylisothiocyanate (which is found in broccoli and brussels sprouts) level becomes too low?

A more ultimate, evolutionary psychological answer is that glucose and calories (both of which are found in abundance in sweet and fatty foods) solve the adaptive problems of survival and reproduction, while allylisothiocyanate doesn't. In fact, allylisothiocyanate in large quantities can be toxic, especially to children (Nesse & Williams 1994:81-90). This is why natural selection has equipped human brains with a taste for sugar and fat and a distaste for broccoli and Brussels spouts (especially among children, who usually outgrow their dislike of these vegetables as they grow older, when allylisothiocyanate ceases to be toxic to them). This is why sugar functions as a reinforcer, and broccoli functions (mostly) as a punisher.

Similarly, Macy's learning-theoretic solution to the problem of collective action and Kanazawa's learning-theoretic solution to the paradox of voter turnout beg the question: Why is it that Macy's actors take their collective action's success as a reinforcer and its failure as a punisher? Why is it that Kanazawa's citizens take their candidate's win as a reinforcer and his loss as a punisher? A moment's reflection

reveals that one person's contribution to a large N-person collective action (including large national elections) has an infinitesimal effect on its outcome. (Dole would have lost in 1996 whether or not Smith voted for him; Clinton would have won whether or not Jones voted for him.) One person's vote has virtually no effect on the outcome of large national elections. Why is it then that actors perceive a link between their behavior and the outcome of collective action and act as if their choice made a difference, by being reinforced by its success and punished by its failure?

Recall that our brain is biased to perceive and respond to the world as if it were the EEA. "Collective action" in the EEA involved at most 50-100 individuals. If Og says "Let's go to the mountains to hunt wild pigs" and Zod says "Let's go to the forest and hunt monkeys," and their band collectively decides to go to the mountains to hunt wild pigs, it is not unreasonable for Og to think that his vote had an effect on the collective decision, for two reasons. First, the group is small, and so each person in a 50-person band has a much larger share of the collective vote than a citizen in the U.S. presidential election. Second, "voting" (collective decision making) in the EEA did not involve secret ballots; everybody in the group knew how everybody else voted. So, unlike in modern elections, Og's and Zod's votes may not have been weighed equally. Thus Og has all the (rational) reasons to believe that his vote has an influence on the collective outcome, and he should continue trying to influence the group decision. Conversely, Zod has all the (rational) reasons to believe that his vote does not carry weight in his group, and he should perhaps cease trying to influence the group decision.

This is admittedly highly speculative. However, evolutionary psychology can provide at least one possible explanation of why the success of collective action serves as a reinforcer and why its failure serves as a punisher, which otherwise remains perplexing. My contention is that the human brain (adapted to the EEA) conceives of collective action, and responds to its outcomes, as if it involves only dozens of people (none of whose choices are anonymous), even when it in fact involves millions of people (whose choices are completely anonymous).

NORMS

Another traditional explanation of individual values and preferences in sociology is the social norms. Norms prescribe certain behaviors and proscribe others. They are also accompanied by sanctions; individuals who do not comply with norms are negatively sanctioned. Over time, perhaps through stochastic learning by which they are reinforced for compliance and punished for noncompliance, individuals come to internalize the norms. Once internalized, the norms guide behavior independent of sanctions; in essence, the internalized norms become the actors' own values and preferences. Although rational choice theorists might be loathe to admit it, individuals do internalize social norms (Scott 1971). Norm compliance

is too prevalent to be accounted for entirely by sanctions. Most of us do stop at the proverbial stop sign in the middle of nowhere at 3:00 A.M. when there are no police around.

There is no question that internalized norms influence behavior and can become individuals' own values and norms. While learning might account for the individual heterogeneity in values and preferences, norms can simultaneously account for their within-group homogeneity and between-group heterogeneity. Social norms as sources of values and preferences, however, once again beg the question: Where do norms come from? Yet again, evolutionary psychology can provide a more ultimate explanation for the emergence of norms (Kanazawa & Still 2001), which could then function as more proximate causes of behavior.

Cosmides and Tooby's (1992) work on cooperative food sharing and their notion of evoked culture provide an example of an evolutionary psychological theory of the emergence of norms. *Evoked culture* refers to differences between groups that are triggered by local circumstances. They are varied manifestations of universal psychological mechanisms due to varied environmental conditions. They result from the *interaction* of universal human nature and local environments.

One of the psychological mechanisms that humans (and other species) possess is reciprocal altruism (Trivers 1971). This psychological mechanism compels us to help each other in times of need. It also makes us *expect* reciprocity in exchange. When we help our neighbors in their times of need, we expect them to help us in our times of need. This psychological mechanism is the reason simultaneously why we get angry at those who do not reciprocate our favors, and why we feel guilty when we fail to reciprocate others' favors to us. We have been selected to possess this psychological mechanism because, given the uncertainty in our environment, those who possess it and help each other can better survive than those who don't. Species as primitive as vampire bats also engage in reciprocal altruism as humans do (Wilkinson 1984).

Cosmides and Tooby (1992) note that the local environmental condition that triggers the norms of cooperative food sharing is the high variance in food resources and availability. When the variance is high (as it is for large game hunting), on any given day some individuals procure more food than they can consume while others procure nothing. High variance also creates uncertainty, because whether one can procure food on any given day largely depends on luck. Under such conditions, the universal psychological mechanism of reciprocal altruism is triggered, and the norms of cooperative food sharing emerge at the macro level. In these cultures, there are strong negative sanctions against those who do not share their food with the less fortunate. When the variance is low (as in food gathering), the norms of cooperative food gathering do not develop because the amount of food one procures in these situations is largely proportional to one's effort.

As within-group evidence of this mechanism, Cosmides and Tooby (1992) note that the Ache of Paraguay have the norms of sharing meat communally (since meat

is a high-variance food). However, within the same tribe, gathered plant food is not shared outside of the nuclear family (since nuts and berries are low-variance food). As between-group evidence of the same mechanism, Cosmides and Tooby (1992) cite Cashdan's (1989) work on the Kalahari San. She notes that the !Kung San face extreme variability in the availability of food and water, whereas the //Gana San manage to keep the variance low through horticulture and goat husbandry. As predicted by Cosmides and Tooby's theory, the !Kung San have developed norms of cooperative food sharing, while the //Gana San have not.

Cosmides and Tooby's (1992) work on evoked culture illuminates one crucial characteristic of the evolutionary psychological perspective on the emergence of norms in particular and its explanation of individual values and preferences in general. The perspective, relying as it does on the evolved psychological mechanisms and universal human nature, can explain the cross-cultural universality of norms very well. It addresses the question of why all societies have certain important norms in common (such as norms prescribing cooperation or proscribing incest). However, by taking the local environment into consideration, it can also explain why certain norms emerge in some societies but not in others. Evolutionary psychology's reliance on the universal human nature and evolved psychological mechanisms decidedly does *not* mean that it predicts the emergence of the same norms everywhere. Kanazawa and Still's (1999) analysis of the emergence of marriage institutions discussed above provides another example of how the interaction between the universal human nature and the differential structural conditions lead to the emergence of divergent norms in different societies.

Yamagishi's work on generalized exchange and reciprocity nicely illustrates Cosmides and Tooby's theory of evoked culture. In contrast to restricted exchange, where what *A* gives *B* is directly contingent on what *A* receives from *B*, generalized exchange happens when what *A* gives *B* is not directly contingent on what *A* receives from *B* (Ekeh 1974). Helping a stranded driver on a mountain road is an example of generalized exchange (Yamagishi & Cook 1993). When one helps a stranded driver, the help is usually not repaid by the same driver. The helper, however, may receive help from someone else in the event of future car trouble. The norms prescribing mutual help, when strictly enforced, clearly result in Pareto-optimal outcomes, because everybody benefits from such generalized exchange.

The problem with generalized exchange, however, is that it is possible for actors to freeride, because the benefit an actor receives is not directly contingent on the resources she provides another; it is possible for her to receive benefits without providing anything in exchange. The system of generalized exchange has the incentive structure of social dilemmas, and it is therefore rational for actors to freeride. If everybody freerides, however, the system cannot be sustained and will eventually collapse. The only way a system of generalized exchange (and the norms

prescribing such behavior) can function is if actors are assured that others will not freeride.

Yamagishi (2000) proposes the concept of *assurance* to describe the extent to which actors can expect others to cooperate (by, for instance, engaging in the generalized exchange of mutual help) because the incentive structure is such that it is not in any actor's self-interest to defect. Unlike trustworthiness, assurance is not a quality of individuals, but of social institutions. When the institutional environment provides assurance, actors can contribute to the system of generalized exchange, secure in the knowledge that she will receive resources from others in the future.

Yamagishi argues that a high degree of assurance exists within Japanese social groups because it is not in any Japanese group member's interest to freeride, and such assurance is conducive to the norms of generalized exchange to emerge. The Japanese can feel safe in engaging in generalized exchange as long as they know that the institutional mechanisms are in place to curb freeriding (Yamagishi 1988) and thus to provide assurance. In Yamagishi's theory, the evolved psychological mechanism of reciprocal altruism interacts with the institutional environment (the degree of assurance) to produce the norms of generalized exchange, which prescribe cooperation with fellow group members. The same norms would not emerge if the institutional environment did not provide assurance. Yamagishi's norms of generalized exchange and reciprocity is therefore an instance of Cosmides and Tooby's (1992) evoked culture.

IDENTITY

Finally, social identity provides yet another traditional sociological explanation for values and preferences. Individuals derive their identity, as well as associated values and preferences, from their important reference groups, and their identity influences their behavior. We would therefore expect, and usually find, for instance, that Irish Catholics hold values and preferences distinct from black Muslims or East European Jews. We also expect, and usually find, that Irish Catholics behave differently from black Muslims and East European Jews. In general, people behave more favorably toward members of their own group than toward members of other groups.

One of the most powerful demonstrations of how group identity matters for individual behavior comes from a series of laboratory experiments in the "minimal group paradigm" of the social identity theory (Tajfel et al. 1971) and the self-categorization theory (Turner 1987). The experiments in this tradition have repeatedly demonstrated that the subjects treat fellow members of their group more favorably (by, for instance, giving more points to them or cooperating with them more frequently in Prisoner's Dilemma games) than members of another group,

even when the group membership is arbitrary in reality (by random assignment) and when the supposed criterion for membership is something as trivial and minimal as the tendency to overestimate or underestimate the number of dots on the screen or the preference for Klee's or Kandinsky's paintings. While Yamagishi, Jin, and Kiyonari (1999: experiment 5) discover that this ingroup favoritism disappears once the subjects' expectations of reciprocity is statistically controlled, most subjects nonetheless do expect such reciprocity and therefore do cooperate more and act more favorably toward fellow members in the minimal groups.

While a large amount of experimental evidence and the prevalence of ethnic and religious collective action throughout the world leave very little doubt that individuals' identity powerfully determines their values and preferences and influence their behavior, social identity as a source of values and preferences once again begs the question: Why is social identity important? Why do people derive their identity (and hence their values and preferences) from their groups? And from which groups (among the many to which they belong) are they more likely to derive their identity? I believe evolutionary psychology once again can provide a more ultimate explanation for why and how social identity influences individual values and preferences.

I begin with two observations. First, most people derive their identities from groups they are born into. Very few people born Irish Catholic later develop an identity as an East European Jew. Most people simply adopt the identity they are born into without questioning. Second, while individuals can simultaneously belong to a large number of groups, those that are important for their identities are usually "primordial" ones, based on race, ethnicity, culture, language, religion, and the like. For most people, their identities based upon these primordial criteria are more important than their identities based on their occupation, class, hobby, or political ideology. Why should this be the case? And what does "primordial" mean anyway?

Whitmeyer (1997) provides an evolutionary psychological theory of ethnic collective action. His mathematical model demonstrates that it is evolutionarily rational for actors to help possible coprogenitors of their descendants. Even though rational choice theory predicts that, from the *actor's* perspective, it is not rational to contribute toward collective action, Whitmeyer's model shows that, from the *gene's* perspective, it is rational to help others whom one might marry, or whose children one's children might marry, or whose grandchildren one's grandchildren might marry, etc. in the future. We have therefore been selected to possess psychological mechanisms that unconsciously compel us to help possible coprogenitors. Whitmeyer's model mathematically proves the evolutionary basis for collective action within the minimum endogamous set.

Not only does Whitmeyer's evolutionary psychological model show why it is evolutionarily rational for people to derive their identities from their groups and behave in ways to help other members of the groups, it also explains from which groups people are likely to derive their identities. People are more likely to derive

their identities from the endogamous group, and they are less likely to derive their identities from exogamous groups. This is why people's identities are more often based on ethnicity and religion, and less often on class and occupation (unless these are strictly endogamous, as in the Indian caste system). In societies where people are ethnically endogamous but religiously exogamous, people would be more likely to hold ethnic identities and behave in ways that favor fellow members of ethnic groups than to do the same for their religious groups. One would predict the opposite in societies where people are religiously endogamous but ethnically exogamous. Evolutionary psychology, such as Whitmeyer's mathematical model, explains both why people derive their identities from their groups and from which groups they are likely to do so.

Four Conundrums of Rational Choice Theory

I believe that the introduction of evolutionary psychology into rational choice theory not only solves the problem of values by providing an endogenous theory of the origins of values and preferences, but also solves some of the persistent puzzles about rational choice theory: Why do players in one-shot Prisoner's Dilemma games cooperate? Why do people participate in collective action (rather than freeride)? Why do people sometimes behave "irrationally" by acting on their emotions? Why does rational choice theory appear more applicable to men than to women?

WHY DO PEOPLE COOPERATE IN ONE-SHOT PRISONER'S DILEMMA GAMES?

Noncooperative game theory, which forms some of the microfoundations of rational choice theory, predicts that rational actors in one-shot or finitely iterated Prisoner's Dilemma games always defect. Defection is the dominant strategy in such games (in that a player can earn higher points by defecting no matter what choice the other player makes) and mutual defection is the Nash equilibrium (in that there is no incentive for rational players to change their strategy from defection to cooperation given the other player's choice). Yet in laboratory experiments, nearly half of all human subjects playing one-shot Prisoner's Dilemma games against each other make the irrational choice to cooperate (Sally 1995). Why so many people cooperate in Prisoner's Dilemma and other social dilemmas is one of the persistent puzzles of rational choice theory.

One crucial defining characteristic of one-shot Prisoner's Dilemma games in laboratory experiments is that the two players are anonymous. This complete anonymity prevents either player from retaliating against the other's defection, and thereby makes the payoffs from the game the only considerations in making one choice or the other in the game. It is only with the assumption that Player *B* cannot

retaliate against Player A (because Player B doesn't know who Player A is) that it becomes rational for Player A to defect on Player B.

Recall that the human brain and its evolved psychological mechanisms are biased toward viewing and responding to the world as if it were still the EEA. One of the things that did not exist in the EEA was complete anonymity. All interactions and exchanges in the EEA were face-to-face, and there were no anonymous interactions through computer terminals in a laboratory. So, even though complete anonymity is guaranteed by the experimental design, human subjects still behave as if they were not anonymous in the experiment and their exchange partners would know who they were and retaliate against their defection, just as they still act as if poisonous snakes and spiders were serious threats to their survival.³

This also explains why one of the factors that most strongly increases the rates of cooperation in Prisoner's Dilemma games is pregame communication (Dawes 1980:185-86; Sally 1995): When players are allowed to communicate with each other before the game, their rates of cooperation increase (even though they cannot make any binding commitment to cooperate or to punish defectors). While this is one of the most robust findings in the experimental literature on social dilemmas, nobody seems to know for sure why pregame communication increases cooperation (Kollock 1998:194). I believe that pregame communication increases cooperation because it reinforces the perception that the actors are not anonymous and retaliation is therefore possible, despite their clear, conscious cognition to the contrary. The pregame communication allows the human brain's innate bias to dominate the conscious cognition even further.⁴ In this context, it is important to note that only *face-to-face* pregame communication increases the rates of cooperation; pregame communication *via computers* does not (Ostrom 1998:6-7). This is probably because communication via computers (which did not exist in the EEA) does not unconsciously reinforce subjects' perception that other subjects are people they know.

This explanation for "irrational" cooperation in one-shot Prisoner's Dilemma games raises an inevitable question: Why then do the other half of the experimental subjects defect? I believe this is because these subjects are able to overcome the innate bias to perceive and respond to the world as if it were still the EEA, which is difficult but not impossible to do. The important question for behavioral sciences is not why the human brain works as it is supposed to, by digesting the relevant information and arriving at the correct conclusion. The important question instead is why it sometimes fails to do so. To recall an earlier example, the empirical puzzle is not why some of us can comprehend the deleterious effects of consuming too many sweets and fats and overcome our urge. We already know why we can understand the nutritional information printed on the candy bar and its health consequences. The puzzle instead is why, despite the clear understanding of the information, some of us still overconsume candy bars and get fat when we clearly

don't want to. Similarly, the puzzle is not why half the experimental subjects can comprehend the experimental instructions and arrive at the rational conclusion to defect. The real puzzle is why the other half cannot. Evolutionary psychology and its notion of a content-rich and biased human brain can solve that puzzle.

WHY DO PEOPLE PARTICIPATE IN COLLECTIVE ACTION?

Collective action is a process in which a large number of individuals contribute toward the production and provision of public goods. Public goods, by definition, are nonexcludable and nonrival. Once provided, all individuals can consume the public good regardless of whether they have contributed toward its provision; no one can be excluded from the consumption of public goods. Therein lies probably the greatest paradox of rational choice theory. Why do individuals expend their time and resources to contribute toward the provision of public goods, if no one can subsequently be excluded from their consumption?

For instance, why do thousands of people participate in political rallies and protests, potentially risking physical harm, arrest, or even death in the process, if those who are safely sitting at home, watching the event on TV, cannot be excluded from the benefit of the political and social change that the participants aim to bring about? This is especially puzzling in that one person's contribution to a large-scale social movement makes virtually no difference to the outcome. If the social movement is going to succeed, it is going to succeed without your participation, and you get to enjoy the benefit of the social change even though you did not contribute to it. If the social movement is going to fail, it is going to fail even with your participation, and all your time and effort will have been wasted. Why bother, then?⁵

Olson (1965) was the first to point out this freerider problem. He argued that self-interested, rational individuals would not voluntarily contribute toward the production of nonexcludable public goods; they would instead freeride on the contributions of others. If all individuals are rational, however, no one will contribute and the public good will not be provided. Olson's solution to the freerider problem was the provision of *selective incentives*. If the group provides some (excludable) private goods as a reward *only* to contributors but not to noncontributors, and if individuals sufficiently value these selective incentives, then the group can induce the individuals to contribute toward the provision of public goods.

Frohlich and Oppenheimer (1970:120) have later shown Olson's theoretical solution to the collective action problem to be logically flawed, however. Selective incentives to encourage contribution toward the public goods are themselves public goods that must be produced and paid for. (PBS stations can give tote bags to listeners or viewers who call in to pledge their financial contributions, but where do they get the money to buy the tote bags in the first place?) The Olsonian solution

to the collective action problem through the use of selective incentives therefore assumes a *prior* solution of the problem and merely regresses the theoretical problem. Note, however, that Frohlich and Oppenheimer's critique of Olson is valid only if the selective incentives are costly to produce. *If selective incentives are costless, then the collective action problem is solvable.* Evolutionary psychology suggests one such costless selective incentive for participation in some forms of collective action: social movements and political protests.

To my knowledge, Miller (1996) is the first to suggest that young men and women might possibly participate in political protests and other social movements because they are unconsciously motivated to seek reproductive opportunities. Miller recounts his observation as an undergraduate student at Columbia University in 1986, during the divestment movement against South African apartheid. He notes that the political commitment of the protesters appeared "paper thin" and the takeover of the administration building ended conveniently in time to study for the semester exams, but everybody he knew was dating someone they met during the protest rally. While the protest movement itself was short-lived, the sexual relationships among the protesters sometimes lasted for years. Goodwin (1997) also stresses the importance of unconscious reproductive motives to account for both the successes and failures of social movements and calls for social movement researchers to "return to the repressed."

During most of their evolutionary history, humans were mildly polygynous (Alexander et al. 1979). In a polygynous mating system, some males monopolize all females, and others are left out of mating altogether. Since women prefer men with higher status and greater resources, and since it takes time for men to accumulate resources and ascend the status hierarchy, in polygynous societies the older men usually monopolize the women, and the younger men do not get to mate until they are old enough to have accumulated sufficient resources. In a gerontocracy, young men are often the losers in the competition for the reproductive resources that women offer them.

The only way for young men to gain access to women's reproductive resources is to *change the system*. Just as later-borns within a family have an interest in changing the status quo, in which the first-borns monopolize parents' attention and resources, and later-borns therefore turn out to be more liberal and rebellious against the system (Sulloway 1996), young men in society have an interest in changing a status quo in which older men monopolize both the material and reproductive resources. In sharp contrast, just as firstborns within a family have an interest in maintaining the status quo, in which they enjoy the benefit of their high status (Sulloway 1996), older men in society have an interest in maintaining the status quo, in which they monopolize the material and reproductive resources. Young men are the later-borns of society and older men are the first-borns. This is probably why young men in

all societies are more liberal and rebellious and older men are more conservative, or why rebellious young men become more conservative as they get older.

All social movements seek to change some status quo. They therefore provide opportunities for young men to distinguish themselves and demonstrate to young women that they can change the system and overthrow the older men's monopoly of resources. Participation in social movements therefore becomes an instance of "cultural display" for the young men (Miller 1999) in which they engage in conspicuous behavior (such as producing music, art, and literature) for the unconscious purpose of attracting women. Social movements also provide opportunities for young women to discern and evaluate who might become the next generation of leaders to displace the status quo and acquire status and resources in the next system. Social movements and political protests therefore provide ideal opportunities for courtship.⁶

In his study of the participants of the Freedom Summer, McAdam (1988) notes widespread sexual activities among them. "During interviews at least six of the former volunteers acknowledged a high frequency of sexual behavior on their projects" (297, n. 46). Similarly, Harris (1982:67) states: "Among other things, being on the battlefield together led to a level of heterosexual experimentation unavailable in the more regulated college circles from which the COFO [Council of Federated Organizations] workers hailed." In their survey of college students during the 1960s, Lipset and Schaflander (1971:282-306) claim that SDS members and others identified with the New Left had a far more casual sex partners than politically uninvolved students that the authors call "marginal ambivalents." A prominent draft-resistance poster from the 1960s proclaimed "Girls Say Yes to Boys Who Say No" (Stolley 1998:128).

If young men and women participate in social movement activities because they are unconsciously motivated to seek reproductive opportunities, then the theoretical paradox of the collective action problem can be solved. *For men and women themselves serve as costless selective incentives to each other, which are unavailable to freeriders.* Of course, seeking reproductive opportunities only serves as the ultimate (evolutionary) cause of social movement participation, *of which the participants themselves are largely unaware.* The proximate (psychological) causes of participation include genuine commitment to the movement's political cause and a strong desire to bring about social change.

WHY DO PEOPLE SOMETIMES BEHAVE "IRRATIONALLY" BY ACTING ON THEIR EMOTIONS?

One of the persistent criticisms of rational choice theory is that it disregards the role of emotions in human behavior (Scheff 1992). While rational choice theorists themselves recognize the need to incorporate emotions in their explanations of

human behavior (Heckathorn 1993), full integration of emotions into rational choice theory has yet to come.

Frank (1988, 1993) is the first to recognize the strategic role of emotions in human behavior. He argues that emotions allow us to solve the "commitment problem." Sometimes a choice that maximizes our short-term interests does not maximize our long-term interests. For example, retaliation is often costly, and it is cheaper in the short run to let go of others' defection; it usually carries a personal price to retaliate. However, if we consistently retaliate against defectors, we create the reputation of someone "not to be messed with." This reputation prevents future defection by others and maximizes our long-term self-interest. Frank argues that our anger, which we have been selected to exhibit against those who defect on us, impels us to retaliate against the defectors despite the short-term costs and serves our long-term interests.

Evolutionary psychology and its concept of psychological mechanism complement Frank's insight in two ways. First, the interests that emotions serve are those of the genes. Natural and sexual selections have equipped humans to have certain emotions because they serve genetic interest by increasing the inclusive fitness of those who possess them. Second, emotions have the same origins as values and preferences; they both come from evolved psychological mechanisms. Just as we have certain values and preferences but usually don't know why, we have certain emotions in certain predictable situations, but otherwise don't know why. Just as we don't choose or decide to have our values and preferences, we don't choose or decide to have our emotions. All the "thinking" has already been done by evolution, which equips us with appropriate preferences and emotions to maximize our survival and reproductive success.

Recall the earlier discussion of cooperation in one-shot Prisoner's Dilemma games. I have argued above that individuals cooperate in such games because their brain is biased to perceive the world as the EEA, where there was no complete anonymity and retaliation against defection was always possible. Thus those who defected in the EEA probably did not do better than those who cooperated. The defectors incurred the wrath of their exchange partners and provoked retaliation from them. This is why evolution has equipped humans with a sense of guilt associated with defection, to prevent them from defecting on others and suffering the consequences (Nielsen 1994:291-92). Most of us do not defect on others because doing so makes us feel guilty.⁷ Emotions such as guilt therefore provide the proximate psychological causes of our behavior.

Heckathorn (1993:157) states that there are three ways to integrate emotions and rational choice: "Emotions can be derived from rational action; rationality can be viewed as deriving from emotion; or rational action and emotions can be linked to a deeper underlying process." I believe that Heckathorn's third choice is correct. I contend that the "deeper underlying process," from which both preferences

(an important ingredient of rational action, along with constraints) and emotions derive, are the evolved psychological mechanisms.

WHY DOES RATIONAL CHOICE THEORY APPEAR MORE APPLICABLE TO MEN THAN TO WOMEN?

Another persistent criticism of rational choice theory is that it is more applicable to male behavior than to female behavior (Ferber & Nelson 1993; Risman & Ferree 1995). England and Kilbourne (1990), for instance, launch a radical-cultural feminist critique of rational choice theory by maintaining that men and women are fundamentally different and that the assumptions of self-interest and rational behavior are more applicable to men than to women.

In principle, there is nothing androcentric about rational choice theory and its microfoundations. At the minimum, the “thin” rational choice model (Ferejohn 1991) simply states that actors do their best to pursue their goals within structural and institutional constraints. This statement applies equally well to men and women; women, just like men, attempt to maximize their utility within the constraints they face.

In practice, however, I believe England and Kilbourne (1990), and other radical-cultural feminist critics of rational choice theory, are correct. Because rational choice theory currently lacks a theory of values and preferences, and because rational choice theorists therefore do not know what idiosyncratic values actors hold, the typical strategy is to assume that actors hold certain common values (Hechter 1994). The typical value assumption is to postulate that actors attempt to maximize wealth, power, and status. Since wealth (and, to a lesser extent, power and status) are fungible goods, actors can use them to pursue idiosyncratic goals; no matter what idiosyncratic values and preferences actors hold, they should all prefer greater wealth, power, and status.

I believe it is this typical value assumption that makes rational choice theory more applicable to men than to women. Evolutionary psychology posits that the single-minded pursuit of wealth, power, and status is more characteristic of male human nature (and of male nature in other species) than of female human nature. Because women prefer to mate with men with greater resources, power, and status (Buss 1994:19-48), men have been selected to maximize wealth, power, and status. Thus men possess the psychological mechanisms that compel them to pursue the accumulation of wealth and the attainment of higher status and greater power in a social hierarchy. These values characterize women’s psychological mechanisms to a far lesser extent. Thus, by postulating the typical value assumptions of wealth, power, and status maximization, rational choice theorists are unwittingly making their theory more applicable to men than to women.

The radical-cultural feminist critique of rational choice theory sharply points to the need for a theory of values in rational choice theory, so that we could explain

and predict what men and women want, instead of assuming that both men and women want what only men typically do (or that they typically do to a far greater extent). Further, by explicating why men's psychological mechanisms might be different from women's, and thus by demonstrating how men and women are *essentially* different, evolutionary psychology provides theoretical and empirical support for radical-cultural feminism.

Conclusion

The microfoundations of rational choice theory explain individual behavior in terms of actors' values and preferences and the structural constraints they face. Rational choice theory can provide a methodologically individualist explanation of *any* social outcome, as long as the theorist can specify both the values and constraints *ex ante*. While constraints are observable, values and preferences are not and therefore impossible to measure independently (Hechter 1992, 1994). Therein also lies the danger of unfalsifiability in rational choice theory. The theorist can explain away any individual behavior (however bizarre and unusual) by positing unique (equally bizarre and unusual) preferences of actors *ex post*. The inability of rational choice theory to provide an endogenous theory of actors' values and preferences also makes it incomplete.

I propose a turn to evolutionary psychology, which is sweeping psychology and anthropology. Evolutionary psychology can provide a *theory of values*, which rational choice theorists can use to specify what values actors pursue (besides the standard fungible resources of wealth, status, and power). An earlier theory of values and preferences (Lindenberg 1992, 1996) is perfectly compatible with and logically deducible from evolutionary psychology, as Lindenberg himself recognizes (Ormel et al. 1999). I also argue that evolutionary psychology provides more ultimate explanations for traditional sociological explanations of values and preferences, such as learning, norms, and identity. Evolutionary psychology can explain why and how learning works by specifying *ex ante* what stimuli are likely to function as reinforcers and punishers; where norms come from (Kanazawa & Still 2000); and which norms are likely to emerge under what conditions (Cosmides & Tooby 1992); and why social identities are important and which identity people are likely to hold and why (Whitmeyer 1997).

Evolutionary psychology can also solve four empirical puzzles that rational choice theory has so far been unable to solve. First, evolutionary psychology points out that there was no total anonymity in the EEA (where cooperation was therefore rational), and explains why pregame communication increases cooperation in one-shot Prisoner's Dilemma games. Second, evolutionary psychology suggests that young men and women might participate in social movements and political protests in order unconsciously to seek reproductive opportunities, where participants

themselves become selective incentives for each other. Third, evolutionary psychology supports Frank's (1988, 1993) earlier work and points out that emotions help us solve the commitment problem by forcing us to make choices that maximize our genes' long-term interest. It also points out that values and emotions have the same underlying origins: evolved psychological mechanisms. Finally, evolutionary psychology can answer the feminist question of why men and women pursue different goals. It also agrees with the feminist critics that the standard value assumption (wealth, power, and status maximization) — which rational choice theorists have had to make in the absence of an explicit theory of values — is more applicable to men than to women.

Notes

1. Excellent introductions to evolutionary psychology include Barkow, Cosmides, and Tooby (1992), Buss (1994, 1995, 1999), Ridley (1993), and Wright (1994).

2. As a first approximation, it might be useful to think of the EEA as the African savanna during the Pleistocene epoch, because this is indeed where many psychological mechanisms evolved. Technically, however, the EEA “is not a place or a habitat, or even a time period. Rather, it is a statistical composite of the adaptation-relevant properties of the ancestral environments encountered by members of ancestral populations, weighted by their frequency and fitness-consequences” (Tooby & Cosmides 1990:386-87).

In other words, the EEA might be different for different adaptations. For instance, in order to pinpoint the EEA for our taste for sweets and fats as an adaptation, we need to consider the entire period of evolution from the time when we did not have this taste (probably long before we were human) until the time when all humans had this psychological mechanism. This is likely the period during which malnutrition was a particular problem for survival. Further, we must emphasize the period during which malnutrition was more prevalent (weight by frequency) and during which those with this taste for sweets and fats had particularly greater reproductive success than those without it (weight by fitness consequences).

3. An erection provides another example. The only biological function of an erection is to allow men to have intercourse with women. Yet today men have erections when they look at naked women in photographs or videos. This is probably because there were no pictures and videos in the EEA, where every image of a sexually responsive woman was a live woman and there was thus some possibility of copulation with her. It therefore paid (in terms of reproductive success) for men to have an erection to be ready for copulation every time they saw images of sexually responsive naked women. Men's brain today is biased to perceive and respond to the world as if it were still the EEA where there were no women in pictures and videos with whom they could never copulate.

4. Similarly, to continue the example of note 3, most men find erotic videos sexually more arousing than erotic photographs. This is probably because the moving pictures

and the sound (which more closely resemble real situations) unconsciously reinforce the bias in men's brain that naked women in the videos are real (and therefore available for copulation), just as communication reinforces the bias the subject is not anonymous and partners in Prisoner's Dilemma games can therefore retaliate against their defection.

5. One potential answer, of course, is Macy's stochastic learning model discussed above.

6. The singer-songwriter Annie Gallup perfectly captures my argument in her song "A Million Ways" (CD: *Courage My Love*). The song is about a female college student who falls in love with and starts dating the leader of an antiwar movement on campus. The relationship ends, however, when the war ends and the protest movement fizzles. Sometime later, she runs into him and learns that he is now dating a business law professor. She chastises her former boyfriend: "So that's how we're going to change the world? By joining forces with the oppressor?" His response is sober: "Hey, you can live in that little dream, with your naïve politics. My god, like it matters who got arrested for the cause of fearlessness in the face of the riot squad. As if all that soybean soup you ate at midnight, because it took that long to cook and it was cheap, ever fed a soul in Bangladesh or helped some guy in a foxhole sleep. I mean, pick a cause. *Any cause is going to work just as well if what you do it for is how it makes you feel about yourself*" (emphasis added). From my perspective, it is not so much how it makes men and women feel about themselves, but how it makes the women feel about the men.

7. Robyn M. Dawes (personal communication) tells a fascinating anecdote. In an early laboratory experiment on Prisoner's Dilemma, one of his subjects successfully defected and earned a lot of money in the experiment. The subject, however, was tormented by severe guilt that night and called Dawes's laboratory next morning and offered to return *three times* the amount of money he earned in the experiment. When Dawes's secretary declined to take back the money, the subject then asked the secretary to name a charity to which he could donate his earnings from the experiment. The subject told the secretary, "Most of all, I want you to know that I am not that sort of person [who would profit from defecting on others]." This subject, of course, did not know who the other subjects were and did not ever meet them.

References

- Alexander, Richard D. 1987. *The Biology of Moral Systems*. Aldine.
- Alexander, Richard D., John L. Hoogland, Richard D. Howard, Katharine M. Noonan, and Paul W. Sherman. 1979. "Sexual Dimorphisms and Breeding Systems in Pinnipeds, Ungulates, Primates and Humans." Pp. 402-35 in *Evolutionary Biology and Human Social Behavior: An Anthropological Perspective*, edited by Napoleon A. Chagnon and William Irons. Duxbury Press.
- Baldwin, John D., and Janice I. Baldwin. 1986. *Behavior Principles in Everyday Life*, 2d ed. Prentice-Hall.
- Barash, David P. 1982. *Sociobiology and Behavior*, 2d ed. Elsevier.
- Barkow, Jerome H., Leda Cosmides, and John Tooby (eds.). 1992. *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*. Oxford University Press.

- Becker, Gary S. 1996. *Accounting for Tastes*. Harvard University Press.
- Betzig, Laura L. 1986. *Despotism and Differential Reproduction: A Darwinian View of History*. Aldine.
- Bowlby, John. 1969. *Attachment and Loss*, vol. 1, *Attachment*. Basic Books.
- Browne, Irene, and Paula England. 1997. "Oppression from Within and Without in Sociological Theories: An Application to Gender." *Current Perspectives on Social Theory* 17: 77-104.
- Buss, David M. 1989. "Sex Differences in Human Mate Preferences: Evolutionary Hypotheses Tested in 37 Cultures." *Behavioral and Brain Sciences* 12:1-49.
- . 1994. *The Evolution of Desire: Strategies of Human Mating*. Basic Books.
- . 1995. "Evolutionary Psychology: A New Paradigm for Psychological Science." *Psychological Inquiry* 6:1-30.
- . 1999. *Evolutionary Psychology: The New Science of the Mind*. Allyn and Bacon.
- Buss, David M., and Michael Barnes. 1986. "Preferences in Human Mate Selection." *Journal of Personality and Social Psychology* 50:559-70.
- Cashdan, Elizabeth. 1989. "Hunters and Gatherers: Economic Behavior in Bands." Pp. 21-48 in *Economic Anthropology*, edited by Stuart Plattner. Stanford University Press.
- Catania, A. Charles. 1973. "The Nature of Learning." Pp. 31-68 in *The Study of Behavior: Learning, Motivation, Emotion, and Instinct*, edited by John A. Nevin and George S. Reynolds. Scott Foresman.
- Coleman, James S. 1990. *Foundations of Social Theory*. Harvard University Press.
- Cosmides, Leda, and John Tooby. 1992. "Cognitive Adaptations for Social Exchange." Pp. 163-228 in *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*, edited by Jerome H. Barkow, Leda Cosmides, and John Tooby. Oxford University Press.
- Dawes, Robyn M. 1980. "Social Dilemmas." *Annual Review of Psychology* 31:169-93.
- Ekeh, Peter P. 1974. *Social Exchange Theory: The Two Traditions*. Harvard University Press.
- Emerson, Richard M. 1987. "Toward a Theory of Value in Social Exchange." Pp. 11-46 in *Social Exchange Theory*, edited by Karen S. Cook. Sage Publications.
- England, Paula, and Irene Browne. 1992. "Internalization and Constraint in Theories of Women's Oppression." *Current Perspectives on Social Theory* 12:97-123.
- England, Paula, and Barbara Stanek Kilbourne. 1990. "Feminist Critique of the Separative Model of Self." *Rationality and Society* 2:156-71.
- Ferber, Marianne A., and Julie A. Nelson (eds.). 1993. *Beyond Economic Man: Feminist Theory and Economics*. University of Chicago Press.
- Ferejohn, John A. 1991. "Rationality and Interpretation: Parliamentary Elections in Early Stuart England." Pp. 279-305 in *The Economic Approach to Politics: A Critical Reassessment of the Theory of Rational Action*, edited by K.R. Monroe. HarperCollins.
- Frank, Robert H. 1988. *Passions within Reason: The Strategic Role of Emotions*. Norton.
- . 1993. "The Strategic Role of Emotions: Reconciling Over- and Undersocialized Accounts of Behavior." *Rationality and Society* 5:160-84.
- Frohlich, Norman, and Joe A. Oppenheimer. 1970. "I Get By with a Little Help from My Friends." *World Politics* 23:104-20.

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- Goodwin, Jeff. 1997. "The Libidinal Constitution of a High-Risk Social Movement: Affectual Ties and Solidarity in the Huk Rebellion, 1946 to 1954." *American Sociological Review* 62:53-69.
- Harris, David. 1982. *Dreams Die Hard: Three Men's Journey through the Sixties*. St. Martin's Press.
- Hechter, Michael. 1992. "Should Values Be Written Out of the Social Scientist's Lexicon?" *Sociological Theory* 10:214-30.
- . 1994. "The Role of Values in Rational Choice Theory." *Rationality and Society* 6:318-33.
- Hechter, Michael, and Satoshi Kanazawa. 1997. "Sociological Rational Choice Theory." *Annual Review of Sociology* 23:191-214.
- Hechter, Michael, Lynn Nadel, and Richard E. Michod. 1993. *The Origin of Values*. Aldine de Gruyter.
- Heckathorn, Douglas D. 1993. "Emotions and Rational Choice: Introduction." *Rationality and Society* 5:157-59.
- Hill, Reuben. 1945. "Campus Values in Mate Selection." *Journal of Home Economics* 37:554-58.
- Hudson, John W., and Lura F. Henze. 1969. "Campus Values in Mate Selection: A Replication." *Journal of Marriage and the Family* 31:772-75.
- Kanazawa, Satoshi. 1998. "A Possible Solution to the Paradox of Voter Turnout." *Journal of Politics* 60:974-95.
- . 2000. "A New Solution to the Collective Action Problem: The Paradox of Voter Turnout." *American Sociological Review* 65:433-42.
- Kanazawa, Satoshi, and Mary C. Still. 1999. "Why Monogamy?" *Social Forces* 78:25-50.
- . 2001. "The Emergence of Marriage Norms: An Evolutionary Psychological Perspective." Pp. 274-304 in *Social Norms*, edited by Michael Hechter and Karl-Dieter Opp. Russell Sage Foundation.
- Kollock, Peter. 1998. "Social Dilemmas: The Anatomy of Cooperation." *Annual Review of Sociology* 24:183-214.
- Lindenberg, Siegwart. 1992. "The Explanation of Preferences." Pp. 49-66 in *Empirische sociologie als opdracht*, edited by H. van Goor. MB-Boek.
- . 1996. "Continuities in the Theory of Social Production Functions." Pp. 169-84 in *Verklarende sociologie: Opstellen voor Reinhart Wippler*, edited by Siegwart Lindenberg and Harry Ganzeboom. Thesis.
- Lipset, Seymour Martin, and Gerald M. Schaflander. 1971. *Passion and Politics: Student Activism in America*. Little, Brown.
- MacDonald, Kevin. 1990. "Mechanisms of Sexual Egalitarianism in Western Europe." *Ethology and Sociobiology* 11:195-238.
- Macy, Michael W. 1990. "Learning Theory and the Logic of Critical Mass." *American Sociological Review* 55:809-26.
- . 1991a. "Learning to Cooperate: Stochastic and Tacit Collusion in Social Exchange." *American Journal of Sociology* 97:808-43.

- . 1991b. "Chains of Cooperation: Threshold Effects in Collective Action." *American Sociological Review* 56:730-47.
- . 1995. "PAVLOV and the Evolution of Cooperation: An Experimental Test." *Social Psychology Quarterly* 58:74-87.
- Maryanski, Alexandra, and Jonathan H. Turner. 1992. *The Social Cage: Human Nature and the Evolution of Society*. Stanford University Press.
- McAdam, Doug. 1988. *Freedom Summer*. Oxford University Press.
- McGinnis, Robert. 1958. "Campus Values in Mate Selection: A Repeat Study." *Social Forces* 36:368-73.
- Miller, Geoffrey F. 1996. "Political Peacocks." *Demos* 10:9-11.
- . 1999. "Sexual Selection for Cultural Displays." Pp. 71-91 in *The Evolution of Culture: An Interdisciplinary View*, edited by Robin Dunbar, Chris Knight, and Camilla Power. Rutgers University Press.
- Nesse, Randolph M., and George C. Williams. 1994. *Why We Get Sick: The New Science of Darwinian Medicine*. Vintage.
- Nielsen, François. 1994. "Sociobiology and Sociology." *Annual Review of Sociology* 20:267-303.
- Olson, Mancur. 1965. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Harvard University Press.
- Ormel, Johan, Siegwart Lindenberg, Nardi Steverink, and Lois M. Verbrugge. 1999. "Subjective Well-Being and Social Production Functions." *Social Indicators Research* 46:61-90.
- Ostrom, Elinor. 1998. "A Behavioral Approach to the Rational Choice Theory of Collective Action." *American Political Science Review* 92:1-22.
- Ridley, Matt. 1993. *The Red Queen: Sex and the Evolution of Human Nature*. Penguin.
- Riker, William H., and Peter C. Ordeshook. 1968. "A Theory of the Calculus of Voting." *American Political Science Review* 62:25-42.
- Risman, Barbara J., and Myra Marx Ferree. 1995. "Making Gender Visible: Comment on Coleman." *American Sociological Review* 60:775-82.
- Sally, David. 1995. "Conversation and Cooperation in Social Dilemmas: A Meta-Analysis of Experiments from 1958 to 1992." *Rationality and Society* 7:58-92.
- Scheff, Thomas J. 1992. "Rationality and Emotion: Homage to Norbert Elias." Pp. 101-19 in *Rational Choice Theory: Advocacy and Critique*, edited by James S. Coleman and Thomas J. Fararo. Sage Publications.
- Scott, John Finley. 1971. *Internalization of Norms: A Sociological Theory of Moral Commitment*. Prentice-Hall.
- Skinner, B. F. 1969. *Contingencies of Reinforcement*. Appleton-Century-Crofts.
- Stigler, George J., and Gary S. Becker. 1977. "De Gustibus Non Est Disputandum." *American Economic Review* 67:76-90.
- Stolley, Richard B. 1998. *Turbulent Years: The 60s*. Time-Life.
- Sulloway, Frank J. 1996. *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives*. Pantheon.

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- Tajfel, Henri, M. G. Billig, R. P. Bundy, and Claude Flament. 1971. "Social Categorization and Intergroup Behaviour." *European Journal of Social Psychology* 1:149-78.
- Tooby, John, and Leda Cosmides. 1989. "Evolutionary Psychology and the Generation of Culture, Part 1: Theoretical Considerations." *Ethology and Sociobiology* 10:29-49.
- . 1990. "The Past Explains the Present: Emotional Adaptations and the Structure of Ancestral Environments." *Ethology and Sociobiology* 11:375-424.
- Trivers, Robert L. 1971. "The Evolution of Reciprocal Altruism." *Quarterly Review of Biology* 46:35-57.
- Turner, John C. 1987. *Rediscovering the Social Group: A Self-Categorization Theory*. Basil Blackwell.
- van den Berghe, Pierre L. 1990. "From the Popocatepetl to the Limpopo." Pp. 410-31 in *Authors of Their Own Lives: Intellectual Autobiographies by Twenty American Sociologists*, edited by Bennett M. Berger. University of California Press.
- Whitmeyer, Joseph M. 1997. "Endogamy As a Basis for Ethnic Behavior." *Sociological Theory* 15:162-78.
- Wilkinson, Gerald S. 1984. "Reciprocal Food Sharing in the Vampire Bats." *Nature* 308:181-84.
- Wright, Robert. 1994. *The Moral Animal: The New Science of Evolutionary Psychology*. Vintage.
- Yamagishi, Toshio. 1988. "The Provision of a Sanctioning System in the United States and Japan." *Social Psychology Quarterly* 51:265-71.
- . 2000. *Trust: The Evolutionary Game of Mind and Society*. Westview Press.
- Yamagishi, Toshio, and Karen S. Cook. 1993. "Generalized Exchange and Social Dilemmas." *Social Psychology Quarterly* 56:235-248.
- Yamagishi, Toshio, Nobuhito Jin, and Tohko Kiyonari. 1999. "Bounded Generalized Reciprocity: Ingroup Boasting and Ingroup Favoritism." *Advances in Group Processes* 16:161-97.